Aging Clin Exp Res
https://doi.org/10.1007/s40520-024-02766-y

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024)

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): Plenary Lectures Abstracts

PL1
FRACTURE PREVENTION: TIME TO MOVE BEYOND THE PRIMARY/SECONDARY DICHOTOMY?

E. V. McCloskey[1]

[1]Division of Clinical Medicine, School of Medicine and Population Health, Mellanby Centre for Musculoskeletal Research, University of Sheffield., Sheffield, United Kingdom

Primary prevention refers to actions aimed at avoiding the manifestation of a disease, including actions to modify behavioural and medical health risks (e.g. nutritional and activity interventions or use of vaccinations if appropriate). Secondary prevention deals with early detection of disease and interventions to deliver positive health outcomes (e.g. a reduction in risk of disease progression). The clinical management of chronic non-communicable diseases has frequently been separated into primary and secondary prevention. Secondary prevention is widely accepted, if not implemented, within clinical care—an event has happened that is often easily recognisable, usually if not always ensuring the presentation of the patient to a care provider and, finally, is seen to trigger a management pathway of investigation and treatment. This is often seen as the 'low hanging fruit' in medical care, but its implementation is often far from optimal as evidenced by a large and persisting treatment gap even in those with fracture.

The other concept of primary and secondary reflects the setting of the care provider; provision of event detection and management in primary care (GP, family physician, community settings) or in secondary care (hospital, specialist clinic etc). Events, by their nature, often lead to secondary care investigation and management with care in the immediate aftermath of the event often driven by established clinical protocols. However, the long-term care and management is then often transferred back to primary care; the latter requires excellent communication, education and understanding of the treatment goals so that long-term measures are provided and monitored to ensure the best possible outcome in individual patients.

Finally, the delineation of primary and secondary prevention is not totally an event driven phenomenon. While primary prevention is driven by the awareness of an increased risk in an individual prior to the event, the likelihood of an event in any individual, even in those with a first event, can vary markedly depending on the co-existence of other health conditions and risk factors. In this concept, the event can be seen as yet another risk factor to be considered, and rather than an automatic trigger for treatment should be seen as a trigger for risk assessment with subsequent treatment driven by the risk of future event. These different concepts will be addressed in this presentation.

PL2
OPTIMIZATION OF LIFELONG OSTEOPOROSIS MANAGEMENT

M. McClung[1]

[1]Oregon Osteoporosis Center, Portland, United States

Osteoporosis is a chronic condition requiring long-term, even lifelong therapy. Different strategies are appropriate at different stages of life and for different levels of fracture risk. During years of skeletal growth, being healthy with good nutrition and regular physical activity are important to optimize peak bone mass as is achieving normal puberty during adolescence. Identifying women at high risk for osteoporosis at the time of menopause provides the opportunity to prevent the rapid loss of bone mass and deterioration of skeletal microarchitecture that occurs at that time, thereby preventing postmenopausal osteoporosis. For patients with osteoporosis, general measures (good nutrition, maintaining strength and balance and fall prevention) are important but not sufficient to reduce fracture risk. Optimal therapy for patients who have already developed osteoporosis begins with an osteoanabolic agent to restore skeletal structure, followed by an anti-remodeling drug to maintain that benefit. Once a patient has achieved maximal benefit from therapy, intermittent bisphosphonate "maintenance" therapy is appropriate for long-term management. Optimization of skeletal health over the lifespan is an important consideration for all persons.

Published online: 20 August 2024

PL3
UNRAVELING THE VITAMIN D MEGATRIAL CONUNDRUM

B. Dawson-Hughes[1]

[1]Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, United States

By now, it is generally recognized that the recent vitamin D mega-trials were null with respect to the effect of vitamin D supplementation on risk of falls and fractures. Most of these trials were planned and implemented concurrently and consequently did not "learn from one another". This presentation will address what we have learned and focus on the relevance of the megatrial findings to the global community. The context in which the trials were conducted—including the baseline 25-hydroxyvitain D [25(OH)D] levels of participants, their self-selected calcium intake, and the amounts of personal vitamin D and calcium supplements that participants were allowed to take during the mega-trials—will be considered.

In an early study, the landmark Chapuy trial published in 1992, the combination of daily vitamin D (800 IU) supplementation and calcium (1200 mg) supplementation in 3270 elderly, vitamin D- and calcium-deficient female nursing home residents dramatically reduced risk of hip fractures by 43% and other non-vertebral fractures by 32%. Smaller studies conducted soon thereafter identified a reduced risk of fractures in community dwelling older men and women who were not taking supplemental calcium or vitamin D. These studies were conducted before supplementation with vitamin D became the norm in the US. Supplementation was also occurring in other regions where megatrials were performed, as evidenced by the substantial baseline 25(OH)D levels in these trials. Additionally, calcium intake had been boosted by expanded food fortification in the US during the tenure of the VITAL mega-trial.

Nutrient intake has a distinctive relationship to function wherein inadequate intake impairs function, there is an optimal intake range in which function is maximal, and excess intake impairs function. The boundaries of the optimal 25(OH)D range for vitamin D are not precisely defined. The lower boundary for 25(OH)D appears to be around 20 ng/ml (50 nmol/L). The upper boundary is less clear although there is evidence that in may be in the range of 25(OH)D levels of 40–60 ng/ml. This concept is important to consider when choosing supplement doses and designing food fortification programs. Context is critically important as regions around the globe consider whether supplementation with vitamin D alone or in combination with calcium would be beneficial. We will review the 25(OH)D levels and calcium intake in different countries and regions compiled by the International Osteoporosis Foundation and consider strategies to optimize vitamin D and calcium intakes globally.

PL4
BONE, BIOCHEMISTRY AND BEYOND: NEW PARADIGMS IN CKD MDB

P. Ebeling[1]

[1]MD, Department of Medicine, School of Clinical Sciences, Monash University, Clayton, Victoria, Australia

CKD is commonly associated with ageing. Most have stage 1, 2 or 3 CKD with estimated glomerular filtration rates (eGFR) of ^{3}90 mLs/min, 60–89 mLs/min, and 30–59 mLs/min, respectively. However, many will have stage 4 CKD (15–29 mLs/min) and stage 5 CKD (< 15 mLs/min) or are on dialysis. CKD is associated with excess morbidity, including fractures, and mortality. There is an exponential increase in hip fractures with increasing CKD stage.

CKD-Metabolic Bone Disorder (MBD) occurs in stage 4 and 5 CKD, and is characterized by bone (renal osteodystrophy), soft tissue (calcifications), and mineral (phosphate, calcium, fibroblast growth factor-23, calcitriol, sclerostin, Dikkopf-1) abnormalities. Its pathological endpoints are increased cardiovascular risk, mortality and fractures.

Hip fracture incidence is increased at every age for patients with Stage 3b, 4 and 5 CKD. Mortality after any fracture is also increased in patients with CKD, being highest in patients with Stage 5 CKD. It is unclear whether conventional anti-osteoporosis drugs are either appropriate, or effective, in patients with CKD stages 4 and 5, which has led to therapeutic inertia. A reluctance to use anti-resorptive drugs also relates to the possibility of underlying adynamic bone disease and theoretical worsening of skeletal fragility. In adynamic bone disease, turnover is low, mineralization is normal, and volume is low, while in hyperparathyroidism, turnover is high, mineralization is normal, and volume is low. By contrast, in osteomalacia, turnover is low, mineralization is low, and volume is normal.

2017 KDIGO guidelines state the optimal PTH level is not known. Instead, they renew a focus on assessment of both fracture risk, using DXA, and bone turnover in individual patients with CKD Stage 3a–5D, if these results will impact treatment decisions. In patients with high turnover, an anti-resorptive drug ± vitamin D should be used, while in patients with low turnover, an anabolic drug ± vitamin D could be used instead. The use of calcitriol or other active vitamin D analogs is reserved for patients with CKD stages 4–5 with severe and progressive hyperparathyroidism. Data from large RCTs show both risedronate and denosumab reduce vertebral fractures in patients with milder CKD (stage 2–4 CKD for risedronate, and stage 2–3 CKD for denosumab). Denosumab use can also be associated with severe hypocalcaemia in stage 4 and 5D CKD patients even though it is cleared by the liver rather than the kidney. This can be corrected by administration of active vitamin D analogues and calcium. Denosumab has no adverse effect on kidney function in CKD. Data from the Fracture Prevention Trial show teriparatide is effective at reducing vertebral and nonvertebral fractures in patients with eGFR < 80 mLs/min. The renal risks of bisphosphonates are poorly explored in patients with CKD stages 3b–5D, which calls for caution in this group.

Trabecular bone score and alternative bone imaging techniques such as hip structural analysis and high-resolution peripheral quantitative computerised tomography (HR-pQCT) need further evaluation pending clinical implementation. FRAX® predicts fracture probability in all CKD stages. However, more evidence is required to determine whether adjustments to conventional FRAX® estimates must be made in stage 4 and 5 CKD. Regarding biochemistry, 2017 ECTS guidelines recommend combining PTH with bone specific alkaline phosphatase (BSAP) as the best non-invasive way to divide patients into high or low bone turnover. However, in cases with either low PTH, or low or intermediate BSAP levels, a bone biopsy may be required to exclude low turnover renal osteodystropy (due to either adynamic bone disease or osteomalacia). However, the inability to perform a bone biopsy should not preclude treatment in those a high risk of fracture.

In conclusion, it is critical that an individual and tailored approach to managing metabolic bone disorder is taken in patients with CKD.

PL5
BONE RESORPTION INHIBITORS BEYOND THE SKELETON

B. Abrahamsen[1,2]

[1]OPEN, University of Southern Denmark, Odense, Denmark,
[2]Department of Medicine 1, Holbæk Hospital, Holbæk, Denmark

Objective: Update the audience on recent developments on extraskeletal effects of inhibitors of bone resorption. The talk will focus on strong antiresorptive osteoporosis medications.
Methods: Narrative literature review of new basic, translational, RCT and observational studies.
Results: Uniquely among inhibitors of bone resorption, denosumab is a circulating humanized antibody which engages with immune cell signaling inside and outside the skeleton. By contrast, bisphosphonates home in on calcified tissues and spend only a short time in circulation before elimination. Despite the difference in kinetics, both classes of antiresorptives may exert clinically relevant effects outside the skeleton, either directly or indirectly mediated through reduced turnover. Hence, potential effects on heart rhythm, major cardiovascular events, muscle function and falls, pain syndromes, obesity, glucose metabolism, asthma, tumour macrophages, cancer events and inflammation have been reported in observational studies and in post-hoc analyses of clinical trials. For example, RCTs find a significantly reduced risk of falls with denosumab though there is not sufficient data to surpass the trial sequential monitoring boundary. In addition, intervention data support increased muscle strength with denosumab though the concept is supported by minimal animal data. A pilot study suggests denosumab could improve male fertility in some circumstances. Despite the kinetic profile favouring delivery to bone, bisphosphonates may also exert effects on soft tissue tumours and anti-inflammatory effects as well as potentially ameliorating chronic pain. Of particular note it remains controversial yet hugely important if and how potent antiresorptives can modify body composition and cardiovascular risk.
Conclusions: There is mounting indirect evidence and post-hoc trial evidence to support evaluating potent bone resorption inhibitors in clinical trials powered to assess non-skeletal outcomes of major public health impact such as frailty, falling, breast cancer, atherosclerosis and diabetes.
Disclosures: Institutional research grants and personal fees from UCB, Pharmacosmos and Kyowa-Kirin as well as speakers fees from Gedeon Richter and Amgen.

PL6
MANAGEMENT OF OSTEOPOROSIS IN MULTI-ETHNIC POPULATIONS

M. Chandran[1]

[1]Singapore General Hospital, Singapore, Singapore

Professor Manju Chandran
Senior Consultant and Director
Osteoporosis and Bone Metabolism Unit
Singapore General Hospital
Clinical Professor, DUKE NUS Medical School, Singapore
Chairperson, Asia Pacific Consortium on Osteoporosis (APCO)

- The meanings of ethnicity and race are complex, convoluted, and intertwined. Ethnicity is a complex social construct. *The descriptor can be employed as a supplement to a person's race and is* used to refer to social groups of a common ancestry and shared culture.
- There is evidence that variations in BMD and osteoporosis exist between major racial and ethnic groups. What reference database to use for defining osteoporosis based on T-scores is a matter of debate.
- There is also emerging evidence that racial and ethnic disparities in osteoporosis outcomes and management exist with many factors such as socio-demographics, biological risk factors, and health behaviors accounting for these differences
- Variations in ethnicity-specific fracture risk also exist.
- How does one determine intervention thresholds in populations that are multi-ethnic? Do we use ethnic specific intervention thresholds, or do we use a non-ethnic specific universal intervention threshold in that population?

This presentation will focus on 4 major issues

- Ethnic variations in BMD and their impact on T-scores.
- Fracture risk differences between ethnicities.
- Determining fracture risk probability-based intervention thresholds in multi-ethnic populations.
- Is it possible to circumvent ethnic disparities in osteoporosis assessment and management.

PL7
HOW SHOULD WE DEFINE SARCOPENIA? PAST, PRESENT AND FUTURE PERSPECTIVES

A. J. Cruz-Jentoft[1]

[1]Servicio de Geriatría. Hospital Universitario Ramón y Cajal (IRYCIS), Madrid, Spain

The term "sarcopenia", initially coined during a late-eighties conference on nutrition and body composition, aimed to describe the age-related decline in lean body mass—a surrogate measure of skeletal muscle mass. Subsequent research revealed that while measures of lean mass (commonly assessed via DXA or BIA) fell short in predicting functional outcomes—specifically mobility, one of the main functions of skeletal muscle—, muscle function emerged as a more reliable predictor.

Around 2010, consensus meetings across different continents published updated definitions of sarcopenia. Despite slight variations, these definitions agreed in including muscle function (usually defined by muscle strength and body physical performance) in the concept of sarcopenia. Consequently, sarcopenia was conceptualized as an organ insufficiency (muscle failure) characterized by reduced muscle mass, low muscle strength and reduced physical performance, using different frameworks and cut-off points. This functional redefinition swiftly demonstrated clinical significance, propelling research that established sarcopenia's predictive capacity for critical outcomes such as mortality, disability and falls. These new facts were incorporated to a second wave of key sarcopenia definitions, that emphasized the pivotal role muscle strength in this condition.

However, recent challenges have surfaced. First, disparities among definitions across continent seem to be hindering both research and the universal integration of sarcopenia detection and management into routine clinical practice. Second, the incorporation of new disciplines to sarcopenia research—where body composition assessment (typically via CT scans) are available but functional measures are lacking—has revived the erroneous attribution of the word sarcopenia to name a reduced muscle mass. This is an error, as low muscle mass not only defines sarcopenia, but also malnutrition and cachexia.

Encouragingly, major consensus groups have now united under an initiative named Global Leadership Initiative in Sarcopenia (GLIS). This collaborative effort has produced an updated conceptual definition of sarcopenia, aiming for global applicability, with an operational definition currently in development. These advancements will be presented at the conference.

PL8
SARCOPENIA MANAGEMENT: MUSCLE-TARGETED INTERVENTIONS FOR HEALTHY AGEING

A. Cherubini[1]

[1]Geriatria Accettazione geriatrica e Centro di Ricerca per l'invecchiamento IRCCS INRCA and Università Politecnica delle Marche, Ancona, Italy

Objective(s): To present evidence based interventions for the management of sarcopenia.
Material and Methods: Extensive literature review.
Results: There is currently no drug which is approved for the prevention and treatment of sarcopenia. Therefore, its management is based on non-pharmacological interventions. Overall all existing guidelines strongly recommend resistance training to improve muscle strength, muscle mass and physical function in sarcopenic older patients based on moderate quality evidence. A recent meta-analysis on 42 RCTs confirms that resistance exercise combined with balance or aerobic exercise can ameliorate strength and physical function, measured by means of different tests. Moreover, resistance exercise, with or without nutritional supplementation, and in combination with aerobic and balance exercises, has a positive impact on quality of life (moderate evidence). A protein rich diet is also recommended, although the quality of evidence is low. The referral of older patients with sarcopenia to a dietician or a nutritionist might be considered. An adequate intake of proteins should be preferably implemented in combination with exercise. Other non-pharmacological interventions, e.g. vitamin D or omega 3 polyunsaturated fatty acid supplements, still lack a sufficient level of supporting evidence.
Conclusion(s): A multicomponent personalized non pharmacological intervention based on resistance exercise training, alone or combined with other types, i.e. aerobic and balance exercise, associated with adequate nutrition, i.e. adequate intake of proteins, is recommended in sarcopenic older people. There are ongoing studies to identify drugs for the prevention and treatment of sarcopenia.

PL9
NEW PERSPECTIVES IN OSTEOARTHRITIS MANAGEMENT

A. Mobasheri[1,2,3,4]

[1]Research Unit of Health Sciences and Technology, Faculty of Medicine University of Oulu, Oulu, Finland, [2]Department of Regenerative Medicine, State Research Institute Centre for Innovative Medicine, Vilnius, Lithuania, [3]Department of Joint Surgery, First Affiliated Hospital of Sun Yat-sen University, Guangzhou, Guangdong, China, [4]World Health Organization Collaborating Center for Public Health Aspects of Musculoskeletal Health and Aging, Université de Liège, Liège, Belgium

Osteoarthritis (OA) is the most common form of arthritis and a major contributor to pain and reduced mobility globally. OA is a mechano-inflammatory characterized by the gradual breakdown of articular cartilage and other joint tissue structures, and the subsequent development of inflammation, pain, stiffness, and reduced joint function. New perspectives in OA management represent a shift from traditional symptom management with pharmacological pain medications toward more holistic, patient-centered, self-managed and science-driven approaches to address this common and debilitating joint condition. The European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (ESCEO) has recently performed a review of multimodal/multicomponent approaches for knee OA therapy (Veronese et al., 2022). The new perspectives aim to address expectations of patients, healthcare providers and regulators. The emerging approaches in OA management aim to improve patient outcomes, slow disease progression, and enhance overall quality of life. There is increasing emphasis on the importance of weight management, exercise, diet and lifestyle. Disease modification with disease-modifying OA drugs (DMOADs) remains a very challenging but active area of research and development. The identification and validation of specific biomarkers associated with OA can assist in early diagnosis and monitoring of disease progression. However, there are currently no biomarkers that can be used to predict patient responses to various interventions, thus highlighting a major gap in the availability of tools for developing individualized treatments and precision medicine. Regenerative medicine approaches, including stem cell therapies, gene therapies and platelet-rich plasma (PRP) injections, are being investigated for their potential to repair damaged joint tissues and promote healing, but none of these have been approved by regulators. In the absence of effective disease modifying and regenerative treatments, there is increasing recognition of lifestyle factors, such as diet, exercise, weight management, sleep quality and mental health in OA management. Lifestyle modifications can help reduce pain and improve function in OA patients, and behavioral interventions are gaining importance in pain management. Digital health and wearable technologies have the potential to transform clinical practice and the design of clinical trials. Mobile apps, wearable devices, and telemedicine can be used to monitor OA patients' symptoms, activity levels, and adherence to treatment plans. These technologies can provide real-time data to healthcare providers for more effective management and intervention. Digital technologies are also likely to impact on patient education and shared decision-making, empowering patients with better knowledge about their condition, allowing them to self-manage their symptoms (Healey et al., 2023), and involving them in shared decision-making processes, leading to better treatment adherence and patient satisfaction. In the future, OA management will involve multi-disciplinary teams and collaborative care models involving various healthcare professionals, such as rheumatologists, orthopedic surgeons, physical therapists, pain specialists, and nutritionists, can provide comprehensive and personalized care for OA patients. These new perspectives in OA management represent a shift toward more holistic, patient-centered, self-managed and science-driven approaches to address this common and debilitating joint condition. Continued research, innovation, and collaboration among healthcare providers, researchers, and patients are essential to further advance the field of OA management.

References

Veronese N, Cooper C, Bruyère O, Al-Daghri NM, Branco J, Cavalier E, Cheleschi S, da Silva Rosa MC, Conaghan PG, Dennison EM, de Wit M, Fioravanti A, Fuggle NR, Haugen IK, Herrero-Beaumont G, Honvo G, Laslop A, Matijevic R, Migliore A, Mobasheri A, Pelletier JP, Prieto Yerro MC, Radermecker RP, Rannou F, Rizzoli R, Reginster JY. Multimodal Multidisciplinary Management of Patients with Moderate to Severe Pain in Knee Osteoarthritis: A Need to Meet Patient Expectations. Drugs. 2022 Sep;82(13):1347-1355. https://doi.org/10.1007/s40265-022-01773-5.

Healey EL, Lewis M, Corp N, Shivji NA, van der Windt DA, Babatunde OO, Simkins J, Bartlam B, Rowlands G, Protheroe J. Supported self-management for all with musculoskeletal pain: an inclusive approach to intervention development: the EASIER study. BMC Musculoskelet Disord. 2023 Jun 10;24(1):474. https://doi.org/10.1186/s12891-023-06452-4.

PL10
PRECISION MEDICINE APPROACHES IN THE ASSESSMENT OF FRACTURE RISK

N. Harvey[1]

[1]MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom

Established guidelines for the management of osteoporosis have traditionally focused on the question of treatment versus no treatment. However, we now have an enviable range of medications to improve bone mineral density across both antiresorptive and now anabolic mechanisms. Recent head-to-head studies have demonstrated superiority of teriparatide and romosozumab, compared with oral antiresorptives, both in terms of rapidity of onset and magnitude of effect. These findings have fuelled moves internationally, initially from ESCEO, supported by IOF, to promote a stratified approach to treatment, with choice of medication personalised according to baseline fracture risk. Different organisations espouse different definitions of very high fracture risk in this stratified approach, with the IOF-ESCEO favouring an absolute fracture probability threshold based on the European Guidelines using FRAX®. Whilst baseline fracture probability permits personalisation of treatment, with anabolics targeted to those at very highest risk, new understanding of genetic instruments for bone mineral density, and artificial intelligence approaches to risk assessment in big datasets, have suggested methods to stratify individuals at the level of healthcare systems. In future pathways linking together such assessments, it may be possible to identify those likely to be at high fracture risk on the basis of information held in a reimbursement database. These individuals could then be invited for subsequent clinical assessment and treatment, using FRAX and measurement of bone mineral density. In this presentation, I will review ways in which medication choices may be personalised to individuals, based on factors such as fracture risk, genetics and other considerations, and how these approaches might be synthesised into an integrated clinical pathway.

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): Oral Communications Abstracts

OC1
COMPARATIVE EFFECTIVENESS OF DENOSUMAB VERSUS BISPHOSPHONATES AMONG TREATMENT-EXPERIENCED POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS IN THE U.S. MEDICARE PROGRAM

J. R. Curtis[1], T. Aurora[2], Y. Liu[1], T.-C. Lin[3], L. Spangler[3], V. C. Brunetti[4], R. K. Stad[3], M. Mcdermott[3], B. D. Bradbury[3]

[1]University of Alabama at Birmingham, Birmingham, United States, [2]Foundation for Advancing Science, Technology, Education and Research, Birmingham, United States, [3]Amgen Inc., Thousand Oaks, United States, [4]Amgen Ltd., London, United Kingdom

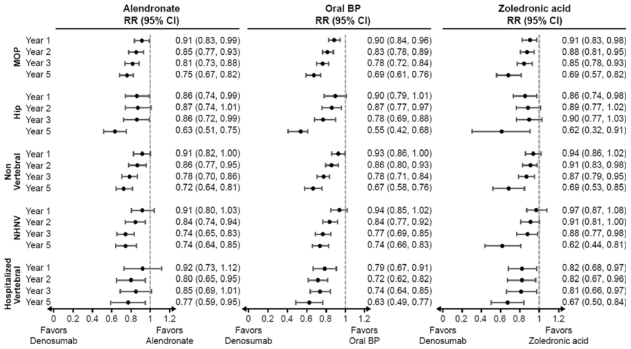
Objectives: Although clinical trials have shown that transitioning from bisphosphonates (BP) to denosumab (Dmab) increases bone mineral density at key skeletal sites more than remaining on BP, evidence from head-to-head studies evaluating fracture outcomes is lacking. This retrospective observational study compared the effectiveness of Dmab versus BP in reducing fracture risk among treatment-experienced women with postmenopausal osteoporosis (PMO) in the U.S.

Methods: Female Medicare fee-for-service beneficiaries $\geq$ 66 years of age with prior history of treatment with an oral BP, who newly initiated Dmab (n $\sim$ 108,000), a different oral BP (alendronate, ibandronate, or risedronate; n = 100,649), alendronate (Aln; n = 53,165), or zoledronic acid (ZA; n = 35,100) between Jan 1, 2012 to Dec 31, 2018 were followed from treatment initiation (index date) until the first instance of a fracture, treatment discontinuation (defined as the end of exposure + 60-day gap) or switch, Medicare disenrollment, death, end of available data (Dec 31, 2019), or 5 years post-index date. A doubly robust inverse-probability of treatment (weights estimated from multivariate logistic regression models) and censoring (weights estimated from multivariate Cox Proportional Hazards regression models) weighted function was used to estimate the relative risk (RR) associated with the use of Dmab compared with oral BP, Aln, and ZA for hip, nonvertebral (NV; includes hip, humerus, pelvis, radius/ulna, other femur), non-hip, nonvertebral (NHNV), hospitalized vertebral (HV), and major osteoporotic (MOP; nonvertebral and hospitalized vertebral) fractures for the overall study period and by year of follow-up.

Results: Over a maximum of 5 years of follow-up, Dmab reduced the risk of hip fracture by 45% (RR = 0.55; 95% CI 0.42–0.68), 37% (0.63; 0.51–0.75), and 38% (0.62; 0.32–0.91), and reduced the risk of MOP fracture by 31% (0.69; 0.61–0.76), 25% (0.75; 0.67–0.82), and 31% (0.69; 0.57–0.82) compared with oral BP, Aln, and ZA respectively (Figure). Similar results were observed for NV, NHNV, and HV fractures, with an increase in the magnitude of fracture risk reduction with increasing duration of exposure across all fracture outcomes.

Conclusion: In a large cohort of treatment-experienced women with PMO, we observed robust, clinically meaningful reductions in the risk of hip, NV, NHNV, HV, and MOP fractures for patients on Dmab compared to oral BP, Aln, and ZA; greater reductions in fracture risk were observed with longer duration of exposure.

Figure. Forest Plot of Relative Risk of Fracture Comparing Denosumab to Alendronate, Oral BP, and Zoledronic Acid



OC2
BMD RESPONSES AT THE LUMBAR SPINE AND TOTAL HIP IN PATIENTS RECEIVING ROMOSOZUMAB, DENOSUMAB AND ALENDRONATE: A POST HOC ANALYSIS OF THE RANDOMISED FRAME AND ARCH PHASE 3 TRIALS

F. Cosman[1], L. Gifre[2], K. Poole[3], F. Thomasius[4], B. Langdahl[5], P. R. Ebeling[6], J. P. van den Bergh[7], E. M. Lewiecki[8], J. Timoshanko[9], Z. Wang[10], C. Libanati[11]

[1]Columbia University, New York, United States, [2]Department of Rheumatology, Hospital Germans Trias i Pujol, Barcelona, Spain, [3]Department of Medicine, University of Cambridge, Cambridge, United Kingdom, [4]Frankfurter Hormon & Osteoporosezentrum, Frankfurt, Germany, [5]Department of Endocrinology, Aarhus University Hospital, Aarhus, Denmark, [6]Department of Medicine, School of Clinical Sciences, Monash University, Melbourne, Australia, [7]VieCuri Medical Center & Maastricht University Medical Center, Maastricht, Netherlands, [8]New Mexico Clinical Research & Osteoporosis Center, Albuquerque, United States, [9]UCB Pharma, Slough, United Kingdom, [10]Amgen Inc., Thousand Oaks, United States, [11]UCB Pharma, Brussels, Belgium

Objectives: To assess the proportion of postmenopausal women with osteoporosis (OP) achieving clinically meaningful improvements in BMD at both the total hip (TH) and lumbar spine (LS) over 1 year after treatment with romosozumab (Romo), denosumab (Dmab) or alendronate (ALN) using data from FRAME (NCT01575834) and ARCH (NCT01631214) studies. Correlations between overall change in LS and TH BMD for each treatment were also assessed.

Materialsand methods: For Romo/ALN comparisons, BMD data from ARCH were utilised; patients were randomised to Romo 210 mg monthly (QM) or ALN 70 mg weekly for 12 months.[1] For Romo/Dmab comparisons, BMD data from FRAME were utilised included women initially randomised to Romo 210 mg QM for 12 months and those initially randomised to placebo who then received Dmab 60 mg Q6M from months 12 to 24.[2] Because Dmab was initiated 1 year after Romo, inverse probability of treatment weighting was utilised to normalise differences in BL characteristics between Romo and PBO/Dmab groups.

Proportion of patients achieving $> 3\%$ and $> 6\%$ improvements in TH and LS BMD over 12 months was calculated, as previously reported.[3,4] Correlation between overall percentage improvement in LS and TH BMD was evaluated for each treatment using Pearson's correlation coefficient (r).

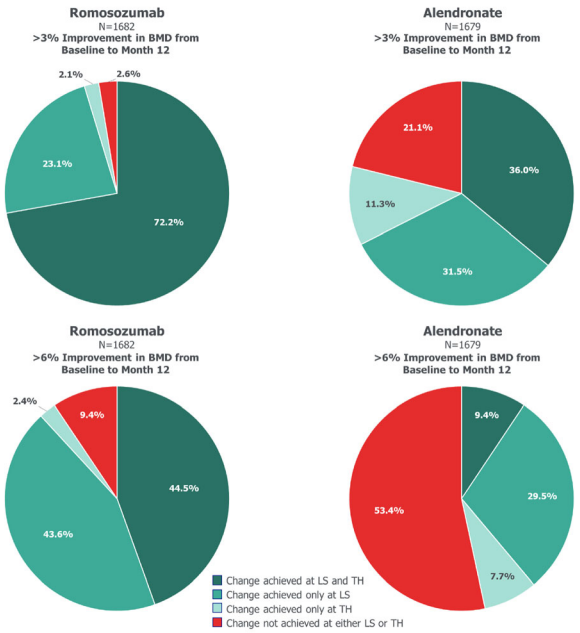
Results: Approximately twice as many women on Romo (72%) vs ALN (36%) had > 3% BMD gains at both sites. These proportions were 45% and 9%, respectively for > 6% BMD gains at both sites (Fig. 1). For Romo vs Dmab, 76% vs 40%, respectively, had > 3% BMD gains at both sites; 45% vs 8% had > 6% BMD gains at both sites (Fig. 2). Substantially greater proportions of patients failed to achieve improvements at either site with ALN and Dmab vs Romo, at both BMD gain thresholds. Correlations between percentage improvement in BMD at the LS and TH were stronger for Romo vs ALN (r = 0.43 vs r = 0.26) and Romo vs Dmab (r = 0.45 vs r = 0.25).

Conclusion: Substantially greater proportions of patients receiving Romo achieved concurrent, clinically meaningful BMD improvements of > 3%/ > 6% at both the LS and TH within 1 year compared with either ALN or Dmab; correlation between overall percentage improvements at both sites was also stronger with Romo. Data add to the body of evidence indicating the superiority of Romo in attaining simultaneous BMD improvements across relevant skeletal sites in patients with OP.

References: 1. Saag NEJM 2017;377:1417-27; 2. Cosman NEJM 2016;375:1532-431; 3. Cosman Osteoporos Int 2022; 33:1243-1256; 4. Bolognese J Clin Densitom 2013;16:147-53.

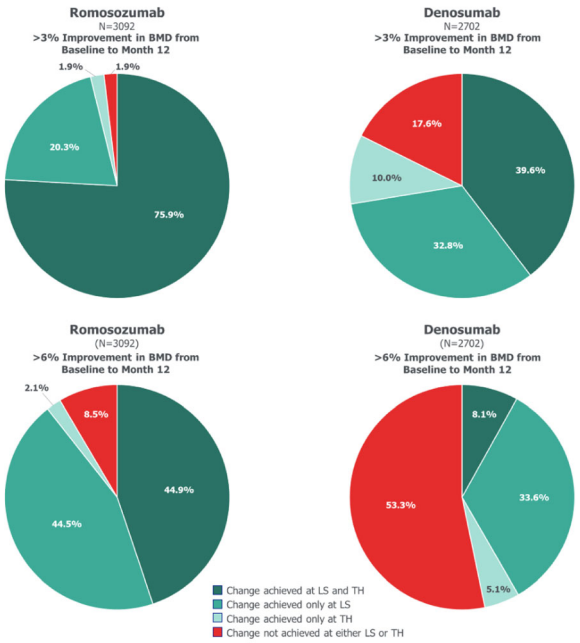
Funding: UCB Pharma and Amgen Inc.

Figure 1: Proportions of Patients Achieving BMD Improvements of >3% and >6% over 12 Months in ARCH



BMD: bone mineral density; TH: total hip; LS: lumbar spine

Figure 2: Proportions of Patients Achieving BMD Improvements of >3% and >6% over 12 Months in FRAME



BMD: bone mineral density; TH: total hip; LS: lumbar spine

Disclosures: **FC**: institutional grants and research support from Amgen and from Radius Health; served as a consultant for Amgen, Biocon, Enterabio, Pfizer/Myovant and Radius Health; served on the speakers' bureaus for Amgen and Radius Health; **LG**: lecture fees from UCB, Amgen, Rubió, Stada, Theramex, Lilly, Abbie, Astellas, Kyowa Kyrin and Gebro. Attending meetings from UCB, Amgen and Abbvie. Advisory Board from UCB/Amgen and Gebro; **KP**: advisory board, clinical trial local Prinicpal Investigator, educational services, lectures from Amgen, Mereo, UCB and Ultragenyx. KESP donates all fees anonymously to various charities via Cambridge Enterprise, the commercial arm of the University of Cambridge. Research grant from Amgen; **FT**: consulting fees from: Amgen, Fresenius, Gedeon-Richter, Kyowa Kirin, Stada, Theramex, UCB. Lectures: Abbvie, Alexion, Amgen, Gedeon-Richter, Hologic, Lilly, Hexal, Theramex, Das Fortbildungskolleg, UCB; **BL**: fees and honoraria for lectures and advice from Amgen, Gedeon-Richter, Gilead, and UCB Pharma; research grants for Aarhus University Hospital from Amgen Inc. and Novo Nordisk; **PE**: grants from Amgen, Sanofi and Alexion. Honoraria from Amgen, Kyowa Kirin and Alexion; **JPVdB**: honoraria from Amgen and UCB Pharma; **EML**: Amgen: investigator, consultant, speaker; Radius: investigator, consultant; Kyowa Kirin: consultant, speaker; Ultragenyx: investigator; Angitia: consultant; Ascendis: consultant; **JT,CL**: employee and shareholder of UCB Pharma; **ZW**: employee and shareholder of Amgen Inc.

OC3
CARDIOVASCULAR SAFETY OF ROMOSOZUMAB IN OSTEOPOROSIS PATIENTS: A TRINETX MULTI-INSTITUTIONAL RESEARCH NETWORK ANALYSIS

C.-R. Li[1], H.-T. Lee[1], Y.-L. Deng[1]

[1]Taichung Veterans General Hospital, Taichung city, Taiwan

Objective: Romosozumab has been shown to enhance bone mineral density (BMD) and reduce fracture risk in humans by elevating serum biochemical markers of bone formation while simultaneously decreasing markers of bone resorption. However, given the potential link with acute coronary syndrome (ACS), this article focuses on a

comprehensive evaluation of romosozumab's cardiovascular safety profile. The goal is to ascertain the extent to which romosozumab may influence the risk of ACS, thereby ensuring a balanced understanding of its benefits and potential cardiovascular risks.

Material and methods: Utilizing the TriNetX database, alongside the RxNorm drug naming system and International Classification of Diseases-10 (ICD-10) codes, we identified 7634 adult osteoporosis patients treated with romosozumab. We designated the initial administration of romosozumab as the index event. Analytical statistics were employed to evaluate the safety profile, particularly focusing on the relationship between romosozumab and ACS within three years following the index event.

Results: In the logistic regression analysis, it was observed that the presence of chronic kidney disease (CKD) and essential hypertension are significant risk factors for ACS in patients treated with romosozumab. Specifically, CKD was associated with a two-fold increase in the risk (OR: 2.04; 95% CI 1.24–3.37, p = 0.005), while essential hypertension was linked to an approximately 82% higher risk (OR: 1.82; 95% CI 1.14–2.90, p = 0.011). Additionally, a subgroup analysis comparing patients receiving less than 12 doses to those receiving 13 to 24 doses of romosozumab within three years showed no significant difference in the risk of ACS (RR: 0.8; 95% CI 0.47–1.36), indicating that dosage within this range does not significantly alter the likelihood of ACS occurrence.

Conclusions: The present study uncovered a heightened rate of ACS in patients with CKD or essential hypertension who were treated with romosozumab. Moreover, the incidence of ACS showed no significant variance between patients administered fewer than 12 doses and those receiving 13–24 doses over a three-year period. For a comprehensive assessment of its risk-benefit balance, additional long-term and comparative research is crucial to substantiate these safety evaluations.

Disclosures: The authors of this manuscript have no conflict of interest to disclose.

OC4
THE COMPARATIVE EFFECTIVENESS AND CARDIOVASCULAR SAFETY OF ABALOPARATIDE AND TERIPARATIDE IN POSTMENOPAUSAL WOMEN NEW TO ANABOLIC THERAPY: UPDATE OF A REAL-WORLD RETROSPECTIVE ANALYSIS

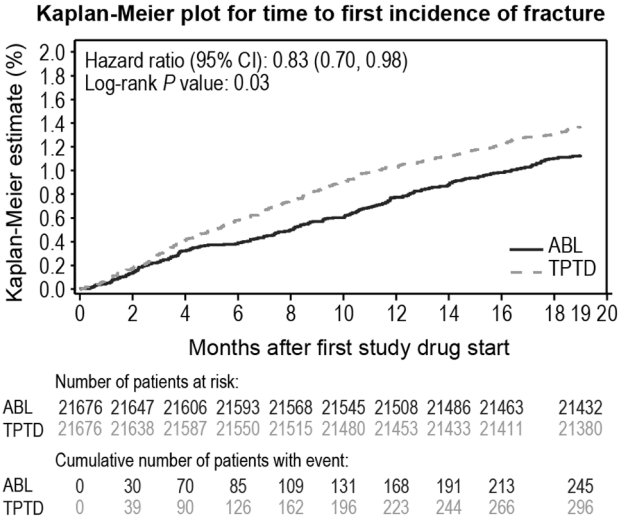
J.-Y. Reginster[1,2], R. Rizzoli[3], B. Cortet[4], Y. Wang[5], J. Chiodo[5], B. H. Mitlak[5]

[1]Epidemiology and Health Economics, University of Liège, Liège, Belgium, [2]WHO Collaborating Center for Epidemiology of Musculoskeletal Health and Ageing, Liège, Belgium, [3]University Hospitals of Geneva, Geneva, Switzerland, [4]Rheumatology, Lille University Hospital-Roger Salengro Hospital, Lille, France, [5]Radius Health, Inc, Boston, MA, United States

Objective: A prior real-world retrospective observational cohort study compared abaloparatide (ABL) and teriparatide (TPTD) treatment initiated between May 1, 2017 and Jul 31, 2019 (Cosman, *OI* 2022). The current study reexamined comparative effectiveness of ABL and TPTD following additional years of clinical experience; extending the study period through Dec 31, 2021 and includes a primary effectiveness analysis of time to first hip fracture.

Material and methods: Anonymized claims data from Symphony Health Patient Source, Osteoporosis Patient Transactional Datasets were accessed. Index date was the date of the initial prescription dispensed during the study period. Time to first hip fracture and other fracture endpoints were compared using a Cox proportional hazards model. *P* values were calculated using a log-rank test.

Results: Propensity matching was used to define study cohorts of women ≥ 50 years, new to anabolic therapy with ABL or TPTD (n = 21,676 per cohort) which were well matched on 73 baseline parameters. Median age was 67 years, 33.8% had a prior fracture at any time; 22.1% had a fracture in the year prior to index date. Over 18 months (+ 30 days follow-up), 245 (1.1%) women in the ABL and 296 (1.4%) in the TPTD cohort had a hip fracture (HR [95% CI] 0.83 [0.70, 0.98]; *P* = 0.03 [Figure]). Nonvertebral fractures were reported in 947 (4.4%) women in the ABL and 1078 (5.0%) in the TPTD cohorts (0.88 [0.80, 0.96]; *P* = 0.003). Major CV events were balanced between cohorts.



Conclusions: The current study doubles the exposure from the prior study and demonstrates that following 18 months of therapy, ABL was more effective than TPTD in reducing the incidence of hip fracture and nonvertebral fracture.

Disclosures: J-YR: Fees IBSA-Genevrier, Mylan, Radius Health, Inc (Radius), Pierre Fabre, Teva, CNIEL, Dairy Research Council; grants IBSA-Genevrier, Mylan, CNIEL, Radius; RR: Fees Abiogen, Amgen, Danone, Echolight, European Milk Forum, Nestlé, ObsEva, Pfizer Consumer Health, Radius, Theramex; BC: Fees Alexion, Amgen, Aptissen, Expanscience, Lilly, Kyowa-Kirin, MSD, Novartis, Sublimed, Theramex, UCB, Viatris; YW, JC, BHM: Employees of Radius.

OC5
ZOLEDRONIC ACID AND DENOSUMAB ARE COMPARABLE IN DIABETIC OSTEOPOROTIC PATIENTS: A POPULATION-BASED COHORT STUDY

V. Rouach[1], H. Gortler[2], Y. Greenman[1], G. Chodick[3], I. Goldshtein[4]

[1]Institute of Endocrinology, Diabetes, Hypertension and Metabolism, Sourasky Medical Center, Tel Aviv, Israel, Tel Aviv, Israel, [2]Medical school, Sackler Faculty of Medicine, Tel Aviv University, Israel, Israel, Tel Aviv, Israel, [3]Epidemiology Department, School of Public Health, Sackler Faculty of Medicine, Tel Aviv University, Israel, Tel Aviv, Israel, [4]Maccabitech institute for research and innovation, Maccabi Healthcare Services, Tel Aviv, Israel

Background: Anti-resorptive therapies are the mainstay of osteoporosis management, but evidence of their efficacy in the diabetic population is limited and comparison between treatments is lacking. A retrospective analysis, presented at the American Society for Bone and Mineral Research (ASBMR) 2023 Annual Meeting, suggests that denosumab leads to greater reduction in fracture risk than zoledronic acid among treatment-naive postmenopausal women with osteoporosis. However, a recently published comparative study suggests higher mortality with denosumab versus oral bisphosphonates.

Aim: To assess the association between exposures to zoledronic acid or denosumab and outcomes of major osteoporotic fracture and mortality in osteoporotic patients with diabetes type 2.
Methods: The study population was identified by electronic records of a diabetes registry cross-linked with an osteoporosis registry of a large healthcare organization in Israel. Index date was at treatment initiation. The following data was collected: demographics, Comorbidity Index (CCI), diabetes complications, bone mineral density (BMD) T-scores, hemoglobin A1c levels, eGFR, purchase of statins and anti-resorptive agents. Exposure groups were matched by age, sex and eGFR. Kaplan-Meier curves were generated to assess the time to outcomes. Multivariable Cox's proportional hazards survival model was performed.
Results: A total of 27503 diabetic osteoporotic patients were identified, 13343 (48%) initiated treatment; 12214 (91.5%) started an oral bisphosphonate, 627 (4.7%) zoledronic acid and 502 (3.7%) denosumab. The median follow-up was 8.9 years.
Compared to zoledronic acid-treated patients, before matching the denosumab-treated patients were older (75.7 vs 71.9, $p < 0.01$), had longer diabetes duration (8.4 vs 7.2, $p < 0.01$), were more frequently treated with insulin (29.7 vs 23.9, $p = 0.02$) and had a lower eGFR (59.4 vs 75.3, $p < 0.01$). Male/Female ratio, BMI, CCI, smoking status, alcohol consumption, Hip BMD, HbA1c levels, microvascular complications, hypoglycaemic events and statins prescriptions were similar. After matching, 400 pairs of subjects treated with zoledronic acid or denosumab remained. The 5-year cumulative incidence of fracture and death events were similar in the two treatment groups (38 vs 31%, and 36% vs 41% respectively). We did not observe any significant differences in the risk of fracture HR = 1.17 (0.78–1.75) or death HR = 1.12 (0.87–1.44) between these two groups of treatments.
Conclusions: Our findings underscore the comparability of Zoledronic Acid and Denosumab in managing osteoporotic fractures and mortality among diabetic patients, offering valuable insights for treatment strategies in this vulnerable population.
Keywords: Anti-resorptive treatment, diabetes, osteoporosis, fracture prevention, mortality.

OC6
ANTIRESORPTIVE MEDICATION-RELATED JAW OSTEONECROSIS: AN EUROPEAN EUDRAVIGILANCE DATABASE-BASED RETROSPECTIVE COHORT STUDY

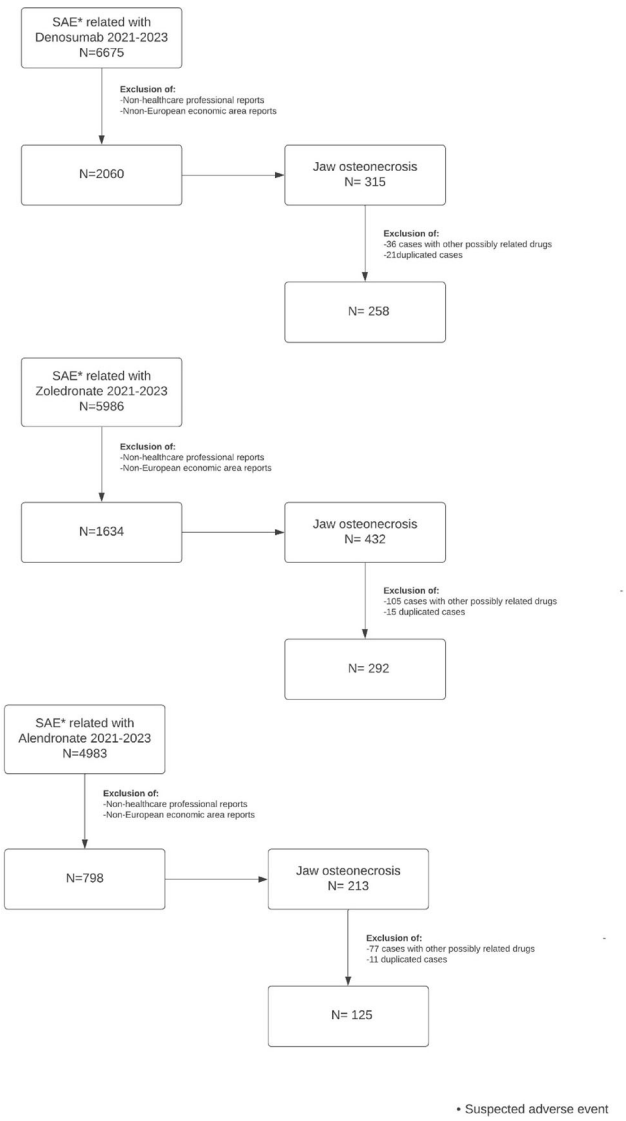
S. Ferreira Azevedo[1], C. Pinto Oliveira[1], A. R. Prata[1], I. Cunha[1], A. Barcelos[1]

[1]Rheumatology department, Hospital Infante D. pedro- Unidade Local de Saúde Região de Aveiro, Aveiro, Portugal

Objectives: To compare the occurrence of jaw osteonecrosis (JON) with denosumab, alendronate and zoledronate, by analyzing real-world data from the European EudraVigilance database.
Methods: Retrospective study using the EudraVigilance, including Suspected adverse reactions (SARs) related to denosumab, alendronate and zoledronate, between 2021–2023. Only SARs reported by healthcare professionals in the European Economic Area were included. A descriptive and comparative analysis was performed and the Reporting Odds Ratio (ROR) was calculated for each treatment.
Results: 17,644 (6675 denosumab, 4983 alendronate, and 5986 zoledronate-related) SARs were reported. 258 denosumab, 125 alendronate, and 292 zoledronate-related JON cases were included. (Fig. 1).
For all treatments, most patients were female between 65–85 years. The most common treatment indication was "Osteoporosis" for denosumab (58.5%) and alendronate (86.4%), while zoledronate was mostly prescribed in "Oncologic context" (69.2%).

Regarding denosumab reports, most patients had recovered or were recovering (56.9%), and the percentage of those not recovering was higher in the elderly (> 64 years) ($p < 0.05$). The percentage who recovered with sequelae was higher in patients older than 85 years ($p < 0.05$), and patients with "Oncologic context" recovered more frequently compared to patients with "Osteoporosis" ($p < 0.05$). Regarding the presence of seriousness criteria, most patients with "disability" did not recover ($p < 0.05$). In contrast with denosumab, most patients under alendronate or zoledronate did not recover (66.7%). While this percentage was higher in the elderly under alendronate ($p < 0.05$), no differences were found in the zoledronate group.

Comparing the risk of JON between the three treatments, based on the ROR, we found a higher risk with zoledronate [ROR 1.35 CI (1.14–1.59)]. The lowest risk was found for denosumab [ROR: 0.74 CI (0.63–0.68)]. The risk associated with alendronate treatment was equivalent to the others [ROR: 1.06 CI (0.86–1.31)].
Conclusion: In our analysis zoledronate treatment demonstrated a higher incidence of JON, while denosumab represented the safest drug. However, indication for the use of zoledronate was mostly an oncologic context, which implies a more intensive treatment. Therefore, our findings must be interpreted with caution. JON accounted for 12.5% to 17.9% of all SARs, in line with the current evidence of its infrequent occurrence.



OC7
CLINICAL IMPACT OF ACUTE SYMPTOMATIC VERTEBRAL FRACTURES IN THE UNITED STATES: AN OBSERVATIONAL STUDY

N. Binkley[1], M. Mcdermott[2], E. Yeh[2], J. Lane[3], J. Cheung[4], M. Amet[4], F. Cosman[5]

[1]University of Wisconsin, Madison, United States, [2]Amgen Inc, Thousand Oaks, United States, [3]Weill Cornell Medical College, New York, United States, [4]Adelphi, Bollington, United Kingdom, [5]Columbia University, New York, United States

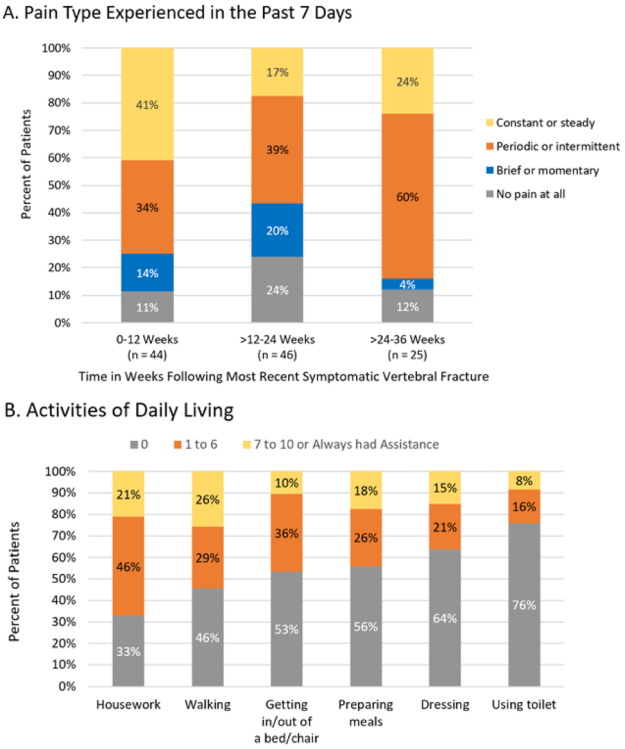
Objectives: To characterize pain status (frequency, severity, persistency) and effect on activities of daily living (ADLs) in patients with symptomatic vertebral fractures (VF).

Materials and methods: This was an observational, cross-sectional, survey of patients age $\geq$ 50 years with $\geq$ 1 symptomatic osteoporotic VF within the last 36 weeks (wks) confirmed by spine imaging, recruited from July 2022 to August 2023 at 7 clinical sites across the United States. Data were collected through a one-time patient survey and retrospective medical chart review, and analyzed descriptively. Patients described their pain level and pain characteristics.

Results: Of the 117 patients enrolled, most were postmenopausal women (82%), white (92%), and $\geq$ 60 years of age (95%); 38% of patients were recruited within 12 wks, 39% within > 12–24 wks, and 23% within > 24–36 wks of having a symptomatic VF. Index VF was confirmed by x-ray (56%), MRI (49%), CT scan (33%), and/or DXA (15%). As shown in Fig. 1A, within the first 12 wks of an acute symptomatic VF, pain was reported as constant/steady by 41% of patients. After 12 wks, the proportion who reported constant/steady pain was lower but still more than 20% in patients who had a VF > 24–36 wks earlier; at that time, more than 80% of patients reported at least intermittent pain. 43% reported high pain severity (between 7–10) within the first 12 wks following VF, and 30% and 36% reported high severity at > 12–24 wks and > 24–36 wks, respectively. The most common movements that increased pain were standing up (56%), bending down (54%), and lifting (43%). In general, patients reported a negative impact of VF on various ADL, with housework and walking being most impacted (Fig. 1B).

Conclusion: In this cross-sectional study, back pain persisted and affected ADL in the majority of patients after 24 wks. Even > 24–36 wks after a VF, 84% of patients experienced constant/steady or periodic/intermittent pain. ADLs that were difficult to complete required movements that patients often reported as precipitating pain. Acknowledging the study limitations of cross-sectional design and small numbers enrolled at different times from VF, particularly in the > 24–36-wk group, these data provide insight into the impact of VF on patients and emphasize the importance of VF prevention.

Figure 1 (A) Patient reported pain type experienced over 7 days **(B)** Patients' ratings on their ability to perform said activity on a scale of 1 to 10, with 0 = not limited at all and 10 = extremely limited.



OC8
MULTIMORBIDITY AND RISK OF FALLS, FRACTURES, AND JOINT REPLACEMENTS OVER TWO DECADES: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY

L. D. Westbury[1], C. Pearse[1], R. Rambukwella[1], K. A. Ward[1], C. Cooper[1], E. M. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom

Objective: While multimorbidity is known to be associated with risk of common musculoskeletal conditions, little is known about the relationship between comorbidity burden and the risk of subsequent development of conditions of musculoskeletal ageing, specifically risk of fractures, falls and joint replacements. We examined this in the community-dwelling Hertfordshire Cohort Study.

Material and methods: Data were analysed from 2997 individuals (age 59–73 at baseline). Outcomes (fractures, falls and lower limb joint replacements) were identified using ICD-10 and OPCS-4 codes from Hospital Episode Statistics data, available from baseline (1998–2004) until December 2018. Number of systems medicated (a marker of morbidity level) in relation to risk of outcomes was examined using sex-stratified Cox regression.

Results: Among both men and women, a greater number of systems medicated was related to increased risk of falls ($p < 0.001$) and lower limb joint replacements ($p < 0.003$). More systems medicated was only related to increased risk of fracture among women ($p < 0.001$ among women and $p = 0.186$ among men). Graded associations were observed for higher risks of fracture among women as the number of systems medicated increased. In contrast, a threshold effect was observed for falls among men and women with much higher risk of falls among men and women with at least two systems medicated compared to those who had less than two. Similarly, men and women with more than two systems medicated had much higher risks of a

lower limb joint replacement compared to those with two systems medicated or less.

Conclusions: Higher numbers of systems medicated was associated with increased risk of adverse health outcomes related to poor musculoskeletal health in older community-dwelling adults, with a threshold effect observed for falls and lower limb joint replacements. Intervention strategies to reduce multimorbidity among middle aged and older people may reduce the incidence of fractures, falls and joint replacements.

OC9
TEN-YEAR FOLLOW-UP OF FRACTURE RISK IN A SYSTEMATIC POPULATION-BASED SCREENING PROGRAMME: THE RISK-STRATIFIED OSTEOPOROSIS STRATEGY EVALUATION (ROSE) RANDOMISED TRIAL

T. G. Petersen[1], B. Abrahamsen[1], M. Højberg[2], M. J. Rothmann[3], T. Holmberg[4], J. Gram[5], M. Beck[6], K. E. Åkesson[7], K. M. Javaid[8], A. P. Hermann[9], K. H. Rubin[1]

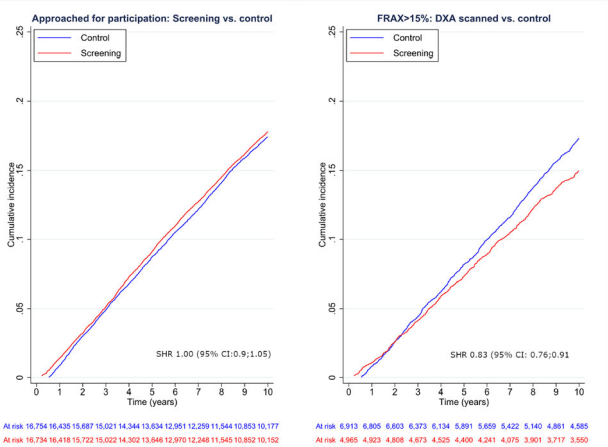
[1]Research unit OPEN, department of clinical research, University of Southern Denmark, Odense, Denmark, [2]Department of Internal Medicine, Hospital of Southern Norway, Arendal, Norway, Arendal, Norway, [3]Steno Diabetes Center, Odense University Hospital, Odense, Denmark, Odense, Denmark, [4]Centre for Childhood Health, Copenhagen, Denmark, Copenhagen, Denmark, [5]Department of Endocrinology, Esbjerg Hospital, University Hospital of Southern Denmark, Esbjerg, Denmark, [6]Department of Political Science and Public Management, University of Southern Denmark, Odense,, Odense, Denmark, [7]Clinical and Molecular Osteoporosis Research Unit, Department of Clinical Sciences, Lund University, Malmö, Sweden and Department of Orthopaedics, Skåne University Hospital, Malmö, Sweden, Lund, Sweden, [8]Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford, the United Kingdom, Oxford, United Kingdom, [9]Research Unit for Endocrinology, Odense University Hospital, Odense, Denmark; University of Southern Denmark, Odense, Denmark

Objective: Primary aim is to assess the effectiveness of the ROSE programme in reducing the incidence of major osteoporotic fractures (MOF) over a ten-year follow-up period. Secondary objective: impact on the incidence of hip fractures, all fractures, and mortality.

Material and methods: This ten-year follow-up of the ROSE randomized trial tested the effectiveness of a screening program utilizing the Fracture Risk Assessment Tool (FRAX) to select women for DXA scan to guide subsequent standard osteoporosis treatment. Women residing in the Region of Southern Denmark, aged 65–80, were randomised (single masked) into a screening or a control group and subsequently approached by a mailed questionnaire in 2010/11. Based on the questionnaire, women in the screening group with a FRAX value $\geq$ 15% were invited for DXA scanning. Fracture outcomes were derived from nationwide registers.

Results: During follow-up, 7355 MOFs were observed. No differences in MOF incidence were identified, comparing the 17,072 women in the screening group with the 17,157 controls in the intention-to-treat analysis (IRR 1.01, 0.95; 1.06). However, per-protocol, women DXA-scanned exhibited a 16% lower incidence of MOF (IRR 0.84, 0.76; 0.92) than controls with a FRAX value $\geq$ 15%. Similar trends were observed for hip fractures, all fractures, and mortality.

Conclusion: The ROSE program had no statistical significant effect on osteoporotic fracture incidence or mortality in the total screened population. However, it demonstrated a benefit in terms of risk reduction for women at moderate to high risk who underwent the DXA scan intervention. In other words, the intervention was effective in the prespecified moderate or high risk population (FRAX > 15%) in which DXA examination and a clinical path to treatment was offered, but the overall fracture burden in the community was not reduced by this strategy. Hence, the use of self-administered questionnaires as screening tools may not be an efficient approach for systematic screening due to the low and differential screening uptake.



OC10
ELEVATED FRACTURE RISK IN A DANISH COHORT WITH TYPE 2 DIABETES MELLITUS AND MICROVASCULAR DISEASES

M. Nasser[1], T. Grønborg[2], F. Kristensen[2], R. Thomsen[2], A. Vaag[3], J. Nielsen[1], K. Højlund[1], M. Olsen[4], P. Vestergaard[5], R. Eastell[6], M. Frost[1]

[1]Department of Clinical Research, University of Southern Denmark, Odense, Denmark, [2]Department of Clinical Epidemiology, Aarhus University Hospital, Aarhus, Denmark, [3]Steno Diabetes Center Copenhagen, Copenhagen, Denmark, [4]Department of Medicine and Steno Diabetes Center Zealand, Holbaek, Denmark, [5]Steno Diabetes Center North Denmark, Aalborg, Denmark, [6]Academic Unit of Bone Metabolism, University of Sheffield, Sheffield, United Kingdom

Objective: Microvascular diseases (MVD) in type 2 diabetes mellitus (T2D) are associated with alterations in the bone microarchitecture, but their association with fracture risk is unclear. We investigated whether MVD (retinopathy, nephropathy, and neuropathy) are associated with higher fracture risk in persons with recently diagnosed T2D.

Material and methods: We identified 10,491 persons with recently diagnosed T2D, enrolled in the Danish Centre for Strategic Research in Type 2 Diabetes cohort between 2010 and 2022. The primary outcomes were any hospital-diagnosed fracture (except facial and cranial), and major osteoporotic fractures (MOF), defined as clinical vertebral, hip, humerus, and forearm fractures, in persons with hospital-diagnosed MVD versus without MVD. We used Cox proportional hazard models to calculate crude and adjusted hazard ratios (aHRs).

Results: During a median follow-up of 7.6 years IQR (3.5; 9.7), the rates of any fracture were higher in persons with T2D and MVD versus no MVD (aHR 1.31; 95% CI [1.15; 1.51]), and a higher numerically rate was observed in men (aHR 1.41 [1.15; 1.72]) than women (aHR 1.21 [1.00; 1.46]) (p-interaction = 0.76). Similarly,

MOF rates were elevated in persons with MVD (aHR 1.33 [1.09; 161]), and a higher numerically rate was observed in men (aHR 1.43 [1.04, 1.96] than women (aHR 1.26 [0.98, 1.61]) (p-interaction = 0.80). The rates for any fracture and MOF were particularly highest in persons with neuropathy (aHR 1.49 [1.24; 1.78] and aHR 1.54 [1.19; 1.99], respectively).
Conclusion: Fracture risk is elevated in persons with T2D and MVD, particularly those with neuropathy.

OC11
ALARMING INCREASE IN BURDEN OF SPINAL FRACTURE IN THE MIDDLE EAST AND NORTH AFRICA: A 30-YEAR SECONDARY ANALYSIS OF THE GLOBAL BURDEN OF DISEASE STUDY 2019

A. H. Hoveidaei[1], A. Ghaseminejad-Raeini[2], M. S. Khonji[2], A. Azarboo[2], S. H. Hosseini-Asl[2], K. Pirahesh[2]

[1]Sports Medicine Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran, [2]School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

Objective: Particularly in the elderly, spinal fractures are among the most frequent injuries associated with osteoporosis. Despite the region's ageing population, rising osteoporosis incidence, and devastating ongoing conflicts, the epidemiology and burden of spine fractures remain unexplored in the Middle East and North Africa (MENA). This investigation's primary goal was to look into the overall incidence and years lost due to disability (YLDs) of spinal fractures over the past thirty years in MENA, implementing data from the global burden of diseases (GBD) 2019.
Material and method: The incidence and YLD of spinal fractures in 21 MENA countries from 1990 to 2019 were examined in this cross-sectional study utilizing GBD data. Using a linear regression model, time-trend analysis was carried out, and the beta coefficient and P value were provided. Estimates were provided for various genders and age groups. Additionally, LOESS regression was used to examine the connection between the sociodemographic index and the prevalence of spinal fractures. Lastly, research was done on the distribution of spinal fracture causes. Python was utilized to create the graphs, and IBM SPSS was used to perform all analyses.
Results: The overall incidence rate of spinal fractures in MENA was 111.47 [82.24–157.55] in 2019. Both incidence ($\beta = 0.716$, p value < 0.001) and YLDs ($\beta = 0.616$, p value < 0.001) seemed to be increased annually since 1990, against the decreasing global trend. In general, spinal fractures were more frequent in males. However, in older population, females surpassed males. Although, Afghanistan had the highest incidence (301.15 [130.1–688.01]) and YLDs (20.27 [7.82–48.02]) rate in 2019, Saudi Arabia showed the most significant annual increase compared to other countries (For incidence = $\beta = 0.935$, for YLD = $\beta = 0.960$). Fracture burden had a negative correlation with SDI. The most frequent causes of spinal fractures were conflict and terrorism (33.13%), and falling (30.23%). In some of the countries such as Afghanistan, Palestine, and Syrian Arab Republic conflict and terrorism yielded more than 60% of incident fractures.
Conclusion: The study's findings indicate that the MENA region has an alarming spine fracture epidemiology. It seemed that war-related injuries played a significant role worsening the burden of this fatal fracture. Health professionals and legislators at all levels should be persuaded to include preventative techniques in the program by the gradual increase in spine fractures over the last 30 years.

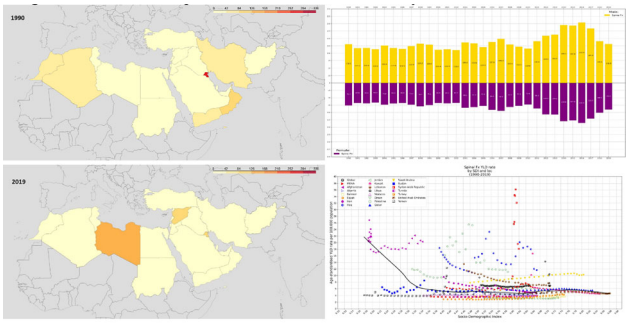


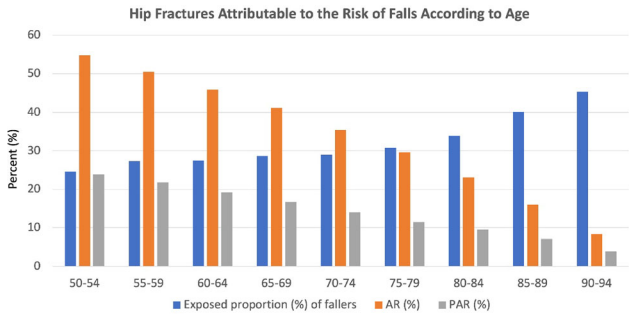
Figure 1. Age-standardized incidence rate of spinal fractures from 1990 to 2019 in male and females across MENA countries. The relationship between SDI and Incidence of spinal fracture is also exhibited.

OC12
DIMINISHING RETURNS OF FALL PREVENTION ON HIP FRACTURE WITH AGE

M. Lorentzon[1], H. Johansson[1], N. Harvey[2], E. Liu[3], M. Schini[4], L. Vandenput[3], E. McCloskey[5], J. Kanis[3]

[1]Sahlgrenska Osteoporosis Centre, Institute of Medicine, University of Gothenburg, Sweden, Mölndal, Sweden, [2]MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, UK, Southampton, United Kingdom, [3]Mary MacKillop Institute for Health Research, Australian Catholic University, Victoria, Australia, Melbourne, Australia, [4]Department of Oncology & Metabolism, Metabolic Bone Centre, Northern General Hospital, University of Sheffield, Herries Road, Sheffield, S5 7AU, UK, Sheffield, United Kingdom, [5]Centre for Metabolic Bone Diseases, University of Sheffield Medical School, UK, Sheffield, United Kingdom

Objectives: We have previously demonstrated in a meta-analysis of 40 cohorts including 606,715 women,[1] that a fall history during the last year was associated with an increased risk of hip fracture. An interaction was observed between fall history and age. The risk of hip fracture in those with a fall history was lower in an 80-year-old woman (HR (95% Confidence Interval) 1.30 (1.23–1.38)) than in a 50-year-old woman (HR 2.21 (1.68–2.90)). Thus, fall history is of lesser importance in the population with the highest hip fracture incidence. This study aimed to determine the population-attributable risk (PAR) for hip fracture due to increased fall risk in women.
Materialsand methods: Fall history associated attributable risk (AR, %) for hip fracture was calculated (100·(1–1/relative risk (HR))) for women per age stratum, using previously calculated HRs.[1] The population attributable risk (PAR,%) of hip fractures in the female population (50 years and older) that could be prevented if the fall history-mediated risk increase could be eliminated, was calculated as $100 \cdot P_{exp} \cdot (HR\text{-}1)/1 + P_{exp} \cdot (HR\text{–}1)]$ where P_{exp} was the exposed proportion of the population (i.e. the proportion fallers).
Results: The proportion of fallers increased progressively with age from 24.6% at age 50–54 years to 45.5% at age 90–94 years. In contrast, the AR due to falls decreased, from 54.8% at age 50–54 years to 8.3% at age 90–94 years, and the PAR, or the proportion of fractures in the total population that could be prevented if the risk increase induced by fall history was eliminated, diminished with age, from 23.9% in women 50–54 years old to 3.9% in women 90–94 years old (Figure).
Conclusions: Despite the increasing proportion of fallers with age, the importance of fall history as a risk factor for hip fracture in women diminishes markedly with age, which results in a much lower PAR in older than in younger women. These results suggest that preventing falls may be a more effective way to reduce hip fracture numbers in younger than older women, who are the most likely to sustain hip fractures.



OC13
PREDICTING THE ONSET OF END-STAGE KNEE OSTEOARTHRITIS OVER TWO- AND FIVE-YEARS USING MACHINE LEARNING

Z. Salis[1], J. Driban[2], T. Mcalindon[3]

[1]University of Geneva, Geneva, Switzerland, [2]UMass Chan Medical School, Worcester, United States, [3]Tufts Medical Center, Boston, United States

Background: Knee Osteoarthritis (KOA) is a leading cause of disability with nearly a quarter of adults over 40 affected worldwide. Despite its widespread impact, no approved pharmacological solution exists to halt, slow, or reverse the progression of KOA. One of the main challenges in the KOA research aiming to find a cure is using total knee replacement (TKR) as an outcome, as many regulatory agencies rely on it to show the improvements in progression in knee osteoarthritis (KOA). However, the decision to undergo TKR is influenced by various factors beyond disease progression, such as education, income, and health insurance. To address these limitations, we recently validated a new outcome, namely, end-stage KOA (esKOA). A knee was classified as having esKOA if it met either of the following criteria: (1) Displaying moderate to severe KOA symptoms (defined as a combined WOMAC pain and disability score of 12 or above) in conjunction with the most severe radiographic KOA (i.e., KL grade = 4, the maximum KL grade); (2) Exhibiting intense KOA symptoms (a combined WOMAC pain and disability score of 23 or more) alongside persistent knee pain and either mild or moderate radiographic KOA (i.e., KL grade = 2 or 3). Unlike TKR incidence, esKOA is an endpoint that represents the advanced stage of KOA, independent of external factors influencing TKR decisions. Furthermore, an esKOA and change in esKOA predict the subsequent occurrence of TKR. Given the lack of a cure, tools that can predict the progression of KOA would be invaluable. Predictive tools can enhance the efficacy of clinical trials by identifying appropriate candidates and ensuring that participants are likely to show disease progression during the trial period.

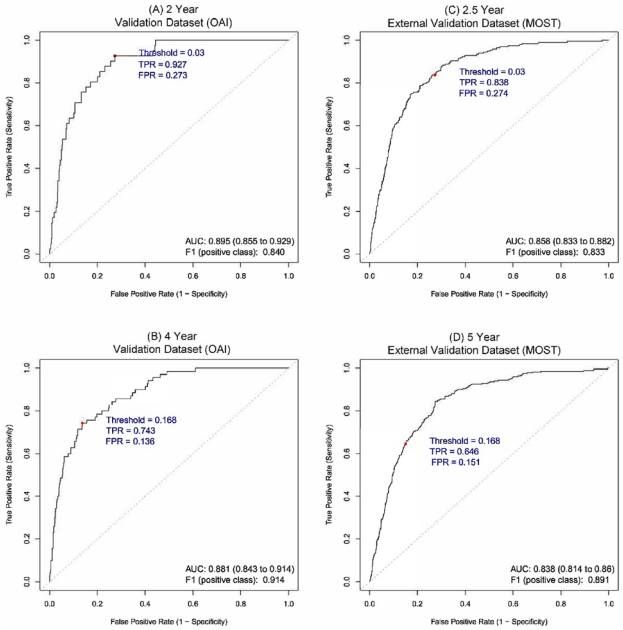
Objectives: To enhance future trials that use esKOA as an outcome, our study focuses on developing and validating a machine-learning tool to identify individuals likely to develop esKOA within 2–5 years. We also aim to implement an online tool delivering the prediction of esKOA for 2 to 5 years based on the developed machine learning algorithm.

Methods: Using the Osteoarthritis Initiative (OAI) data, we trained the models with 3,259 participants and validated them with 616 participants. The Multicenter Osteoarthritis Study (MOST) data, consisting of 1,795participants, was employed for external validation. Our primary outcome was predicting the onset of esKOA at 2-to-2.5 years and 4-to-5 years. Our analysis considered 40 candidate predictors, including demographics, clinical history, physical examination, and X-ray evaluations. We also evaluated the models with top nine predictors among the 40 predictors. Using the models with nine predictors, we developed an online tool that predicts the probability of progression to esKOA at 2-to-2.5 years and 4-to-5 years.

Results: The Area Under Curve (AUC) obtained from external validation (i.e., MOST) using 40 predictors at 2.5 years was 0.861 (95% CI 0.832–0.886), and at 5 years was 0.854 (95% CI 0.830–0.877). The models with nine predictors showed comparable performance (Fig. 1). Using the nine predictors, we developed an online tool that can be found at the following link: https://eskoa.shinyapps.io/tool/.

Conclusion: Our study unveils a robust, externally validated machine learning tool proficient in predicting the onset of esKOA over the next 2 to 5 years. Our screening tool can lead to more efficient KOA trials.

Figure 1. Receiver operating characteristic (ROC) curves showing the performance of models for prediction of
esKOA at 2-to-2.5 years and 4-to-5 years, using nine predictors. A) Validation Dataset (OAI) at 2 years. B)
Validation Dataset (OAI) at 4 years. C) External Validation Dataset (MOST) at 2.5 years. D) External Validation
Dataset (MOST) at 5 years. Red Points show the corresponding True Positive Rate (TPR) and False Positive Rate
(FPR) for the selected thresholds. AUC: Area Under Curve; MOST: Multicenter Osteoarthritis Study; OAI:
Osteoarthritis Initiative.



OC14
MILD COGNITIVE IMPAIRMENT PREDICTS THE ONSET OF SARCOPENIA: A LONGITUDINAL ANALYSIS FROM THE ENGLISH LONGITUDINAL STUDY ON AGEING

F. S. Ragusa[1], L. Dominguez[2], L. Smith[3], F. Bolzetta[4], N. Veronese[1]

[1]University of Palermo, Palermo, Italy, [2]University of Enna Kore, Enna, Italy, [3]Anglia Ruskin University, Cambridge, United Kingdom, [4]ULSS 3 Serenissima, Venice, Italy

Objectives: To investigate whether MCI (mild cognitive impairment) predicts onset sarcopenia in a population of older adults.

Materialsand methods: In this retrospective study, using the data of the ELSA (English Longitudinal Study on Ageing) study, MCI was defined as the absence of dementia, preserved functional capacity and low in three objective cognitive tests. Sarcopenia was diagnosed as having low handgrip strength and low skeletal muscle mass index during follow-up. The longitudinal association between MCI at the baseline and incident sarcopenia was assessed using a multivariable

logistic regression model, reporting the data as adjusted odds ratios (OR) and 95% confidence intervals (95% CI).

Results: 3106 participants were included (mean age of 63.1 years; 55.3% males). People with MCI reported significantly lower mean handgrip strength values and Skeletal Mass Index (SMI) as well as a higher prevalence of obesity at baseline. At the baseline, 729 people were affected by MCI and during ten years of follow-up, 12.1% of the initial population included were affected by sarcopenia. In the multivariate analysis, adjusted for 18 potential confounders, the presence of MCI (OR = 1.236; 95% CI 1.090–1.596, p = 0.01) significantly predicted the onset of sarcopenia during follow-up.

Conclusion: The presence of MCI at baseline was associated with a higher incidence of sarcopenia at ten-years follow-up, demonstrating a probable role of MCI as predictor of onset sarcopenia in older adults.

OC15
COMPARATIVE EFFECTIVENESS OF YOGA AND STRENGTHENING EXERCISE FOR TREATING KNEE OSTEOARTHRITIS: A RANDOMISED CONTROLLED TRIAL (YOGA TRIAL)

B. J. Abafita[1], D. Aitken[1], A. Singh[1], S. Moonaz[2], C. Ding[1], S. Drummen[1], L. Blizzard[1], A. J. Palmer[1], G. Jones[1], K. L. Bennell[3], B. E. Antony[1]

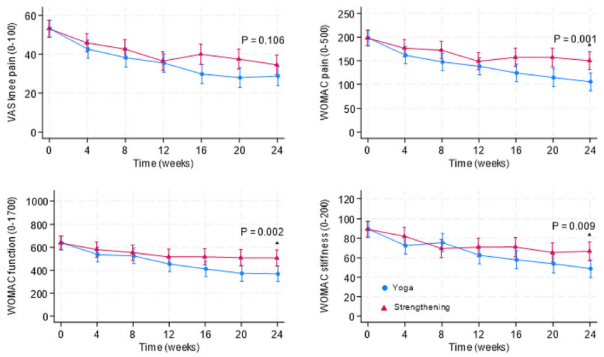
[1]Menzies Institute for Medical Research, University of Tasmania, Hobart, Australia, [2]Department of Clinical and Health Services Research, Southern California University of Health Sciences, Whittier, United States, [3]Centre for Health, Exercise and Sports Medicine, Department of Physiotherapy, School of Health Sciences, University of Melbourne, Melbourne, Australia

Objectives: There is little knowledge about the most effective type, frequency, and dosage of exercise for knee OA. There is also uncertainty about the effect that mind–body exercise, such as yoga, has on knee OA and to date no studies have directly compared yoga with strengthening exercise. We aimed to compare the effectiveness of a 24-week yoga program to a strengthening program in patients with knee OA.

Material and methods: The YOGA trial is an assessor-blinded (for non-patient-reported outcomes), randomised, active-controlled, superiority trial that included a pre-specified non-inferiority margin (visual analog scale (VAS) 10 mm). We recruited knee OA participants aged ≥ 40 years who fulfilled ACR clinical criteria with knee pain ≥ 40 mm on 100 mm VAS. Participants were randomly assigned to a 24-week yoga program or strengthening program, which both included two supervised sessions and one home-based session per week for 1–12 weeks, plus three home-based sessions per week from 13–24 weeks. The primary outcome was change in VAS knee pain over 12 weeks. Secondary outcomes included change in WOMAC scores, patient global assessment, OARSI-OMERACT response, physical performance measures, leg muscle strength, quality of life, depression, and neuropathic pain assessment over 12 and 24 weeks and change in VAS knee pain over 24 weeks.

Results: 117 were randomised to a yoga program (n = 58) or a strengthening program (n = 59). Change in VAS knee pain scores over 12 weeks (between group mean difference − 1.1 mm [95% CI − 7.8 to 5.7]) and 24 weeks (− 5.8 mm [95% CI − 12.8 to 1.2]) were not significantly different between the yoga and strengthening groups. For the secondary outcomes, the yoga group showed significantly greater improvements than the strengthening group over 24 weeks (between-group difference) for WOMAC pain (− 44.5 mm [95% CI − 70.7 to − 18.3]), WOMAC function (− 139 mm [95% CI − 228.3 to − 49.7]), WOMAC stiffness (− 17.6 mm [95% CI − 30.9 to − 4.3]), patient global assessment (− 7.6 mm [95% CI − 15.1 to − 0.2]), and quality of life (0.04 [95% CI 0.0 to 0.07]). Additionally, the yoga group had a significantly greater improvement than the strengthening group in depression (− 1.10 [95% CI − 1.99 to − 0.21]) over 12 weeks. Adverse events were common in both groups and mild in nature.

Conclusion: A 24-week yoga program was non-inferior to a strengthening program, as both groups reported pain reductions that were deemed clinically relevant over 12 weeks. The yoga group reported modestly greater improvements in several secondary outcomes including knee symptoms and quality of life over 24 weeks and depression over 12 weeks, supporting yoga as an effective treatment for knee OA.



Data are estimates from linear mixed-effects models. VAS = visual analogue scale; WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index. VAS knee pain (0 to 100 mm). WOMAC pain (0 to 500 mm). WOMAC function (0 to 1700 mm). WOMAC stiffness (0 to 200 mm).

Figure 1. Mean VAS and WOMAC subscale scores (95%CI) in the yoga and strengthening exercise groups over 24 weeks.

OC16
RADIOGRAPHIC AND PAIN OUTCOMES FROM A PHASE 3 EXTENSION STUDY (OA-07) EVALUATING THE SAFETY AND EFFICACY OF REPEAT LORECIVIVINT INJECTIONS OVER 3 YEARS IN SUBJECTS WITH SEVERE KNEE OSTEOARTHRITIS

Y. Yazici[1], C. Swearingen[1], J. Tambiah[1], T. Mcalindon[2]

[1]Biosplice Therapeutics, Inc, San Diego, United States, [2]Tufts University, Boston, United States

Objectives: Evaluate the safety/efficacy of long-term lorecivivint (LOR) on severe knee osteoarthritis (OA) patient outcomes of medial joint space width (medial JSW)WOMAC Pain and Function.

Material and methods: Knee OA patients (medial JSW 1.5–4 mm) completing a 1-year trial (LOR 0.07 mg vs placebo [PBO]; OA-11, NCT 03928184) were enrolled into extension study OA-07. At Year 1, a repeat injection was given to blinded patients according to original OA-11 randomization. At Year 2, all patients received open-label LOR. Baseline-adjusted ANCOVA estimated differences between LOR and PBO outcomes on OA-07 baseline measures. Treatment effect at Month 36 was estimated using marginal comparison from baseline adjusted ANCOVA to last PBO observation prior to crossover.

Results: 276 patients (mean age 61.0 ± 8.2 years, Body Mass Index 31.8 ± 4.9 kg/m^2, female 62.7%, medial JSW 2.63 ± 0.69 mm, Kellgren-Lawrence [KL] 3 45.3%) were enrolled. Adverse event rates were similar between groups.

Comparing LOR to PBO:

In Full Analysis Set (FAS) completers:

- At 24 months, medial JSW: LOR − 0.11 (± 0.05) mm vs. PBO − 0.20 (± 0.05) mm (Δ = 0.09 mm, 95% CI [− 0.06, 0.23], P = 0.223) (Figure); LOR improvements observed in WOMAC

Pain Δ = − 5.18 (95% CI [− 10.28, − 0.08], P = 0.047) and WOMAC Function Δ = − 4.90 (95% CI [− 9.92, 0.13], P = 0.056).

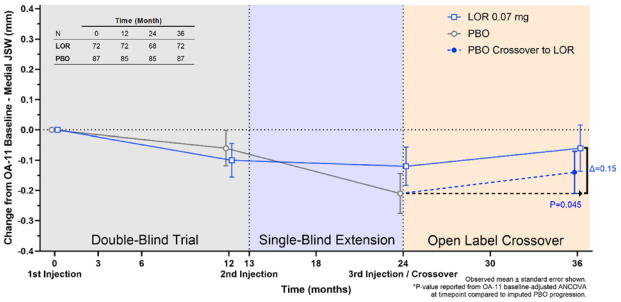
- At 36 months, medial JSW: LOR vs. pre-crossover PBO measure, − 0.06 (± 0.08) mm, (Δ = 15 mm, P = 0.045).

In KL2 FAS completers:

- At 24 months, medial JSW: LOR 0.00 (± 0.06) mm (n = 38) vs. PBO − 0.08 (± 0.06) mm (n = 45) (Δ = 0.08 mm, 95% CI [− 0.09, 0.26], *P* = 0.354).
- At 36 months, medial JSW: LOR vs. pre-crossover PBO measure, 0.17 (± 0.11) mm, (Δ = 29 mm, P = 0.012).

Conclusions: In advanced knee OA patients, LOR 0.07 mg appeared safe. OA-07 met its primary objective with repeat LOR injections (× 3 over 3 years) showing medial JSW improvement vs. PBO. Beneficial LOR effects vs. PBO seen with pain/function outcomes and more pronounced in KL2 patients. PBO patients crossing to LOR showed benefits after 12 months, providing further evidence of efficacy. LOR continues to show promise as a potential disease-modifying knee OA treatment.

Figure. Change in Medial Joint Space Width in OA-07 from OA-11 Baseline



OC17
CURRENT SARCOPENIA DEFINITIONS ARE NOT VALID FOR PREDICTING FALLS AND POOR PHYSICAL FUNCTION IN URBAN DWELLING OLDER ADULTS IN SOUTH AFRICA, THE GAMBIA AND ZIMBABWE: RESULTS FROM THE MUFASSA STUDY

K. A. Ward[1], L. K. Micklesfield[2], L. Gates[1], T. Manyanga[3], M. K. Jallow[4], B. Cassim[5], Y. Madela[5], S. Crozier[1], C. Cooper[1], A. J. Burton[6], H. Wilson[6], R. A. Ferrand[3], C. L. Gregson[6]

[1]MRC Lifecourse Epidemiology Centre, Human Development and Health, University of Southampton, Southampton, United Kingdom, [2]SAMRC/Wits Developmental Pathways for Health Research Unit, School of Clinical Medicine, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa, [3]The Research Unit Zimbabwe, Harare Zimbabwe, Biomedical Training Research Institute, Harare, Zimbabwe, [4]MRC Unit The Gambia @ LSHTM, Banjul, Gambia, [5]Department of Geriatrics School of Clinical Medicine, University of Kwa-Zulu Natal, Durban, South Africa, [6]Musculoskeletal Research Unit, Bristol Medical School, University of Bristol, Bristol, United Kingdom

Objectives: To determine prevalence of sarcopenia, falls and impaired short physical performance battery (SPPB), and whether being sarcopenic is predictive of falls and low SPPB in older adults.
Methods: Population-based sample of sex- and age stratified participants (98% Black African) were recruited in Zimbabwe, (n = 1109), The Gambia (n = 1217) and South Africa (n = 962). All participants had hand grip strength, gait speed, sit-to-stand time and balance measured in the SPPB. Self-reported falls were documented. Prevalence of sarcopenia was defined as: (1) Sarcopenia Definition and Outcomes Committee (SDOC); men: grip strength < 35.5 kg and gait speed < 0.8 m/s; women: < 20 kg & < 0.8 m/s), (2) European Working Group on Sarcopenia II (EWGSOP II) probable sarcopenia; men low grip strength < 27 kg, women < 16 kg. Sensitivity and specificity of each definition to predict falls and low SPPB (< 8) were calculated.
Results: Overall, median (IQR) age was 60 (50, 71) years, 54% were women. Sarcopenia was more prevalent in men than women in all three countries using both SDOC *(men 18%; women 7%)* and EWGSOPII *(men 9%; women 3%)*. Overall, 19% had fallen in the last year, and 32% had a low SPPB. SDOC performed better than EWGSOPII, but sensitivity was low, with poor prediction of fallers *(men sensitivity 23%, specificity 83%; women sensitivity 9%, specificity 94%)* and low SPPB (*men sensitivity 58%, specificity 91%; women sensitivity 16%, specificity 99%)*. EWGSOP II Low grip strength as an indicator for probable sarcopenia performed worse: falls *(men sensitivity 12%, specificity 93%; women sensitivity 3%, specificity 98%)*; SPPB *(men sensitivity 27%, specificity 96%; women sensitivity 5%, specificity 99%)*.
Conclusion: Sarcopenia prevalence was low in women, contrasting with other populations across the globe. Both SDOC and EWGSOPII were poor predictors of falls and of low SPPB. They performed better in men than in women but not to an acceptable level for implementation. These data demonstrate current definitions are not fit for purpose for use in these countries. Determination of thresholds for poor physical function are required to fully understand the prevalence of poor functional ability and its consequences in older adults from African countries.
Funder: UK MRC Grant ref MR/W003961/1; NIHR–Wellcome Partnership for Global Health Research Collaborative Award (217135/Z/19/Z).

OC18
INCREASED RISK OF STROKE IN PATIENTS WITH OSTEOARTHRITIS IN A PROSPECTIVE COHORT OF MEN: THE STRAMBO STUDY

M. A. Auroux[1], R. Chapurlat[1], P. Szulc[2]

[1]Hospices Civils de Lyon, Lyon, France, [2]INSERM U1033, Lyon, France

Objectives: Osteoarthritis (OA) and cardiovascular disease share risk factors, including age, obesity, diabetes and the metabolic syndrome. The impact of osteoarthritis on cardiovascular and especially cerebrovascular outcomes is still debatted with some studies suggesting a causal role of OA in cardiovascular outcomes *(Zhao* et al., *Ost And Cart, 2022; Wang* et al., *Front Cardiovasc, 2022)*. The underlying mechanisms are yet not fully identified but possibly mediated partially by pro-inflammatory mediators secreted during the OA process, the genetic background and the limitation of physical activity induced by OA. Our aim was to assess the association between OA and the risk cardiovascular or cerebrovascular events in a cohort of older men followed prospectively for 8 years.
Material and methods: The STRAMBO study has involved men with age ranging from 60 to 87 years at baseline. We examined the relationship between joint replacement due to OA before baseline and incident cardiovascular events. Prior joint replacement due to fracture was not included. Major adverse cardio- and cerebrovascular event (MACCE)—were defined as an acute coronary syndrome (ACS), stroke or sudden death probably of cardiovascular origin. ACS comprised myocardial infarction, cardiac arrest and unstable angina necessitating emergency intervention). Events were self-reported by participants or their proxy and then confirmed by a health professional.
The association between OA and the risk of outcomes was assessed using a Cox model adjusted for age, BMI, occupational physical activity, smoking, ischaemic heart disease, hypertension, abdominal

aortic calcification, treatment with statins, treatment with vitamin K antagonists. Other potential relevant comorbidities such as diabetes or leisure physical activity were not included in the model because they were not significant predictors.

Results: The mean age and BMI of 816 men were 72 years and 27.6 kg/m^2. Among them, 49 men have reported joint replacement due to OA at baseline (18 knees, 30 hips, 6 shoulders, 6 men had two joint replacements). Men who had joint replacement were older and heavier. They more often self-reported high occupational physical activity, ischaemic heart disease, diabetes mellitus, and the treatment with beta blockers).

During the study period, 90 men had incident MACCE, with a median [interquartile range] follow-up time to event of 51.6 months [27.5; 71.0]. Men who sustained incident MACCE were at baseline older. They more often self-reported high occupational physical activity, ischaemic heart disease, diabetes mellitus as well as the treatment with vitamin K antagonists and with calcium channel blockers. The risk of MACCE among men with joint replacement due to OA was higher compared with the controls (HR = 3.12, 95% CI 1.74–5.58, $p < 0.001$). Men with OA had increased HR for stroke of 4.94 (95% CI 1.96; 12.42, $p < 0.001$) with a median follow-up time to event of 51.0 month [23.3; 72.9].

We did not observed such an association for ACS (HR = 1.30, 95% CI 0.49; 3.40, p = 0.60) or for myocardial infarction (n = 29, HR = 1.35, 95% CI 0.39; 4.68, p = 0.64).

Conclusions: Late stage OA, defined by joint replacement, was associated with an increased risk of stroke in a prospectively followed cohort of men, after adjustment for relevant confounders. Despite the observational nature of our work, our results support the concept that OA is also a marker of poor health and could play a role in cardiovascular events. Cardiovascular risk assessment could be considered in the management of OA patients. Our results are consistent with other studies linking OA and the cardiovascular risk.

Table 1: Participants characteristics according to the prosthesis

	Prosthesis (n = 49)	Controls (n = 767)	p*	p**
Age (kg)	76.6 ± 6.7	71.8 ± 7.3	<0.001	
Weight (kg)	82 ± 13	78 ± 11	<0.05	<0.005
Height (cm)	166 ± 6	168 ± 6	<0.05	0.34
BMI (kg/m^2)	29.6 ± 4.2	27.5 ± 3.5	<0.001	<0.001
Smoking: current	2 (4.1%)	47 (6.1%)	0.68	
former	33 (67.4%)	473 (61.6%)		
never	14 (28.5%)	247 (32.3%)		
Alcohol intake (g/week)	109 [31; 234]	109 [16; 234]	0.68	
Occupational physical activity very low	4 (8.2%)	167 (21.4%)	<0.001	<0.005
low	8 (16.3%)	234 (30.5%)		
medium	26 (53.1%)	204 (26.6%)		
high	11 (22.4%)	162 (21.1%)		
Leisure physical activity (h/week)	2 [0; 7]	3 [0; 8]	0.74	
Ischaemic heart disease (n, %)	14 (28.6%)	115 (14.9%)	<0.01	0.07
Systolic blood pressure (mm Hg)	136 ± 15	134 ± 16	0.61	
Prior stroke (n, %)	3 (6.1%)	30 (3.9%)	0.44	
Parkinson's disease (n, %)	0 (0%)	15 (1.9%)	0.33	
Diabetes mellitus (n, %)	11 (22.4%)	83 (10.7%)	<0.05	<0.05
COPD (n, %)	3 (6.1%)	48 (6.2%)	0.98	
Prior major elective surgery (n, %)	8 (16.3%)	108 (14.0%)	0.65	
Abdominal aortic calcification score	2 [0; 7]	1 [0; 4]	<0.05	0.44
Glomerular filtration rate (mL/min)	68.9 ± 18.1	70.8 ± 15.2	0.34	
Statins (n, %)	17 (34.7%)	199 (25.7%)	0.17	
Vitamin K antagonists (n, %)	6 (12.2%)	42 (5.4%)	<0.05	0.11
Angiotensin receptor blocker (n, %)	7 (14.3%)	137 (17.7%)	0.54	
ACE inhibitor (n, %)	12 (24.5%)	105 (13.6%)	<0.05	0.06
Beta blockers (n, %)	14 (28.6%)	108 (14.0%)	<0.01	<0.05
Calcium channel blocker (n, %)	10 (20.4%)	114 (14.8%)	0.28	
SSRI (n, %)	2 (4.1%)	33 (4.3%)	0.95	
Diuretics (n, %)	17 (34.7%)	186 (24.1%)	0.10	

BMI = Body Mass Index, COPD = Chronic Obstructive pulmonary disease, ACE = Angiotensin Conversion Inhibitor, SSRI = Selective Serotonin Reuptake Inhibitor
p* = unadjusted p-value, p** = adjusted p-value

Table 2: Participants characteristics according to the MACCE

	MACCE (n = 90)	Controls (n = 726)	p*	p**
Age (kg)	75.2 ± 7.0	71.8 ± 7.3	<0.001	
Weight (kg)	78 ± 12	78 ± 11	0.51	
Height (cm)	167 ± 6	169 ± 6	<0.05	0.34
BMI (kg/m^2)	27.8 ± 3.4	27.6 ± 3.6	0.64	
Smoking: current	8 (8.9%)	41 (5.6%)	0.46	
former	54 (60.0%)	452 (62.2%)		
never	28 (31.1%)	233 (32.2%)		
Alcohol intake (g/week)	63 [0; 219]	109 [16; 234]	0.68	
Occupational physical activity very low	5 (5.6%)	166 (22.9%)	<0.001	<0.005
low	27 (30.0%)	215 (29.6%)		
medium	27 (30.0%)	203 (28.0%)		
high	31 (34.4%)	142 (19.5%)		
Leisure physical activity (h/week)	4 [0; 7]	3 [0; 8]	0.73	
Ischaemic heart disease (n, %)	25 (27.8%)	104 (14.2%)	<0.001	<0.01
Systolic blood pressure (mm Hg)	138 ± 18	134 ± 16	<0.05	0.06
Prior stroke (n, %)	2 (2.2%)	31 (4.2%)	0.36	
Parkinson's disease (n, %)	1 (1.1%)	14 (1.9%)	0.59	
Diabetes mellitus (n, %)	19 (21.1%)	75 (10.2%)	<0.005	<0.05
COPD (n, %)	9 (10.0%)	42 (5.7%)	0.11	
Prior major elective surgery (n, %)	11 (12.5%)	105 (14.3%)	0.64	
Abdominal aortic calcification score	2 [1; 7]	1 [0; 3]	<0.001	<0.05
Glomerular filtration rate (mL/min)	67.3 ± 16.2	71.1 ± 15.2	<0.05	0.58
Statins (n, %)	28 (31.1%)	188 (25.7%)	0.26	
Vitamin K antagonists (n, %)	13 (14.4%)	35 (4.8%)	<0.001	<0.005
Angiotensin receptor blocker (n, %)	18 (20.0%)	126 (17.2%)	0.51	
ACE inhibitor (n, %)	18 (20.0%)	99 (13.5%)	0.10	
Beta blockers (n, %)	17 (18.9%)	105 (14.3%)	0.25	
Calcium channel blocker (n, %)	24 (26.7%)	100 (13.6%)	<0.005	<0.005
SSRI (n, %)	6 (6.7%)	29 (4.0%)	0.23	
Diuretics (n, %)	23 (25.6%)	180 (24.6%)	0.84	

BMI = Body Mass Index, COPD = Chronic Obstructive pulmonary disease, ACE = Angiotensin Conversion Inhibitor, SSRI = Selective Serotonin Reuptake Inhibitor
p* = unadjusted p-value, p** = adjusted p-value

OC19
DXA-DERIVED HIP SHAPE IS PREDICTIVE OF HIP FRACTURE: A LONGITUDINAL STUDY FROM UK BIOBANK

S. Scott[1], A. Hashmi[1], R. Ebsim[2], F. R. Saunders[3], J. S. Gregory[3], R. M. Aspden[3], C. Lindner[2], T. Cootes[2], N. C. Harvey[4], J. H. Tobias[5], B. G. Faber[5], R. Beynon[5]

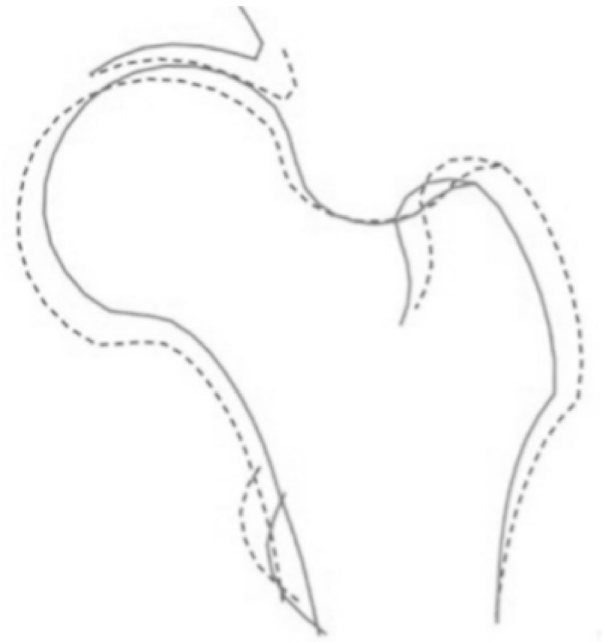
[1]University of Bristol, Bristol, United Kingdom, [2]Division of Informatics, Imaging and Data Science, University of Manchester, Manchester, United Kingdom, [3]Centre for Arthritis and Musculoskeletal Health, University of Aberdeen, Aberdeen, United Kingdom, [4]Medical Research Council Lifecourse Epidemiology Unit, University of Southampton, Southampton, United Kingdom, [5]Musculoskeletal Research Unit, University of Bristol, Bristol, United Kingdom

Objective: Despite major advances in osteoporosis management, hip fractures remain a notable consequence of bone fragility, with a one-year mortality rate of 20%. The aim of this study was to investigate whether dual-energy X-ray absorptiometry (DXA) derived hip shape is predictive of hip fracture, independent of bone mineral density (BMD).

Material and methods: Statistical shape modelling was applied on left hip DXA scans of participants in the UK Biobank (approved application 17295), a large prospective cohort linked to electronic healthcare records. Ten orthogonal hip shape modes (HSM) explained 86% of shape variance. Cox proportional hazard models were used to examine the longitudinal associations between each HSM and hospital diagnosed hip fractures. Adjustments were made for age, sex,

height, weight, and total hip BMD. A Bonferroni adjusted p-value threshold ($p < 0.005$) was used to account for the ten HSMs tested.
Results: Our study included 40,305 participants (mean age 63.7 years; 52.1% female; mean follow up time 5 years). 153 individuals (0.38%) had a hospital diagnosed hip fracture. HSM2, characterised by a narrower femoral neck and a higher femoral neck shaft angle (Fig. 1), showed strong evidence of an association to hip fracture (HR: 1.35, 95% confidence interval (CI): 1.14–1.59, p value 0.0005). In the fully adjusted model, the association was maintained (HR: 1.31, 95% CI 1.11–1.55, p value 0.002). There was no evidence for other HSMs being associated with hip fracture.
Conclusion: In this longitudinal study, we identified an association between DXA-derived hip shape and hip fracture that was independent of total hip BMD, showing that hip shape could be an important predictor of hip fracture. These findings suggest the potential for hip shape, derived automatically from DXA scans, to be included within risk assessment tools to further improve their predictive ability and targeted interventions to prevent hip fractures.

Figure 1: HSM2 solid line +2 SDs, dotted line -2 SDs



OC20
GREATER THIGH MUSCLE MASS MEASURED BY MRI IS ASSOCIATED WITH REDUCED INCIDENT FRACTURE RISK IN WOMEN, BUT NOT MEN: FINDINGS FROM THE UK BIOBANK

E. M. Curtis[1], S. D'Angelo[1], R. J. Moon[1], J. Paccou[2], N. R. Fuggle[1], E. M. Dennison[1], C. Cooper[1], K. A. Ward[1], N. C. Harvey[1]

[1]MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom, [2]Université Lille Nord-de-France, Lille, France

Objectives: Several studies have demonstrated that the modest predictive value of dual-energy x-ray absorptiometry derived appendicular lean mass (DXA-ALM) for incident fractures is attenuated (and potentially inverted) after adjustment for bone mineral density (BMD). We therefore investigated associations between a gold-standard measure of muscle quantity, MRI thigh muscle volume (MRI-TMV), and incident fractures.
Methods: In the UK Biobank Imaging Study participants underwent MRI examination, from neck to knees. Automated analysis was performed using the AMRA Profiler^{TM} system, to segment total thigh muscle volume (TMV), visceral adipose tissue (VAT) and abdominal subcutaneous adipose tissue (ASAT). We used Cox regression to calculate hazard ratio for any incident fractures per standard deviation greater MRI-TMV/height^2, in men and women separately, adjusting for age, Townsend deprivation score, ethnicity, prior fracture, alcohol consumption and smoking in all models, and then additionally for VAT, ASAT, body mass index (BMI) or heel quantitative ultrasound estimated (e)BMD. Participants were followed until first fracture, death, loss to follow-up or 30/9/2021.
Results: There were 25,117 participants (mean age 62.3 and 63.8 years in women and men respectively) with an MRI-TMV measure, undertaken between 2014 and 2018. There were 308 incident fractures in women (2.4%) and 200 in men (1.7%).
Greater TMV/height^2 was associated with decreased risk of any fracture in women [HR 0.82, 95% CI (0.70, 0.97)], but with a trend towards an increased risk of fracture in men [HR 1.17 (0.94, 1.46)]. Adjustment for measures of adiposity, such as VAT, ASAT or BMI did not change the observed associations in women but strengthened them in men [e.g. in men, with adjustment for BMI, HR 1.39 (1.07, 1.81)]. Adjustment for eBMD did not alter the findings.
Conclusions: The pattern of these findings is similar to that with DXA-ALM, supporting further investigation into possible causal, rather than measurement specific, associations between greater muscle mass and higher fracture risk in men. This work was undertaken using the UK Biobank resource under approved application 3593.

OC21
HIP GEOMETRY AND FRACTURE AMONG IRISH MEN AND WOMEN: THE DXA HIP PROJECT

M. Ebrahimiarjestan[1,2], E. E.[3], A. Brennan[4], L. Yang[5], T. Wang[6], C. Silke[2,7], M. O'Sullivan[2,7], M. Dempsey[8], M. Yu[1], J. Carey[2,9], G. O'Malley[10], A. Mcpartland[7], B. Rooney[10]

[1]Department of Industrial Engineering, Tsinghua University, Beijing, China, [2]School of Medicine, National University of Ireland, Galway, Ireland, [3]School of Management, Guangxi Minzu University, Nanning, China, Nanning, China, [4]School of Computer Science, National University of Ireland, Galway, Ireland, [5]Insight SFI Research Centre for Data Analytics, Data Science Institute, Galway, Ireland, [6]Nuffield Department of Medicine, University of Oxford, Oxford, United Kingdom, Oxford, United Kingdom, [7]Department of Rheumatology, Our Lady's Hospital, Manorhamilton, Ireland, [8]School of Engineering, National University of Ireland, Galway, Ireland, [9]Department of Rheumatology, University Hospital Galway, Galway, Ireland, [10]Department of Geriatric Medicine, Sligo University Hospital, Sligo, Ireland.

Background: Osteoporosis is one of the most prevalent non-communicable diseases worldwide manifest clinically as fractures. These can have devastating consequences, in particular hip fractures. Ireland has one of the highest rates of hip fracture in the world, yet few Irish studies examined the relationship between DXA biometrics and hip fracture.
Methods: We used data from a previously described research cohort, The DXA HIP Project, to perform a case–control study to examine the relationship between DXA femoral bone mineral density (BMD) and geometric parameters to hip fractures among adults $\geq$ 40 years in Ireland. First we compared clinical characteristics and DXA biometrics of hip fracture patients to two cohorts: (i) healthy control group and (ii) those with risk factors but without a hip fracture. Then we performed a case–control study matching by using the propensity

score matching method(1;4) for healthy controls for age, gender and body mass index (BMI) to each adult with a hip fracture.
Results: Clinical data and hip BMD were available for 29,110 subjects including 9108 healthy controls, 7748 subjects with major risk factors for fracture or osteoporosis and 691 cases of hip fracture. DXA derived advanced hip assessments (AHA) were available for 12,203 subjects including 4121 healthy controls, 7748 with major risk factors and 334 with a hip fracture. Adults with hip fractures were significantly older, had lower BMI, femoral neck and total hip BMD than those without hip fractures, but were twice as likely to be receiving osteoporosis medication, $p < 0.001$ for all comparisons. Similarly, among those subjects with available AHA those with hip fractures were older, had significantly lower BMI and BMD than both healthy controls and those with risk factors. In addition, subjects with hip fractures had significantly greater hip axis length (HAL) and buckling ratio (BR), but lower cross-sectional area (CSA), cross-sectional moment of inertia (CSMI) and strength index (SI), p value < 0.001. After matching, cases of hip fracture had significantly greater HAL and BR, but significantly lower femoral neck and total hip BMD, CSA and SI, p-value < 0.001. Although CSMI was also lower, the p value was greater than our pre-specified level at 0.028.
Conclusions: Irish adults with hip fractures are generally older and have lower BMI and BMD than healthy controls and those with other risk factors. Additional DXA hip geometric measures are also significantly associated with hip fractures in our population which could help in identifying those most at risk for hip fracture. Large prospective studies are needed to support these findings.

OC22
COST-EFFECTIVENESS OF RADIOFREQUENCY ECHOGRAPHIC MULTI SPECTROMETRY (REMS) FOR THE DIAGNOSIS OF OSTEOPOROSIS IN THE UNITED STATES

J.-Y. Reginster[1], M. Hiligsmann[2]

[1]University of Liège, Liège, Belgium, [2]Maastricht University, Maastricht, Netherlands

Objective: Radiofrequency Echographic Multi Spectrometry (REMS) is an innovative non-ionizing approach that has demonstrated a good level of accuracy and precision, supporting the use of this technology to enhance osteoporosis diagnosis in the clinical routine as an alternative to DXA. Given the increasing importance of economic considerations in healthcare decision-making, this study was designed to estimate the cost-effectiveness and economic consequences of an improved diagnosis with REMS followed by treatment in the United States.
Methods: A microsimulation-based Markov model was designed to estimate the cost (expressed in US$2022) per quality-adjusted life year (QALY) gained of REMS followed by treatment compared to no diagnosis/treatment in US women aged 50 years and over with osteoporosis. Women were classified as being at high risk (and receiving alendronate monotherapy for 5 years), or at very high risk (and receiving an anabolic treatment for 18 months (ie. abaloparatide) followed by alendronate 5 years). The potential impact of a 5% increase in the diagnosis and treatment of US osteoporotic women aged over 50 years through REMS was estimated in terms of QALY and life years gained and fractures prevented.
Results: REMS is associated with improved health outcomes (more QALYs and less fractures) and reduced fracture costs compared to no diagnostic. The incremental cost-effectiveness ratio of REMS was estimated at $50,167 per QALY gained, far below the US cost-effectiveness thresholds of $100,000–150,000. The cost per QALY gained remains favorable ($69,292 per QALY gained) when assuming that only 10% of people receiving REMS are treated. A 5% increase in the diagnosis and treatment of the osteoporosis women population at high and very high risk of fractures aged over 50 years with REMS would save about 30,000 life years (undiscounted), 43,500 QALY (ie. years in perfect health; discounted) and 100,000 fractures over lifetime.
Conclusion: REMS is a cost-effective strategy for the diagnosis of osteoporosis treatment in the US with substantial potential economic benefits.
Acknowledgements: This study was funded by an unrestricted educational grant from Echolight.

OC23
EXTERNAL VALIDATION OF AI-DRIVEN BONE FRAGILITY DETECTION IN RADIOGRAPHS FROM MULTINATIONAL COHORTS

G. Gatineau[1], G. Nguyen[2], M. Degruttola[2], K. Hind[2], M. Kužma[3], J. Payer[3], G. Guglielmi[4], A. Fahrleitner-Pammer[5], D. Hans[1]

[1]Center of Bone Diseases, Rheumatology Unit, Bone and Joint Department, Lausanne University Hospital, & University of Lausanne, Lausanne, Switzerland, [2]Medimaps group SA, Plan-Les-Ouates, Switzerland, [3]Comenius University Faculty of Medicine, 5th Department of Internal Medicine, University Hospital, Bratislava, Slovakia, [4]Department of Clinical and Experimental Medicine, Foggia University School of Medicine, Foggia, Italy, [5]Medical University Graz, Department for Internal Medicine, Division for Endocrinology and Diabetology, Graz, Austria

Objective: Globally, over 9 million fragility fractures occur each year and one of the major challenges in the osteoporosis field is that most people who sustain a fragility fracture have not been assessed for osteoporosis, and/or are not receiving treatment. Therefore, additional approaches to identify those at risk are needed. This investigation aimed to evaluate a new AI-powered radiographic analysis tool designed to opportunistically identify individuals predisposed to an elevated risk of severe bone fragility, addressing a persistent clinical challenge within the domain.
Materialsand methods: A total of 4764 pairs of lumbar-spine X-ray DICOM and DXA scans (GE and Hologic systems), each acquired within 6-months interval, were identified from four multinational cohorts. A total of 3369 cases from three cohorts were allocated to the training and validation of a newly developed multi-stage AI-bone fragility detection tool (Medimaps Group, Switzerland). An independent internal test set comprising 300 cases was created, and the fourth cohort, consisting of 271 cases, served as an external test set. The identification of very high fragility risk relied on DXA parameters as the ground truth: BMD T-score $\leq$ -2.5 and trabecular bone score (TBS) $\leq$ 1.23. Uncertainties were calculated with a 95% confidence interval (CI) using binomial distribution approximations.
Results: The global sample mean age and BMI were 66.1 ± 10.8 years and 26.4 ± 5.0 kg/m^2 respectively. The prevalence of very high fragility risk was 17.5%. The AI tool's performance in the internal test set indicated an accuracy of 0.85 (95% CI 0.76–0.94), specificity of 0.91 (0.8–0.99), and sensitivity of 0.69 (0.53–0.84). The external validation demonstrated an accuracy, specificity, and sensitivity of 0.80 (0.69–0.87), 0.88 (0.77–0.99), and 0.62 (0.47–0.77), respectively.
Conclusion: This study validates the effectiveness of an automatic AI X-ray image processing application for the opportunistic screening of patients for very high fragility risk of lumbar spine, using DXA as the ground-truth. Its robust specificity underscores its capacity to reduce false-positive rates, emphasizing its clinical utility for efficient patient screening. While this study demonstrates promise, further development and validation will be beneficial, using larger and more diverse samples.

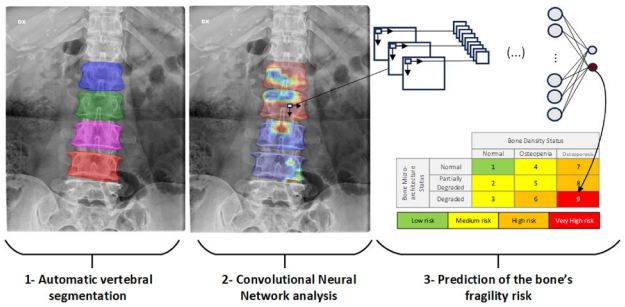


Figure 1: Multi-stage deep-learning application for the opportunistic screening of bone's fragility risk from X-ray

OC24
VITAMIN D METABOLITE RATIO (VMR) OFFERS THE BEST APPROACH TO EVALUATE FUNCTIONAL VITAMIN D DEFICIENCY: RESULTS OF THE SARCOPHAGE STUDY

A. Ladang[1], A.-S. Gendebien[1], S. Kovacs[1], C. Demonceau[2], C. Beaudart[3], C. Le Goff[1], J.-Y. Reginster[4], O. Bruyère[2], N. M. Al-Daghri[5], M. S. Alokail[4], E. Cavalier[1]

[1]CHU de Liège/Clinical chemistry, Liège, Belgium, [2]WHO Collaborating Centre for Public Health Aspects of Musculoskeletal Health and Aging, Division of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium, [3]Clinical Pharmacology and Toxicology Research Unit (URPC), NARILIS, Department of Biomedical Sciences, University of Namur, Namur, Belgium, [4]Protein Research Chair, Biochemistry Dept, College of Science, King Saud University, Riyadh, Saudi Arabia, [5]Chair for Biomarkers of Chronic Diseases, Biochemistry Department, College of Science, King Saud University, Riyadh, Saudi Arabia.

Backgrounds: The vitamin D metabolite ratio (VMR) has recently shown to be a best indicator of vitamin D deficiency than 25-hydroxyvitamin D (25(OH)VTD) alone. This study aims at validating these results in a large independent cohort of older individuals.
Methods: The SarcoPhAge cohort is a Belgian cohort of community-dwelling older adults. 25(OH)VTD and 24.25$(OH)_2$VTD were measured on 204 sera collected at the second follow-up using liquid chromatography-tandem mass spectrometry CDC certified method. VMR was calculated according the formula: VMR = (24.25($OH)_2$VTD/25(OH)VTD) × 100.
Results: According to cut-offs for vitamin D deficiency established in the literature, 35 individuals (17.2%), 40 individuals (19.6%) and 19 individuals (9.3%) had 25(OH)VTD < 20 ng/mL, 24.25$(OH)_2$VTD < 1.2 ng/mL and VMR < 4%, respectively. 25(OH)VTD, 24.25$(OH)_2$VTD and VMR were all independently associated with PTH but the best association was observed with VMR (rho: − 0.292; p value < 0.0001). When categorizing 25(OH)VTD, 24.25(OH)2VTD, and VMR into quartiles, it was observed that only 24.25(OH)2VTD and VMR exhibited a noteworthy elevation in PTH levels across quartiles (p = 0.002 and p < 0.0001, respectively). Additionally, VMR was independently associated with appendicular lean mass (rho: − 0.220; p value = 0.0018) and BMI (rho: − 0.173; p value = 0.0156) but not with fat mass.
Conclusions: In this study, we confirmed that VMR is the best biomarker to study functional deficiency of vitamin D.

OC25
CALCITRIOL SUPPLEMENTATION AFTER KIDNEY TRANSPLANTATION: RESULTS OF A DOUBLE-BLINDED, RANDOMIZED, PLACEBO-CONTROLLED TRIAL

P. K. Khairallah[1], S. S. Sammons[2], S. A. Agarwal[2], N. C. Cortez[3], M. F. Fusaro[4], M. P. Plebani[4], M. Z. Zaninotto[4], C. C. Cosma[4], T. N. Nickolas[2]

[1]Baylor College of Medicine, Houston, United States, [2]Columbia University, New York, United States, [3]University of Turin, Turin, Italy, [4]University of Padova, Padua, Italy

Objective: Vitamin D deficiency is highly prevalent following kidney transplantation (KT) and results in bone loss. We performed a randomized placebo-controlled trial of calcitriol administration in the 1st 12 months post-KT hypothesizing that calcitriol preserves bone quality and strength.
Methods: Participants > 18 yo undergoing a first KT were recruited from at Columbia University between 2013 and 2015. Participants were randomized 1:1 to either daily placebo or daily calcitriol 0.5 mcg. All participants received cholecalciferol 1000 IU daily. Participants had labs and imaging at baseline (pre-KT) and 12 months post-KT. Areal bone mineral density (BMD) was measured by DXA at the spine, hip and forearm. Cortical and trabecular volumetric BMD, microarchitecture, geometry, total bone strength, and vascular calcifications were measured by high resolution peripheral QCT (HRpQCT) at the radius and tibia. Primary analyses were intent to treat.
Results: The study included 32 and 29 participants in the calcitriol and placebo group respectively. In the calcitriol and placebo groups: mean ± sd age was 51 ± 14 and 51 ± 13 yrs; 67% and 70% were male; and 100% and 97% were Caucasian respectively. PTH declined − 63 ± 11% in calcitriol and − 62 ± 6% in placebo (p < 0.001 for both); there was no between-group difference (p = 0.9). BSAP increased 63 ± 36% in placebo and 9.6 ± 13.2 in calcitriol; CTX decreased by − 69 ± 7% in placebo and by − 77 ± 5% in calcitriol; there were no between-group difference for either (p = 0.8, p = 0.3, respectively). There were no within or between group differences in changes to areal BMD by DXA or to geometry, microarchitecture or mechanical estimates of bone strength by HRpQCT (Table 1). Hypercalcemia occurred in 39% and 3% in the calcitriol and placebo groups respectively (p < 0.001) but vascular calcification did not progress (p > 0.05).
Conclusion: Compared to placebo, calcitriol administration during the first 12 months of KT did not affect skeletal measures. These findings suggest that the addition of calcitriol to cholecalciferol in KT recipients does not improve skeletal health but causes hypercalcemia.

	Calcitriol				Placebo				
DXA Measures (mean+/- sd)	**T0**	**T12**	**% change (mean +/- SEM)**	**p-value**	**T0**	**T12**	**% change (mean +/- SEM)**	**p-value**	**p-value calcitriol vs. placebo**
BMD Lumbar spine	1.07 +/- 0.03	1.08 +/- 0.04	1.91 +/- 0.94	0.8	1.01 +/- 0.03	1.01 +/- 0.03	0.90 +/- 1.09	0.9	0.5
BMD Total hip	0.95 +/- 0.03	0.96 +/- 0.03	1.19 +/- 0.86	0.7	0.94 +/- 0.04	0.92 +/- 0.04	0.11 +/- 1.04	0.7	0.4
BMD Femoral Neck	0.77 +/- 0.03	0.78 +/- 0.03	1.06 +/- 1.22	0.8	0.77 +/- 0.04	0.75 +/- 0.04	-0.15 +/- 1.43	0.6	0.5
BMD 1/3 radius	0.76 +/- 0.02	0.75 +/- 0.02	-0.44 +/- 0.41	0.9	0.76 +/- 0.02	0.75 +/- 0.02	-0.74 +/- 0.47	0.9	0.6
BMD Ultradistal radius	0.47 +/- 0.02	0.46 +/- 0.02	-3.08 +/- 1.16	0.9	0.47 +/- 0.02	0.45 +/- 0.02	-3.35 +/- 1.02	0.5	0.9
HRpQCT (mean +/- sd)	**T0**	**T12**	**% change (mean +/- SEM)**	**p-value**	**T0**	**T12**	**% change (mean +/- SEM)**	**p-value**	**p-value calcitriol vs. placebo**
Radius Tb.vBMD	156 +/- 50	150 +/- 49	-4.0 +/- 1.6	0.6	154 +/- 55	141 +/-52	-4.5 +/- 1.4	0.4	0.8
Radius Ct. vBMD	872 +/- 70	876 +/- 15	-0.3 +/- 0.6	0.8	895 +/- 52	888 +/- 51	-0.31 +/- 0.64	0.7	1.0
Radius Stiffness	80886 +/- 27977	78132 +/- 28344	-5.4 +/- 1.4	0.7	79173 +/- 33659	72647 +/- 32163	-3.40 +/- 1.20	0.5	0.3
Radius Failure Load	3980 +/- 1341	3812 +/- 1362	-5 +/- 1	0.6	3889 +/- 1653	3551 +/- 1549	-3.23 +/- 1.30	0.5	0.3
Tibia Tb.vBMD	154 +/- 46	151 +/- 46	-4.2 +/- 1.6	0.8	153 +/- 49	144 +/- 45	-1.56 +/- 1.78	0.5	0.3
Tibia Ct. vBMD	875 +/- 81	878 +/- 17	0.03 +/- 0.8	0.9	871 +/- 70	856 +/- 78	-1.12 +/- 0.62	0.5	0.3
Tibia Stiffness	200381 +/- 57669	1987-3 +/- 56949	-1.8 +/- 1.5	0.9	195540 +/- 69233	179531 +/-	-2.43 +/-2.14	0.4	0.8
Tibia Failure Load	10115 +/- 2669	9963 +/- 2653	-1.9 +/- 1.2	0.8	9878 +/- 3307	9089 +/- 3016	-2.41 +/- 1.97	0.4	0.8

OC26
FRACTURE LIAISON SERVICES AND SUBSEQUENT FRACTURE RISK: A MULTICENTER, PRAGMATIC, STEPPED-WEDGE CLUSTER-RANDOMIZED CONTROLLED TRIAL

C. Andreasen[1], C. Dahl[2], F. Frihagen[3], T. T. Borgen[4], T. Basso[5], J. E. Gjertsen[6], W. Figved[7], T. Wisløff[8], G. Hagen[9], E. M. Apalset[10], J. M. Stutzer[11], I. Lund[12], A. K. Hansen[1], F. I. Nissen[1], R. M. Joakimsen[13], U. Syversen[14], E. F. Eriksen[15], L. Nordsletten[8], T. K. Omsland[2], Å. Bjørnerem[13], L. B. Solberg[12]

[1]Department of Orthopedic Surgery, University Hospital of North Norway, Tromsø, Norway, [2]Department of Community Medicine and Global Health, Institute of Health and Society, University of Oslo, Oslo, Norway, [3]Department of Orthopedic Surgery, Østfold Hospital Trust, Grålum, Norway, [4]Department of Rheumatology, Vestre Viken Hospital Trust, Drammen, Norway, [5]Department of Orthopedic Surgery, St. Olavs University Hospital, Trondheim, Norway, [6]Department of Orthopedic Surgery, Haukeland University Hospital, Bergen, Norway, [7]Department of Orthopedic Surgery, Vestre Viken Hospital Trust, Bærum Hospital, Gjettum, Norway, [8]Institute of Clinical Medicine, University of Oslo, Oslo, Norway, [9]Department of Health Services, Norwegian Institute of Public Health, Oslo, Norway, [10]Bergen group of Epidemiology and Biomarkers in Rheumatic Disease, Department of Rheumatology, Haukeland University Hospital, Bergen, Norway, [11]Department of Orthopedic Surgery, Møre and Romsdal Hospital Trust, Hospital of Molde, Molde, Norway, [12]Division of Orthopedic Surgery, Oslo University Hospital, Oslo, Norway, [13]Department of Clinical Medicine, The Arctic University of Norway, Tromsø, Norway, [14]Department of Clinical and Molecular Medicine, Norwegian University of Science and Technology, Trondheim, Norway, [15]Spesialistsenteret Pilestredet Park, Oslo, Norway

Objective: We investigated the effect of a standardized Fracture Liaison Service (FLS) intervention on subsequent fracture risk and mortality.
Material and methods: The study was a multicenter, pragmatic, stepped-wedge cluster-randomized trial. The intervention was introduced to three clusters with four months intervals starting May 2015 through December 2018 at seven Norwegian hospitals. The FLS intervention included medical treatment of osteoporosis for patients 50 years and older with a low-energy fracture. Based on data from the Norwegian Patient Registry, index fractures were assigned respectively to the control group (2011–2015) or intervention group (2015–2018). Rates of a subsequent fragility fracture (distal forearm fracture, proximal humerus fracture or hip fracture), and all-cause mortality were calculated. (Clinicaltrials.gov, NCT02536898).
Results: A total of 100,198 patients (mean age 69.6 years) suffered an index fracture of any type; 8,998 (9%) patients experienced a subsequent fragility fracture and 20,198 (20%) died. During a maximum of 4.7 years follow-up, FLS reduced the risk of any type of subsequent fragility fracture by 12% (hazard ratios (HR) 0.88, 95% confidence intervals (CI) 0.84–0.92) and mortality by 19% (HR 0.81, 95% CI 0.78–0.83). In additional analyses, the risk of a subsequent hip fracture was reduced by 24% (HR 0.76, 95% CI 0.71–0.81).
Conclusion: A standardized FLS intervention can reduce the risk of subsequent fragility fractures and mortality and may thereby contribute to a reduction in the global burden of fragility fractures.
Disclosures: The study was supported with grants from The Regional Health Authorities, Norway. One or more of the authors report support or payment outside the study from UCB, Amgen, Roche Diagnostics, Pharma Prim, Danone, Ortomedic Norway, LINK Norway, Zimmer Biomet Norway, Novo Nordisk, Eli-Lilly, AstraZeneca, Sanofi, Novartis, Takeda, Eli Lily

OC27
PROTON PUMP INHIBITORS ASSOCIATED WITH INCREASED BONE TURNOVER MARKERS: RESULTS OF A LARGE OBSERVATIONAL COHORT STUDY

D. Fitzpatrick[1], R. Lannon[2], E. Laird[3], M. Ward[4], L. Hoey[4], C. F. Hughes[4], J. J. Strain[4], C. Cunningham[4], H. Mc Nulty[4], K. Mc Carroll[1]

[1]Mercer's Institute for Research on Ageing, St James's Hospital, Dublin, Ireland, [2]Mercer's Institute for Research on Ageing, Dublin, Ireland, [3]Department of Nutrition, Atlantic Technological University, Sligo, Ireland, [4]Nutrition Innovation Centre for Food and Health, University of Ulster, Coleraine, United Kingdom

Objective: Extensive research has found an increased risk of osteoporotic fracture with the long-term use of proton pump inhibitors (PPIs). Various factors have been postulated to explain the mechanism by which this occurs [1]. However few studies have examined the relationship between PPIs and bone turnover markers.
Materialsand methods: Participants were from the Trinity-Ulster-Department of Agriculture (TUDA) study, a large cross-sectional cohort of Irish adults aged $\geq$ 60 years. We excluded participants with a known diagnosis of osteoporosis or on treatment for osteoporosis. ANCOVA was used to compare mean levels of bone specific alkaline phosphatase (BAP) and tartrate-resistant acid phosphatase (TRAP 5b) in PPI users versus non-PPI users after controlling for age, sex, body mass index, timed up an go test, 25(OH)D, estimated glomerular filtration rate, parathyroid hormone, smoking, daily dairy intake, alcohol consumption, type 2 diabetes mellitus, current or past steroid exposure, and loop and thiazide diuretics.
Results: A total of 1657 participants met the inclusion criteria, of whom 31.3% (n = 519) were taking PPI medication. PPI users versus non-PPI users were of similar age (70.0 vs 69.7 years $p = 0.267$) though were marginally more likely to be female (54.1 vs. 49.2%, $p = 0.06$). Overall, PPI users versus non-PPI users had higher mean BAP and TRAP5b and this remained significant after multivariate adjustment (BAP 16.7 vs 15.2 μg/L, $p < 0.001$) and TRAP 5b (3.10 vs 2.94 μg/L, $p = 0.002$).
Conclusions: PPIs were associated with increased bone turnover markers. PPIs are known to inhibit calcium absorption by reducing gastric acid secretion which may lead to hyperparathyroidism. However, the increase in bone turnover markers we observed was independent of parathyroid hormone levels suggesting other additional mechanisms which deserves further investigation. These results highlight the importance of appropriate prescribing and deprescribing of PPIs especially in older adults at risk of fracture.

OC28
DISCONTINUATION OF BISPHOSPHONATES IN OLDER PEOPLE WITH COMPLEX HEALTH NEEDS: SELF-CONTROLLED CASE SERIES TO ASSESS FRACTURE RISK

D. Prieto-Alhambra[1], F. Dernie[2], A. Delmestri[1], T. Rathod-Mistry[1], E. H. Tan[1], A. M. Jödicke[1]

[1]NDORMS, University of Oxford, Oxford, United Kingdom, [2]Medical Sciences Division, University of Oxford, Oxford, United Kingdom

Objective: This study aimed to evaluate the effect of discontinuation of treatment with oral bisphosphonates (BP) on the risk of fractures in the post-discontinuation period in older patients.
Methods: We conducted self-controlled case series using UK primary care electronic health data (CPRD GOLD). All patients aged > 65 years and registered in the database for $\geq$ 1 year before study start

(01/01/2010) were included to the source population. Of those, people with a non-elective hospitalisation, or with frailty or polypharmacy in 2009 who didn't use BP in that year were selected. Among those, people with a new BP prescription and a fracture recorded during the study period were included. Exposure was defined as discontinuation of BP, with a treatment gap of > 90 days. Age-adjusted incidence rate ratios (IRR) were calculated to compare fracture rates during BP treatment vs. in the post-discontinuation period. The main analysis included all people irrespective of the duration of continuous BP use, while subgroup analyses required > 1 year of BP treatment prior to discontinuation. To test the robustness of our analyses we tested the assumptions of the SCCS model before progressing with the analyses and repeated our analyses with statins as negative control exposure to assess residual confounding.

Results: We included 171,048 BP-naïve people with complex health needs, of whom 6245 individuals started BP treatment during the study period. We observed 1262 fractures during 9796 person-years of treatment (event rate 128.8/1000 person-years [95% CI 121.7–136.0] and 942 fractures during 6428 person-years of follow-up post-discontinuation (event rate 146.6/1,000 person-years [137.2–156.1]), respectively. IRR of 0.94 [0.81–1.1] in the main analysis indicated no increased fracture risk after discontinuing of BP treatment,

However, for people with > 1 year history of continued BP therapy, our models showed increased fracture risk following treatment discontinuation (IRR of 1.26 [1.0–1.58]).

Negative control exposure analyses showed no association between statins and fracture risk.

Conclusions: Our study showed increased fracture risks when stopping BP in older people with complex health needs after > 1 year of continuous BP therapy. Further research focussing on the risk–benefit of stopping BP is needed.

OC29
GLOBAL BALANCE OF THE SPINE, AN INDEPENDENT CONTRIBUTOR TO PHYSICAL IMPAIRMENTS AND PREDICTOR OF INCIDENT FALLS IN OLDER ADULTS: THE SAFE 3-YEAR LONGITUDINAL COHORT STUDY

M. Hars[1], A. Faundez[2], M.-J. Begin[3], M. Terrien Ferey[1], J. Fechtenbaum[4], K. Briot[4], C. Roux[4], F. Herrmann[5], C. Graf[5], S. Ferrari[6], S. Genevay[7], S. Boudabbous[8], A. Trombetti[1]

[1]Division of Bone Diseases and Division of Geriatrics and Rehabilitation, Geneva University Hospitals and Faculty of Medicine, Geneva, Switzerland, [2]Division of Orthopaedics and Trauma Surgery, Geneva University Hospitals and Faculty of Medicine, and La Tour Hospital, Geneva, Switzerland, [3]Division of Endocrinology, Department of Medicine, Centre Hospitalier de l'Université de Montréal, Québec, Canada, [4]Department of Rheumatology, Cochin Hospital, Assistance Publique-Hôpitaux de Paris, Paris, France, [5]Division of Geriatrics and Rehabilitation, Geneva University Hospitals and Faculty of Medicine, Geneva, Switzerland, [6]Division of Bone Diseases, Geneva University Hospitals and Faculty of Medicine, Geneva, Switzerland, [7]Division of Rheumatology, Geneva University Hospitals and Faculty of Medicine, Geneva, Switzerland, [8]Division of Radiology, Geneva University Hospitals and Faculty of Medicine, Geneva, Switzerland

Objectives: Falls remain the leading cause of fractures in older adults and may result from several intrinsic and extrinsic risk factors. Among them, the role of the global balance of the spine (since recently easily evaluated with the advent of EOS® technology) has never been fully established. In the SAFE cohort, we aimed to determine the association between global balance of the spine, physical function and falls in community-dwelling older adults.

Material and methods: SAFE is an ongoing prospective 3-year longitudinal cohort study conducted in Geneva (Switzerland) among community-dwelling adults aged ≥ 65 years without history of instrumented spinal surgery. All subjects undergo at baseline and 3-year a comprehensive assessment battery including: full skeleton 2D/3D radiographs in the standing position by EOS® low-dose biplane X-ray imaging system, DXA imaging, and physical function tests. Prospective falls and fractures are also collected over the 3-year. Spino-pelvic parameters collected include, among others, the spino-sacral angle (SSA) and the C7-central sacral line (C7-CSL) distance for sagittal and coronal balance, respectively.

Results: Among the 110 subjects (mean age, 75 years; 76% female) included in the final cross-sectional analysis, 40 (36%) reported one or more falls in the past 12 months, 19 (17%) had a Short Physical Performance Battery (SPPB) score ≤ 9 and 8 (7%) were sarcopenic. Global sagittal balance was independently associated with physical performances after controlling for potential confounders (adjusted regression coefficient SPPB/SSA = 0.04, 95% CI [0.01–0.08]; p = 0.024). Global coronal balance was independently associated with both 1-year retrospective falls (OR C7-CSL/faller = 1.59, 95% CI [1.09–2.30]; p = 0.015) and 3-year incident falls (n = 66 first subjects in the longitudinal analysis; OR C7-CSL/faller = 2.25, 95% CI [1.24–4.08]; p = 0.008 and IRR C7-CSL/number of falls = 1.55, 95% CI [1.21–1.98]; p = 0.001), after controlling for potential confounders including age, sex, comorbidities, vertebral fractures and physical performances by SPPB score.

Conclusions: Our results suggest that global sagittal balance of the spine is an independent contributor to physical impairments in older adults, while global coronal balance is an independent predictor of incident falls. Further ongoing longitudinal analysis will fully reveal whether global balance of the spine relates to fractures and the role of compensating mechanisms.

OC30
A NOVEL DRUG COMBINATION WITH THERAPEUTIC POTENTIAL FOR SARCOPENIA

E. Mercken[1], J. Frickel[1], S. Huettner[1], J.-Y. Reginster[2,3], C. Tezze[4,5], M. Sandri[4,5,6], A. Beliën[1]

[1]Rejuvenate Biomed, Diepenbeek, Belgium, [2]WHO Collaborating Center for Epidemiology of Musculoskeletal Health and Aging, Liège, Belgium, [3]Protein Research Chair, Biochemistry Department, College of Science, King Saud University, Riyadh, Saudi Arabia, [4]Department of Biomedical Sciences, University of Padova, Padova, Italy, [5]Veneto Institute of Molecular Medicine, Padova, Italy, [6]Department of Medicine, McGill University, Montreal, Canada

Objectives: To determine the safety and efficacy of RJx-01, a novel drug combination identified using proprietary in-silico discovery (CombinAge™) and *C. elegans* screening/validation (CelegAge™) platforms, in the treatment of sarcopenia, an age-related progressive loss of physical performance and muscle strength that reduces mobility, diminishes quality of life, and increases risk of falls and morbidity.

Methods: RJx-01, consisting of metformin and galantamine, was tested in a Phase 1b randomized, double-blind, placebo-controlled study with 42 healthy males aged 65–75 placed in a full-length cast of the dominant lower extremity for 2 weeks to induce disuse atrophy. During the two weeks of casting and four weeks post-cast removal, 21 participants received RJx-01 and 21 received a placebo. Primary endpoints included safety and tolerability, and pharmacokinetics was assessed as the secondary endpoint. Exploratory endpoints relevant to

sarcopenia, including muscle strength and fatigue using the Biodex Dynamometer and inflammation, were evaluated.
Results: Rejuvenate Biomed recently identified and validated RJx-01 as a potential therapeutic for sarcopenia in worm and mouse pre-clinical models (1). In the Phase 1b trial, RJx-01 was found to be safe and well tolerated among the participants, with no severe or serious adverse events being reported. The RJx-01 proprietary formulation also exhibited high bioavailability. Compared to placebo, RJx-01 treatment significantly enhanced muscle strength and reduced muscle fatigue and inflammation during the recovery phase.
Conclusion: Preclinical studies indicate synergistic beneficial effects of RJx-01 in the treatment of sarcopenia-related phenotypes. The data of the Phase 1b clinical study supports a Phase 2 trial that determines the efficacy of RJx-01 in the treatment of sarcopenia.
Disclosures: EM, JF and SH are employees of Rejuvenate Biomed, and AB is CEO of Rejuvenate Biomed. JR is Chair of Rejuvenate Biomed's Scientific Advisory Committee. All other authors declare that there is no conflict of interest.
References
Tezze C, et al. *JCI Insight* 2023; 8(15):e168787. https://doi.org/10.1172/jci.insight.168787.

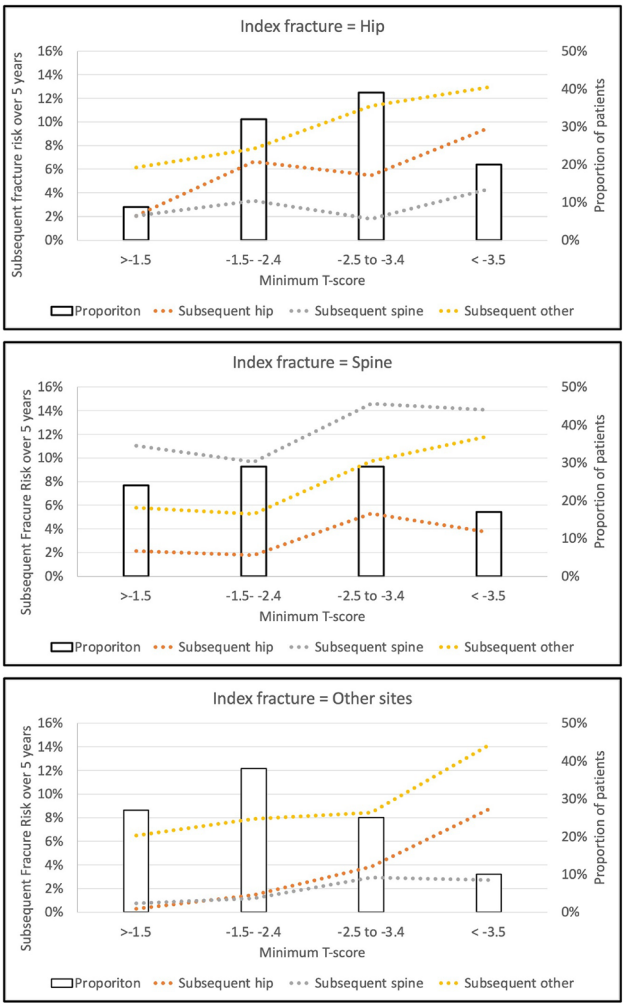
OC31
IMMINENT FRACTURE RISK AND MORTALITY DIFFER BY INDEX FRACTURE SITE AND BONE MINERAL DENSITY

R. Pinedo-Villanueva[1], M. K. Javaid[1], W. D. Leslie[2]

[1]University of Oxford, Oxford, United Kingdom, [2]Department of Medicine, University of Manitoba, Winnipeg, Canada

Objective: Data on imminent fracture risk and mortality after an index fracture are necessary to quantify the expected benefit from a fracture liaison service (FLS). This study describes the association between bone mineral density (BMD) measured after the index fracture and the risk of subsequent fractures and mortality.
Material and methods: The study population comprised women aged 50+ with an index fragility fracture of the hip, clinical spine, or other sites recorded within 2 years of subsequent DXA testing in the Manitoba BMD Program. The 5-year risk of subsequent hip, spine, and other fractures as well as mortality were ascertained.
Results: The study identified 566 women with a sentinel hip (mean age 73.4 yrs), 779 with a vertebral (69.9 yrs), and 3867 with other (66.4 yrs) fractures. The median time from fracture to DXA was under 0.5 yrs. The proportion of women with a lowest T-score ≤ -2.5 was 59%, 46%, and 35% for hip, spine, and other fracture sites, respectively. A significant interaction was observed between the index fracture site and minimum BMD category for subsequent hip fractures ($p = 0.001$) but not spine ($p = 0.09$) or other fracture sites ($p = 0.95$) (Figure). The 5-year mortality was 21.4%, 14%, and 7.9% for hip, spine, and other fractures, respectively. Mortality was significantly higher in those with lowest minimum T-score after spine or other fractures ($p < 0.001$), and uniformly high after hip fracture regardless of T-score ($p = 0.55$). The 5-year fracture risk was generally higher for lower T-scores, ranging from 1.3 times for fractures of spine to spine (11.1% for T-score > -1.5 vs 14.1% for T-score ≤ -3.5) to 30.8 times for other to hip (0.3% for T-score > -1.5 vs 8.7% for T-score ≤ -3.5) (Figure).
Conclusion: The 5-year risk of subsequent fracture and mortality differs by BMD measured after the index fracture and also by index fracture site. These data support a more refined approach to predicting the potential benefits from secondary fracture prevention.

Figure: Relationship between index fracture site, minimum T-score and subsequent fracture risk



OC32
EFFECT OF FRAXPLUS ADJUSTMENTS ON FRACTURE RISK RECLASSIFICATION IN OLDER SWEDISH WOMEN—RESULTS FROM THE SUPERB-STUDY

M. Zoulakis[1], H. Johansson[1], N. C. Harvey[2], K. F. Axelsson[1], H. Litsne[1], L. Johansson[1], E. Liu[3], M. Schini[4], L. Vandenput[5], E. V. McCloskey[6], J. A. Kanis[7], M. Lorentzon[1]

[1]University of Gothenburg, Department of Internal Medicine and Clinical Nutrition, Sahlgrenska Osteoporosis Centre, Gothenburg, Sweden, [2]MRC Lifecourse Epidemiology Centre, University of Southampton,, Southampton, United Kingdom, [3]Mary McKillop Institute for Health Research, Australian Catholic University, Melbourne, Australia, [4]Division of Clinical Medicine, School of Medicine and Population Health, University of Sheffield,, Sheffield, United Kingdom, [5]Mary McKillop Institute for Health Research, Australian Catholic University,, Melbourne, Australia, [6]MRC and Arthritis Research UK Centre for Integrated Research in Musculoskeletal Ageing, Mellanby Centre for Musculoskeletal Research, Sheffield, United Kingdom, [7]Centre for Metabolic Bone Diseases, University of Sheffield, Sheffield, United Kingdom

Objectives: FRAXplus allows adjustment of FRAX fracture probabilities for additional clinical information [currently, recency of osteoporotic fracture, high dose oral glucocorticoids, duration of type

2 diabetes mellitus, lumbar spine (LS) BMD, trabecular bone score (TBS), falls history in previous year, or hip axis length (HAL)]. We examined the impact of FRAXplus adjustments on the proportion of older Swedish women eligible for treatment using a major osteoporotic fracture (MOF) probability intervention threshold (IT) $\geq$ 26% (representing the risk in a 70-year-old Swedish woman with a previous fracture).

Materialsand methods: Ten-year MOF probabilities with femoral neck bone mineral density (BMD, Hologic) were calculated using the original FRAX tool and adjusted, where possible, by FRAXplus using data from the SUPERB cohort of 3028 Swedish women ages 75–80 years. Data on clinical risk factors (CRFs) and outcomes were collected using questionnaires and national registers over a follow-up period of 8 years. Incident MOFs were x-ray verified. The FRAXplus adjustment to MOF and hip fracture probabilities was only applied for one FRAXplus factor, with the most influential being used if more than one adjustment was possible. The net reclassification improvement (NRI) was calculated.

Results: In total, 90% (n = 2723) of the included women had their 10-year MOF probability adjusted, with the most common FRAXplus adjustment factors being HAL (30%), TBS (23%), fall history (20%), LS BMD (8%), and recent fracture (5%; Fig. 1). A similar pattern was observed for hip fracture 10-year probability. Of those below the IT using FRAX alone, 1785 remained below after FRAXplus adjustment, and within this group, 365(20.4%) women had an incident MOF. 339 women had their 10-year MOF probability uplifted above the IT using FRAXplus and in this group, 119 women (35.1%) had an incident MOF. There were 904 women with 10-year MOF probabilities above the IT using both the original FRAX tool and FRAXplus, and within this group, 324(35.8%) women had an incident MOF. The NRI (95% confidence interval) was 4.82% (1.87–7.77%); $p < 0.01$).

Conclusions: Using FRAXplus, a significant proportion of older women had their 10-year fracture probabilities uplifted above the IT, which reflected their elevated fracture risk more accurately.

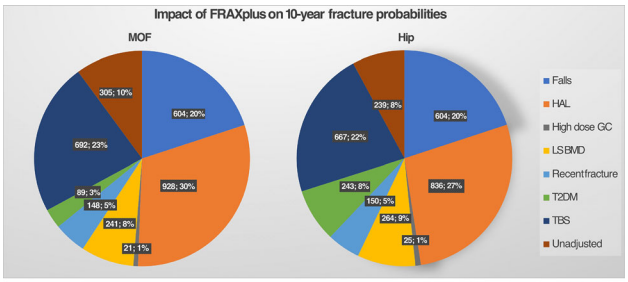


Figure 1. The impact of FRAXplus on 10-year MOF (left) and hip fracture (right) probabilities in older Swedish women in the SUPERB-cohort.

OC33
SMOKING HISTORY AND FRACTURE RISK: A META-ANALYSIS TO UPDATE THE FRAX® RISK ASSESSMENT TOOL

M. Schini[1], H. Johansson[2], N. C. Harvey[3], M. Lorentzon[4], E. Liu[5], L. Vandenput[5], J. A. Kanis[6], E. V. Mccloskey and The Frax Meta-Analysis Cohort Group[7]

[1]Division of Clinical Medicine, School of Medicine and Population Health, Mellanby Centre for Musculoskeletal Research, University of Sheffield, Sheffield, United Kingdom, [2]University of Gothenburg, Gothenburg, Sweden, [3]MRC Lifecourse Epidemiology Centre, NIHR Southampton Biomedical Research Centre, University of Southampton, Southampton, United Kingdom, [4]Sahlgrenska Osteoporosis Centre, Institute of Medicine, University of Gothenburg, Gothenburg, Sweden, [5]Mary McKillop Institute for Health Research, Australian Catholic University, Melbourne, Australia, [6]Centre for Metabolic Bone Diseases, University of Sheffield, Sheffield, United Kingdom, [7]Division of Clinical Medicine, School of Medicine and Population Health, Mellanby Centre for Musculoskeletal Research, University of Sheffield., Sheffield, United Kingdom

Objectives: Smoking has detrimental effects on health and is associated with an increased risk of fractures, thus current smoking is one of the risk factor the FRAX® tool. However, in this meta-analysis of international cohorts, the aim was to examine the relationship of smoking (current and past) with fracture risk, with a view to updating.

Materialsand methods: The risk of fracture associated with current smoking was estimated by an extended Poisson model applied separately to each of 57 prospective cohort studies. Covariates included time since start of follow up, current age, and in an additional model, BMD at the femoral neck. The results of the different studies were merged by using the inverse-variance weighted β-coefficients.

Results: The analysis included a total of 1 634 449 participants (60% female, mean age 60 years). Current smoking, documented in 12% of participants (15.3% men and 9.8% women), was associated with a significantly increased risk of any fracture in both men and women (Table). Current smoking was associated with a greater increase in fracture risk in men than in women. The hazard ratio (HR) was somewhat attenuated with the inclusion of BMD but remained statistically significant in all categories, suggesting that the risk is largely independent from BMD. When compared to non-smokers, there was little evidence for increased fracture risk amongst women who were past smokers for most fracture categories. In men, past smoking was significantly associated with fracture risk [1.11 (1.03, 1.18)]; however, the magnitude of the effect was lower than what was observed for current smokers [1.43 (95% CI 1.26, 1.62)].

Conclusions: Our results confirm an association between current smoking and increased fracture risk that is largely independent of BMD. The attenuation of the smoking associated fracture risk in past vs current smokers supports the skeletal benefits of smoking cessation. These data will be used to inform future iterations of FRAX.

***Table**: Hazard ratio (HR) and 95% confidence intervals (CI) for fractures in current smokers in men and women.*
Abbreviations: BMD= bone mineral density; HR= hazard ratio; CI= confidence intervals; MOF= major osteoporotic fracture; OST= osteoporotic fracture

	Adjusted for age and time since baseline		Adjusted for age and time since baseline – for those with BMD		Adjusted for age, time since baseline and BMD	
	Cohorts (N)	HR (95% CI)	Cohorts (N)	HR (95% CI)	Cohorts (N)	HR (95% CI)
Female						
Hip	39	1.60 (1.48-1.74)	33	1.60 (1.46, 1.76)	33	1.48 (1.34, 1.64)
MOF	46	1.21 (1.15-1.27)	39	1.22 (1.16, 1.29)	39	1.16 (1.10, 1.22)
Male						
Hip	24	1.75 (1.55, 1.97)	19	1.83 (1.59, 2.10)	18	1.57 (1.30, 1.89)
MOF	30	1.37 (1.26, 1.50)	27	1.37 (1.24-1.51)	27	1.19 (1.08, 1.31)

OC34
QUANTITATIVE MOTION ARTEFACT GRADING IN HR-PQCT CLINICAL IMAGING: AN ALGORITHMIC APPROACH

T. Cox[1], S. Mahmoodi[1], L. D. Westbury[2], N. R. Fuggle[2], S. Lu[1], N. C. Harvey[2]

[1]Faculty of Engineering and Physical Sciences, Electronics and Computer Science, University of Southampton, Southampton, United Kingdom, [2]MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom

Objective: High-Resolution peripheral Quantitative Computed Tomography (HR-pQCT) is a three-dimensional imaging technique which captures detailed information on bone microarchitecture. Unfortunately, this increased resolution comes at the cost of increased sensitivity to motion artefact, assessment of which typically requires manual review. We therefore aimed to develop an algorithmic approach to automatically identify and quantify motion artefact.

Methods: Our approach was to detect motion artefact in a HR-pQCT scan by examining and exploiting the sinogram produced from the raw projection data. Unlike processed CT scans, sinogram data retain a temporal component, making it easy to detect shifts where, or more accurately when, subject motion has occurred during a scan. To detect these subtle shifts, we implemented a machine learning approach using the state-of-the-art U-Net neural network architecture to segment the areas of interest in the sinogram. Subsequently, we developed an algorithm to detect the number and severity of shifts that occurred across the scan and used this to calculate a quantitative measure of motion artefact.
Results: We tested our algorithm against manual gradings on 739 scans of children ages 6–10 years, in which the prevalence of motion artefact was high. Our preliminary results demonstrated that our approach more accurately assigned a high score to scans with high levels of motion artefact than existing methods. Specifically, our method captured each instance of subject motion across the entire scan, whereas previous work done by Sode et al. only captured net motion. However, our results were not perfect, and we aim to improve our algorithm to better capture all severities of artefact.
Conclusion: Our results show a better performance in accurately detecting motion artefact than existing methods and can be implemented to automatically check for motion artefact immediately when a HR-pQCT scan is taken. Additionally, our quantitative approach can be used to detect where artefact has occurred in a scan, which could be used to correct it.
References:
Sode, M., Burghardt, A. J., Pialat, J.-B., Link, T. M., and Majumdar, S. (2011). Quantitative characterization of subject motion in hr-pqct images of the distal radius and tibia. Bone, 48(6):1291–1297.

OC35
FRACTURE RATE AND LOCATION IN ADULTS WITH HYPOPHOSPHATASIA WITH ONE VERSUS MULTIPLE ALPL VARIANTS: DATA FROM THE GLOBAL HPP REGISTRY

L. Seefried[1], K. Dahir[2], G. Martos-Moreno[3], K. Ozono[4], W. Högler[5], C. Rockman-Greenberg[6], S. Fang[7], A. Petryk[7], P. Kishnani[8], A. Linglart[9]

[1]University of Würzburg, Würzburg, Germany, [2]Vanderbilt University Medical Center, Nashville, United States, [3]Hospital Infantil Universitario Niño Jesús, IIS La Princesa, Universidad Autónoma de Madrid, CIBERobn, ISCIII, Madrid, Spain, [4]Osaka University, Suita, Osaka, Japan, [5]Johannes Kepler University Linz, Linz, Austria, [6]University of Manitoba, Winnipeg, Manitoba, Canada, [7]Alexion, AstraZeneca Rare Disease, Boston, United States, [8]Duke University Medical Center, Durham, United States, [9]Paris-Saclay University, AP-HP and INSERM, Paris, France

Objective: Hypophosphatasia (HPP), a rare, inherited disease associated with compromised bone mineralization, is caused by variants in the *ALPL* gene encoding tissue-nonspecific alkaline phosphatase (ALP). Fracture rates, locations, and the clinical implications of having 1 vs $\geq$ 2 *ALPL* variants are incompletely characterized in patients with HPP.
Methods: Adults in the Global HPP Registry (NCT02306720) with low ALP, $\geq$ 1 *ALPL* variant, and fracture data were included in the analysis. Fracture rate and distribution of fractures by location were determined for patients aged $\geq$ 18 to $<$ 50 (younger adults) and $\geq$ 50 years (older adults). Fractures and pseudofractures were combined for analysis; results were stratified by number of *ALPL* variants.
Results: The study population included 278 younger adults (75.2% females) and 249 older adults (72.3% females), with a history of fractures in 38.1% (younger adults) and 57.0% (older adults). Age-adjusted fracture rate per 100 person-years was 2.49 (95% CI 2.19, 2.82) in younger adults and 2.78 (95% CI 2.52, 3.06) in older adults. Metatarsal fractures were the most common fractures in younger adults (14.4% of patients and 25.6% of fractures) and older adults (19.3% and 17.5%), with similar rates in patients with 1 or $\geq$ 2 *ALPL* variants. Femoral fractures were more prevalent in those with $\geq$ 2 vs 1 *ALPL* variant (younger adults: 17.6% vs 1.2%; older adults: 46.9% vs 8.3%). Vertebral fractures were reported in 2.9% of younger adults and 9.2% of older adults.
Conclusions: Patients with HPP have relatively high rates of metatarsal fractures, and of femoral fractures in those with $\geq$ 2 *ALPL* variants. The vertebral fracture rate was lower in patients with HPP than in those with osteoporosis. These data suggest that fractures in patients with HPP have a distinct pattern compared with the general population or patients with osteoporosis.
Funding: Study sponsored by Alexion, AstraZeneca Rare Disease, Boston, MA. Writing and editorial assistance provided by Peloton Advantage, LLC, an OPEN Health company, funded by Alexion, AstraZeneca Rare Disease.
Disclosures: LS, KMD, GÁMM, KO, WH, CRG, PSK, and AL have consulted for and/or received research funding/honoraria from Alexion, AstraZeneca Rare Disease. SF and AP are employees of and may own stock/options in Alexion, AstraZeneca Rare Disease.

OC36
IS THERE AN ASSOCIATION BETWEEN BIRTH WEIGHT OR GESTATIONAL AGE AND FRACTURE RISK IN YOUNG ADULTS?

H. T. Holltrø[1], T. I. L. Nilsen[1], B. Schei[2], I. Tronstad[2], A. Langhammer[3], M. Hoff[4]

[1]INB, NTNU, Norwegian University of Science and Technology, Trondheim, Norway, [2]ISM, NTNU, Norwegian University of Science and Technology, Trondheim, Norway, [3]HUNT, ISM, NTNU, Norwegian University of Science and Technology, Trondheim, Norway, [4]INB, NTNU, Norwegian University of Science and Technology/ St Olavs Hospital, University hospital in Trondheim, Trondheim, Norway

Objective: To examine the association between birth characteristics and fracture risk in a Norwegian cohort born 1967–1988.
Methods: Data on 6434 women and 4665 men who participated in the 3rd survey the HUNT Study, (HUNT3, 2006–08), were linked to the Medical Birth Registry of Norway and patient records at the regional hospitals. ICD9 and ICD10 was used to identify fractures of the wrist, humerus, hip, or spine from 01.01.1988 to 21.10.2021. Participants were followed from 01.01.1988 until the first fracture; date of death or end of follow-up. Cox regression was used for estimating hazard ratios (HR) between birth weight, gestational age, and fracture (95% CI) adjusted for birth year, sex, maternal age, and maternal morbidity.
Results: 539 fractures were observed (women 289 (4.5%), men 251 (5.4%)) during a median follow-up time of 33.8 years. Forearm fractures accounted for 61%. Mean age at fracture was 32.1 years (range 2.4–53.5). 389 (3.5%) had a birth weight $<$ 2.5 kg and 1362 (12.3%) were born small for gestational age (SGA). The adjusted HR for fracture among those with a birth weight $<$ 2.5 kg was 0.97 (0.55–1.71) compared to those born with a birth weight 3.5–3.9 kg and 1.01 (0.78–1.31) for SGA compared to those born appropriate for gestational age. In analyses excluding those with birthweight $<$ 2.5 kg, the HRs pr 100 g and one SD increase were 0.99 (0.97–1.00) and 0.93 (0.85–1.02), respectively.
Conclusion: In this study, we found no association between birth weight or gestational age and subsequent fracture risk in young adults.

Table 1. Incidence rate and hazard ratios (HR) of fracture according to birth characteristics

Variable	Number (%)	Person-year	Fractures (n)	HR, crude	HR Adjusted** (95% CI)	Trend-test
Birthweight, kg						
Continuous (per 100 g increase)	11,099 (100)	367284	539	1.00	0.99 (0.97-1.01)	1.00 (0.98-1.01)
Continuous (per SD) *	11,099 (100)	367284	539	0.99	0.94 (0.86-1.03)	0.98 (0.90-1.07)
<2.5	389 (3.50)	12869	15	0.82	0.97 (0.55-1.71)	
2.5-2.9	842 (7.59)	27953	44	1.10	1.16 (0.83-1.61)	
3.0-3.4	3,157 (28.44)	104347	162	1.09	1.11 (0.90-1.36)	
3.5-3.9	4,227 (38.08)	139953	200	1 (ref)	1 (ref)	
4.0-4.4	1,968 (17.73)	65093	93	1.00	0.98 (0.77-1.26)	
≥ 4.5	516 (4.65)	17069	25	1.03	1.00 (0.65-1.51)	0.99 (0.92-1.07)
Gestational age						
Small for gestational age (SGA)	1,362 (12.27)	45071	67	1.00	1.01 (0.78-1.31)	
Appropriate for gestational age (AGA)	8,719 (78.56)	288461	428	1 (ref)	1 (ref)	0.95 (0.83-1.09)
Large for gestational age (LGA)	1,018 (9.17)	33752	44	0.88	0.88 (0.64-1.20)	

* SD = 472 g in week 40 of gestation

** Models are adjusted for birth year, sex, maternal age, and maternal morbidity

OC37
AIR POLLUTION AND BONE HEALTH OUTCOMES: PERIODS OF SUSCEPTIBILITY FROM PREGNANCY TO CHILDHOOD

L. Scheepers[1], A. C. Binter[2], S. Santos[3], S. Petricola[4], F. Rivadeneira[5], V. Jaddoe[5], M. Guxens[6], F. Johnston[1]

[1]University of Tasmania, Hobart, Australia, [2]ISGlobal, Universitat Pompeu Fabra, Spanish Consortium for Research on Epidemiology and Public Health (CIBERESP), Barcelona, Spain, [3]Universidade Porto & Erasmus Medical University, Porto, Netherlands, [4]ISGlobal, Universitat Pompeu Fabra, & Spanish Consortium for Research on Epidemiology and Public Health (CIBERESP), Barcelona, Spain, [5]Erasmus University Medical Centre, Rotterdam, Netherlands, [6]ISGlobal, Universitat Pompeu Fabra, Spanish Consortium for Research on Epidemiology and Public Health, Erasmus University Medical Centre, Barcelona, Spain

Objective: Exposure to environmental factors during early life may provoke physical responses that have a lasting impact on skeletal development. We aimed to identify periods of susceptibility to air pollution in early life in relation to bone health outcomes at age six.
Material and methods: Data were from the Generation R study, a population-based pregnancy cohort study in Rotterdam, The Netherlands. In total, 9901 women with a delivery date from April 2002 until January 2006 were enrolled in the study. We estimated daily concentrations of nitrogen dioxide (NO2) and particulate matter (PM10, PM2.5 and PM2.5 absorbance) at the home addresses during pregnancy and childhood, using land-use regression models. Bone mineral density (BMD) and area-adjusted bone mineral content (aBMC) were measured by dual-energy x-ray absorptiometry (DXA) at age six. We performed distributed lag non-linear modelling (DNLM) adjusted for several socioeconomic characteristics to assess the associations between air pollution and bone health and identify windows of susceptibility.
Results: Among 5910 children, we identified windows of susceptibility from approximately 1 year to 4 years of age for PM2.5 and PM2.5 absorbance with BMD (e.g., – 10.3; CI– 15.8 to – 4.7 per 5 $\mu g/m^3$ increase in PM2.5) and for all air pollutants with aBMC (e.g., – 14.6; CI – 20.7 to – 8.4 per 5 $\mu g/m^3$ increase in PM2.5). Also, we identified a positive association between NO2 and PM2.5 absorbance during pregnancy with aBMC (e.g., 4.0; CI 1.4 to 6.6 per 10^{-5} m^{-1} increase in PM2.5 absorbance). Associations followed similar trends, but remained only statistically significant in boys, and not in girls.
Conclusion: Exposure to air pollution during childhood may have adverse impacts on bone health outcomes at age six, and between ∼ 1 to ∼ 4 years may be a critical period of higher susceptibility.

Funding: Erasmus MC, ZonMw, Ministry of Health, Welfare and Sport, European Union's Horizon, and Generalitat de Catalunya (CERCA Program).

Associations between exposure to air pollutants at pregnancy and childhood with measures of bone health at ~6 years of age (n = 5,910).

	Bone mineral density (BMD)		Area-adjusted bone mineral content (aBMC)	
Air pollutants	Lags	Estimate	Lags	Estimate
NO2 (Δ 10 $\mu g/m^3$)	--	--	Conception - 28 weeks of gestation	1.2 (95% CI 0.3 to 2.2)
	--	--	1.3 year - 3.9 years	-3.8 (95% CI -6.1 to -1.5)
PM10 (Δ 10 $\mu g/m^3$)	--	--	1.6 year - 3.9 years	-6.5 (95% CI -10.8 to -2.2)
PM2.5 (Δ 5 $\mu g/m^3$)	1.1 year - 4.1 years	-10.3 (95% CI -15.8 to -4.7)	9 months - 4.2 years	-14.6 (95% CI -20.7 to -8.4)
PM2.5 absorbance (Δ 10^{-5} m^{-1})	--	--	Conception - 1 months	4.0 (95% CI 1.4 to 6.6)
	1.3 year - 3.8 years	-7.8 (95% CI -13.1 to -2.5)	1.0 year - 3.9 years	-13.4 (95% CI -19.4 to -7.4)
	--	--	4.8 years - 5.5 years	5.4 (95% CI 1.8 to 9.0)

Estimates and 95% CI from distributed lag non-linear model, adjusted for maternal and paternal age, maternal and paternal educational levels, marital status, monthly household income, maternal smoking during pregnancy, child's sex and ethnicity, child's age, height, and bone free mass at the DXA scan visit, and year and month of conception. Associations after correction for multiple testing (P-value < 0.025). Abbreviations: CI, confidence interval; NO2, nitrogen dioxide; PM2.5, particulate matter with aerodynamic diameter <2.5μm; PM10, particulate matter with aerodynamic diameter <10μm; PM2.5 absorbance, absorbance of PM2.5 filters.

OC38
FAMILY HISTORY OF FRACTURE AND FRACTURE RISK: A META-ANALYSIS TO UPDATE THE FRAX® RISK ASSESSMENT TOOL

E. V. McCloskey[1], H. Johansson[2], E. Liu[3], M. Schini[4], L. Vandenput[3], N. C. Harvey[5], M. Lorentzon[6], W. D. Leslie[7], J. A. Kanis and The Frax Meta-Analysis Cohort Group[8]

[1]Division of Clinical Medicine, School of Medicine and Population Health, Mellanby Centre for Musculoskeletal Research, University of Sheffield., Sheffield, United Kingdom, [2]University of Gothenburg, Gothenburg, Sweden, [3]Mary McKillop Institute for Health Research, Australian Catholic University, Melbourne, Australia, [4]Division of Clinical Medicine, School of Medicine and Population Health, Mellanby Centre for Musculoskeletal Research, University of Sheffield, Sheffield, United Kingdom, [5]MRC Lifecourse Epidemiology Centre, NIHR Southampton Biomedical Research Centre, University of Southampton, Southampton, United Kingdom, [6]Sahlgrenska Osteoporosis Centre, Institute of Medicine, University of Gothenburg, Gothenburg, Sweden, [7]Department of Medicine, University of Manitoba, Winnipeg, Canada, [8]Centre for Metabolic Bone Diseases, University of Sheffield, Sheffield, United Kingdom

Objectives: To undertake a meta-analysis of international prospective cohorts to quantify the relationship between a family history of fracture and future fracture incidence, when adjusted for age, sex, time since baseline and femoral neck bone mineral density (BMD).
Materialsand methods: We investigated the relationship between family hip fracture or any fracture history and the risk of any clinical fracture, any osteoporotic fracture, major osteoporotic fracture (MOF) and hip fracture alone using an extended Poisson model in each cohort. Models were adjusted for current age, sex, BMD, and follow up time. The results of the different studies were merged using inverse weighted β-coefficients. We evaluated if the association between family fracture history differed age, follow-up time, and parental fracture origin (maternal vs. paternal) using traditional interaction terms.
Results: The interim analysis dataset comprised up to 281,893 men and women from up to 40 cohorts in 28 countries followed for a total of 2.42 million person-years. After adjustment for age and time since baseline, parental hip fracture was associated with higher risk of incident fracture across all fracture outcome categories in both men and women. The association was strongest for incident hip fractures alone [Hazard Ratio (95% CI): 1.40 (1.26–1.56) and 1.37 (1.05–1.80) in women and men respectively], and the increased fracture risk was similar by sex across all incident fracture categories. Associations were largely unchanged when additionally adjusted for BMD, did not vary by age or follow-up time, and were similar if the history of hip fracture was maternal or paternal. In a limited analysis of sibling history of hip fracture or any fracture, both demonstrated similar associations to those observed with parental history.

Conclusions: In this large international cohort meta-analysis, a family history of fracture is confirmed as a significant independent predictor of future fracture risk. While parental hip fracture appears the strongest factor for future hip fracture, the findings also suggest that a family history of other fractures might be appropriate for inclusion in future iterations of the FRAX tool.

OC39
SEX DEPENDENT ASSOCIATIONS BETWEEN BMI AND FRACTURE RISK: AN INTERNATIONAL META-ANALYSIS

N. C. Harvey[1], H. Johansson[2], E. V. McCloskey[3], E. Liu[4], M. Schini[5], L. Vandenput[6], M. Lorentzon[7], W. D. Leslie[8], J. A. Kanis[2], -. Frax Meta-Analysis Cohort Group[2]

[1]MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom, [2]Centre for Metabolic Bone Diseases, University of Sheffield, Sheffield, United Kingdom, [3]MRC Versus Arthritis Centre for Integrated research in Musculoskeletal Ageing, Mellanby Centre for Musculoskeletal Research, University of Sheffield, Sheffield, United Kingdom, [4]Mary McKillop Institute for Health Research, Australian Catholic University, Melbourne, Australia, [5]Division of Clinical Medicine, School of Medicine and Population Health, University of Sheffield, Sheffield, United Kingdom, [6]Sahlgrenska Osteoporosis Centre, Department of Internal Medicine and Clinical Nutrition, Institute of Medicine, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden, [7]Sahlgrenska Osteoporosis Centre, Institute of Medicine, University of Gothenburg, Gothenburg, Sweden, [8]Department of Medicine, University of Manitoba, Winnipeg, Canada

Objectives: In this international meta-analysis, we aimed to quantify the predictive value of body mass index (BMI) for incident fracture in men and women, and to investigate the relationship of this risk with femoral neck bone mineral density (BMD).

Materialsand methods: The interim analysis dataset comprised individual records of 172,059 men and women with BMD measured, from 51 cohorts in 20 countries. The total follow-up time was 1.4 million person-years. We investigated associations between WHO-defined BMI categories (Underweight: < 18.5 kg/m^2; Normal: 18.5–24.9 kg/m^2; Overweight: 25.0–29.9 kg/m^2; Obese I: 30.0–34.9 kg/m^2; Obese II: ≥ 35.0 kg/m^2) and risk of major osteoporotic fracture (MOF) or hip fracture (HF) alone using an extended Poisson model in each cohort. The covariates examined were age, sex, BMD, and duration of follow-up. The results of the different studies were merged by using the inverse-variance weighted β-coefficients.

Results: After adjustment for age and time since baseline, lower BMI was associated with a greater risk of incident fracture in both men and women. Thus, for underweight individuals compared with normal weight, the hazard ratio [95% CI] for HF was 2.30 [2.03–2.60] in women with an even more marked association in underweight men (HR 3.51 [2.05–5.99]) (Table). In both sexes, HF risk was lower in overweight and obese categories compared to normal weight. The pattern was similar for MOF but with a lower magnitude of effect for the increased risk in the underweight category.

Adjustment for femoral neck BMD T-score attenuated the increased risk associated with underweight and led to attenuation or inversion of the association in overweight and obese categories. Thus, after BMD adjustment, higher BMI category was progressively associated with greater hip fracture risk, with the association stronger in men than women. The pattern was similar for MOF.

Conclusions: In the largest ever meta-analysis undertaken to date, underweight was a consistent risk factor for HF and MOF. In contrast, overweight and obesity appeared protective for these fracture outcomes in models adjusted for age and follow-up time, but became risk factors after additional adjustment for femoral neck BMD, particularly in the highest BMI category. Notably, the effect of BMI extremes seemed greater in men than women. These findings will inform the next iteration of FRAX®.

Table. Hazard ratio for hip and major osteoporotic fracture [+ 95% confidence intervals] according to WHO-defined BMI category (adjusted for age and follow-up time).

	Category of weight status				
	Underweight	Normal	Overweight	Obese I	Obese II
Without BMD adjustment					
Women, Hip	2.30 [2.03-2.60]	1 (REF)	0.74 [0.71-0.78]	0.64 [0.57-0.70]	0.71 [0.58-0.88]
Men, Hip	3.51 [2.05-5.99]	1 (REF)	0.70 [0.66-0.75]	0.65 [0.54-0.79]	0.95 [0.94-0.97]
Women, MOF	1.37 [1.26-1.49]	1 (REF)	0.90 [0.85-0.96]	0.82 [0.75-0.90]	0.78 [0.69-0.89]
Men, MOF	1.95 [1.65-2.30]	1 (REF)	0.86 [0.82-0.91]	0.83 [0.76-0.91]	0.96 [0.96-0.97]
Adjusted for BMD					
Women, Hip	1.72 [1.44-2.06]	1 (REF)	1.00 [0.92-1.08]	0.99 [0.88-1.11]	1.32 [1.02-1.71]
Men, Hip	1.90 [1.05-3.45]	1 (REF)	1.11 [0.99-1.26]	1.18 [0.93-1.48]	2.07 [1.36-3.14]
Women, MOF	1.12 [1.01-1.23]	1 (REF)	1.08 [1.01-1.15]	1.12 [1.03-1.23]	1.22 [1.08-1.38]
Men, MOF	1.37 [1.05-1.79]	1 (REF)	1.08 [1.00-1.18]	1.18 [1.04-1.34]	1.76 [1.45-2.15]

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): Oral Presentations Abstracts

OP1-P683
EFFICACY AND SAFETY OF CT-P41, A PROPOSED DENOSUMAB BIOSIMILAR, COMPARED TO REFERENCE DENOSUMAB (PROLIA) IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS

J.-Y. Reginster[1], E. Czerwinski[2], A. Strzelecka[3], K. Szymanowski[4], S. Postol[5], A. Poder[6], J. Supronik[7], K. Wilk[2], P. Borowy[2], T. Budlewski[8], M. Janowska-Maus[3], J. Kwiatek[4], S. H. Kim[9], J. H. Suh[9], N. R. Han[9], N. H. Kim[9], S. H. Bae[9], S. L. Silverman[10]

[1]Chair for Biomarkers of Chronic Diseases, College of Science, King Saud Univ., Riyadh, Saudi Arabia, [2]Krakowskie Centrum Medyczne, Kraków, Poland, [3]SOMED CR Sp. z o.o. Sp. Komandytowa-Lodz, Lódz, Poland, [4]Centrum Medyczne Poznan-PRATIA, Skórzewo, Poland, [5]Medical Center of Medbud-Clinic LLC, Kyiv, Ukraine, [6]Clinical Research Centre Ltd, Tartu, Estonia, [7]Osteo Medic SC Artur Racewicz Jerzy Supronik, Bialystok, Poland, [8]Dept. of Rheumatology, Medical Univ. of Lodz, Lodz, Poland, [9]Celltrion, Inc., Incheon, South Korea, [10]OMC Clinical Research Center and Cedars Sinai Medical Center, Beverly Hills, USA

Objective: To demonstrate similar efficacy, safety, and immunogenicity of CT-P41 and Prolia in postmenopausal women with osteoporosis (PMO).
Methods: This was a double-blind, active-controlled, Phase 3 study (NCT04757376) in PMO with lumbar spine BMD (LS-BMD) T-score of ≤ -2.5 to ≥ -4.0. A total of 479 patients were randomized (1:1) to receive 60 mg of CT-P41 or Prolia every 6 months. The primary efficacy endpoint was the percent change from baseline (%CFB) in LS-BMD at Week 52. The secondary efficacy endpoints were the %CFB in LS-BMD and in BMD at total hip (TH) and femoral neck (FN) and fracture incidence. Safety and immunogenicity were monitored during the study. Here, the results up to Week 52 in the CT-P41 and Prolia groups are presented.
Results: The therapeutic equivalence was demonstrated between the CT-P41 and Prolia groups in the mean %CFB in LS-BMD at Week 52 with 95% CIs for the treatment difference which was entirely within the predefined equivalence margins ($\pm$ 1.503%) (Table 1). The mean %CFB in BMD for LS, TH, and FN increased after each dosing and were comparable between groups. A new vertebral fracture was reported for 1 patient each at Week 26 in both groups. There was no hip fracture reported and the incidence of nonvertebral fracture was similar between groups (CT-P41: 0.8%; Prolia: 1.7%). The incidence of adverse events (AEs) (CT-P41: 75.7%; Prolia: 70.2%) and serious AEs (CT-P41: 2.9%; Prolia: 4.2%) were similar between groups. Most AEs were Grade 1 or 2 and were not related to study drugs. Most patients had at least one anti-drug antibody (ADA) positive result due to the sensitive assay but most of the ADA titer values were low. There was no patient with a positive neutralizing antibody result.

Table 1. Percent Change from Baseline in BMD for Lumbar Spine by DXA at Week 52 (ANCOVA)

Analysis Set Group	n / N	LS Mean (SE)	LS Mean Difference	95% CI of LS Mean Difference	Mean difference and 95% CI (CT-P41 – Prolia)
Full Analysis Set					
CT-P41	222 / 239[1]	4.9317 (0.31508)	-0.139	(-0.826, 0.548)	-0.826, 0.548
Prolia	212 / 238[1]	5.0706 (0.32714)			
Per-protocol Set					-0.973, 0.414
CT-P41	215 / 215[2]	5.0330 (0.31640)	-0.280	(-0.973, 0.414)	
Prolia	202 / 202[2]	5.3125 (0.33505)			-1.503% 0 +1.503%

Abbreviation: ANCOVA, analysis of covariate; BMD, bone mineral density; CI, confidence interval; DXA, dual-energy X-ray absorptiometry; LS, least square; SE, standard error.
1. The number of patients who had a BMD assessment result for lumbar spine by DXA at Week 52 / The number of patients in full analysis set.
2. The number of patients who had a BMD assessment result for lumbar spine by DXA at Week 52 / The number of patients in per-protocol set.

Conclusion: The therapeutic equivalence of efficacy was demonstrated between the CT-P41 and Prolia in PMO. The secondary efficacy, safety, and immunogenicity results supported the similarity of CT-P41 and Prolia. CT-P41 was well tolerated with a safety profile comparable to that of Prolia.
Disclosures: JYR: Consulting fees from Celltrion, Inc.; EC, AS, KS, SP, AP, JS, KW, TB, MJM, and JK: grants from Celltrion, Inc.; PB: grants from Cellrion, Inc. and consulting fees from Amgen and Astra Zeneca; SHK, JHS, NRH, NHK, and SHB: employees of Celltrion, Inc.; SLS: grants from Amgen and consulting fees from Amgen, Radius, and Celltrion Inc.

OP2-P1394
BISPHOSPHONATES SHOW NO ASSOCIATION WITH PREVENTING, SLOWING, OR DELAYING RADIOGRAPHIC CHANGES AND PAIN IN HIP OSTEOARTHRITIS: A FOUR-YEAR STUDY IN FEMALE ADULTS USING DATA FROM THE OSTEOARTHRITIS INITIATIVE STUDY

Z. Salis[1]

[1]Univ. of Geneva, Geneva, Switzerland

Objective: To investigate the potential impact of bisphosphonates on radiographic changes and pain in individuals with no or early stages of hip osteoarthritis (OA).
Methods: This study examined data from the Osteoarthritis Initiative (OAI), which included 4088 hips from 2,057 participants, predominantly with no or early stages of radiographic hip OA at baseline. Bisphosphonate users were identified as those who reported usage at least three times, including at baseline and during the subsequent 1-y, 2-y, 3-y, and 4-y follow-up visits. Non-users were participants who did not use bisphosphonates in the 5 y preceding the baseline and at subsequent follow-up visits. Generalized estimating equations were performed to assess the association between bisphosphonate use and outcomes relating to radiographic changes and pain in hip OA over a 4-y follow-up.
Results: The analysis revealed no statistically significant difference between bisphosphonate users and non-users concerning radiographic changes and pain in hip OA over 4 ys. Specifically, the odds ratios for the incidence and progression of radiographic hip OA were 0.58 (95% CI 0.27 to 1.22) and 0.80 (95% CI 0.49 to 1.32), respectively (Table 1). Furthermore, the odds ratios for the development and resolution of frequent hip pain were 1.04 (95% CI 0.76 to 1.42) and 0.99 (95% CI 0.72 to 1.36), respectively (Table 2).

Table 1. Association of bisphosphonate use and incidence and progression of radiographic hip OA, and worsening individual radiographic features of the hip OA, during 4-y follow-up in radiographic hip OA cohort, as shown in univariate and multivariable analyses.

Outcomes	Users*	Non-users^
Hips	N=666	N=2,599
(Participants)	n=337	n=1,314
Incidence of radiographic hip OA		
Events (%)	10 (1.50)	45 (1.73)
Univariate analysis		
Odds ratio (95%CI)	0.87 (0.42 to 1.78))	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.58 (0.27 to 1.22)	1 (reference)
Progression of radiographic hip OA		
Events (%)	25 (3.75)	91 (3.50)
Univariate analysis		
Odds ratio (95%CI)	1.07 (0.67 to 1.73)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.80 (0.49 to 1.32)	1 (reference)
Worsening individual radiographic features of hip OA		
Joint space narrowing lateral		
Events (%)	10 (1.50)	40 (1.54)
Univariate analysis		
Odds ratio (95%CI)	0.98 (0.46 to 2.06)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.79 (0.36 to 1.75)	1 (reference)
Joint space narrowing medial		
Events (%)	33 (4.95)	95 (3.66)
Univariate analysis		
Odds ratio (95%CI)	1.37 (0.87 to 2.15)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.95 (0.59 to 1.53)	1 (reference)
Osteophytes acetabular superior		
Events (%)	12 (1.80)	47 (1.81)
Univariate analysis		
Odds ratio (95%CI)	1.00 (0.49 to 2.03)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.82 (0.38 to 1.74)	1 (reference)
Osteophytes acetabular inferior		
Events (%)	5 (0.75)	16 (0.62)
Univariate analysis		
Odds ratio (95%CI)	1.22 (0.43 to 3.50)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	1.07 (0.35 to 3.30)	1 (reference)
Osteophytes femoral superior		
Events (%)	16 (2.40)	67 (2.58)
Univariate analysis		
Odds ratio (95%CI)	0.93 (0.51 to 1.67)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.71 (0.38 to 1.32)	1 (reference)
Osteophytes femoral inferior		
Events (%)	8 (1.20)	15 (0.58)
Univariate analysis		
Odds ratio (95%CI)	2.07 (0.82 to 5.22)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	1.13 (0.43 to 2.97)	1 (reference)
By the sum of osteophyte scores		
Events (%)	11 (1.65)	29 (1.12)
Univariate analysis		
Odds ratio (95%CI)	1.46 (0.67 to 3.19)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	1.05 (0.46 to 2.39)	1 (reference)

* Defined as bisphosphonate use at least three examinations, including baseline and follow-up visits (1-year, 2-year, 3-year, and 4-year). ^Non-users were identified as those who did not use bisphosphonates in the preceding 5 years and at any of the examined time points. Multivariable analysis was adjusted for the baseline values of age and BMI. CI: Confidence Interval; OA: Osteoarthritis.

Table 2. Association of bisphosphonate use and development and resolution of frequent and any pain in the hip during 4-year follow-up in frequent hip pain cohort and any hip pain cohort, respectively, as shown in univariate and multivariable analyses.

Outcomes	Users*	Non-users^
Frequent hip pain cohort		
Hips	N=680	N=2,782
(Participants)	n=356	n=1,461
Development of frequent pain in the hip		
Events (%)	88 (12.94)	353 (12.69)
Univariate analysis		
Odds ratio (95%CI)	1.02 (0.76 to 1.36))	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	1.04 (0.76 to 1.42)	1 (reference)
Resolution of frequent pain in the hip		
Events (%)	86 (12.65)	355 (12.76)
Univariate analysis		
Odds ratio (95%CI)	0.98 (0.73 to 1.32)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.99 (0.72 to 1.36)	1 (reference)
Any hip pain cohort		
Hips	*N=530*	*N=2,136*
(Participants)	*n*=315	*n*=1,272
Development of any pain in the hip		
Events (%)	108 (20.38)	470 (22.00)
Univariate analysis		
Odds ratio (95%CI)	0.91 (0.70 to 1.18)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.99 (0.75 to 1.30)	1 (reference)
Resolution of any pain in the hip		
Events (%)	135 (25.47)	539 (25.23)
Univariate analysis		
Odds ratio (95%CI)	0.98 (0.76 to 1.26)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.93 (0.71 to 1.22)	1 (reference)

* Defined as bisphosphonate use at least three examinations, including baseline and follow-up visits (1-year, 2-year, 3-year, and 4-year). ^Non-users were identified as those who did not use bisphosphonates in the preceding 5 years and at any of the examined time points. Multivariable analysis was adjusted for the baseline values of age, BMI, and analgesic use. CI: Confidence Interval; OA: Osteoarthritis.

Conclusion: The findings from this longitudinal study do not suggest an association between bisphosphonate use and the prevention, slowing, or delay of development and progression of radiographic changes or pain in hip OA among individuals with no or early stages of hip OA over a 4-y follow-up.

OP3
-P504 ROMOSOZUMAB AND DENOSUMAB COMBINATION THERAPY IN POSTMENOPAUSAL OSTEOPOROSIS

G. Adami[1], A. Fassio[1], D. Gatti[1], O. Viapiana[1], C. Benini[1], M. Rossini.[1]

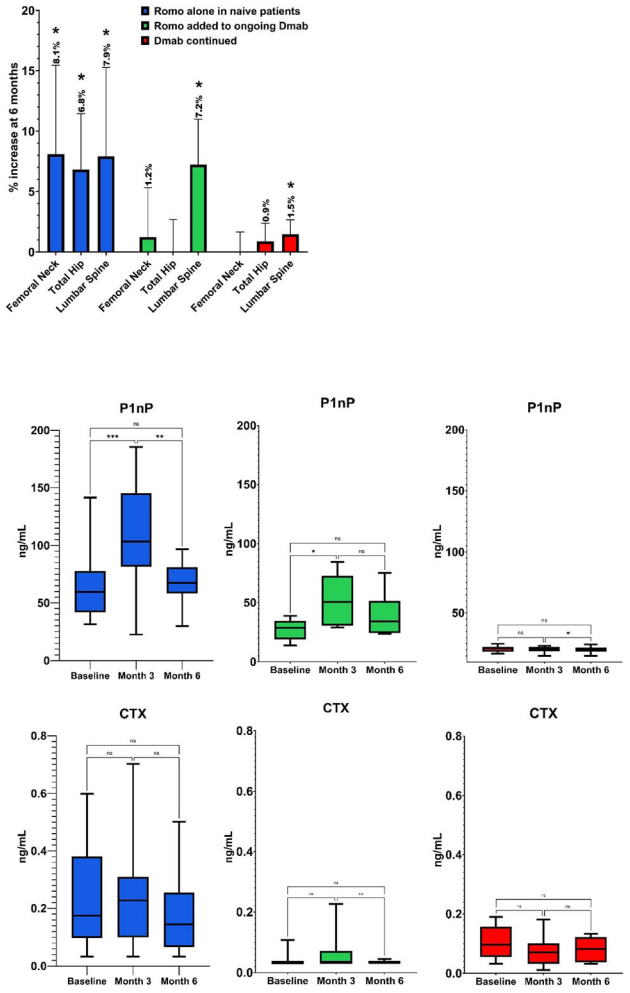
[1]Univ. of Verona, Rheumatology Unit, Verona, Italy

Objective: Optimization of sequential and combination treatment is crucial in shaping long-term management of postmenopausal osteoporosis (OP). We aimed to investigate the effectiveness of the combination of romosozumab to ongoing denosumab treatment.

Methods: We conducted a 6-month prospective observational study on postmenopausal women with severe OP receiving treatment with romosozumab either alone (in patients naïve to treatment) or in combination with ongoing long-term denosumab (> 2 y). We also included a group of patients with ongoing denosumab (> 2 y) as a control group to isolate the specific effects attributable to romosozumab, especially on bone turnover markers (BTMs) and calcium metabolism. We collected serum samples for BTMs, bone modulators and calcium phosphate metabolism at baseline, month 3 and month 6. BMD was assessed at baseline and after 6 months.

Results: 52 postmenopausal women (73 ± 9.6 y) with OP were included in the study. Nineteen received romosozumab alone, 11 received romosozumab combined to ongoing denosumab and 22 continued denosumab alone. Baseline characteristics did not differ significantly between groups at baseline (including FRAXplus

adjusted for recency of the fracture, 10y% fracture risk 37 ± 14 vs. 47 ± 16 vs. 33 ± 13, p NS). BMD increased significantly at all sites at 6 months of follow-up in the romosozumab alone group (femoral neck + 8.1%, total hip + 6.8% and lumbar spine + 7.9%). In contrast, BMD increased significantly only at lumbar spine in the combination group (+ 7.2%) and in the denosumab group (+ 1.5%) (Fig. 1). P1NP increased significantly in romosozumab groups at month 3 (+ 70.4% SD ± 64.5, p 0.0002 in romosozumab alone group; + 99.1% SD ± 100.,5 p 0.027 in combination group). CTX decreased (not significantly) in the romosozumab alone group, whereas was suppressed (< 0.033) at all time points in combination group and denosumab alone group (Fig. 2). We found a small decline in calcium concentration at month 3 in the romosozumab alone group (− 2.8% SD ± 3.8, p 0.037), which settled back to normal concentrations at month 6 (− 0.06% SD ± 4.1, p ns). Calcium did not change in the combination and denosumab alone groups. Sclerostin levels increased steeply in both romosozumab groups and Dkk1 did not change. After accounting for multiplicity using false discovery rate (Q value 5% of FDR), we found a significant positive association between baseline sclerostin levels and delta femoral neck BMD between baseline and month 6 in patients receiving romosozumab alone (r2 0.408, p 0.047).



Conclusion: Romosozumab added to ongoing denosumab resulted in an increase in P1NP and lumbar spine BMD, but not in femoral neck BMD. For patients on denosumab, using romosozumab as an additional treatment appeared to be useful in terms of bone formation markers and spine BMD vs. denosumab alone.

OP4-P512
RELATIONSHIPS BETWEEN SELF-PERCEIVED FRACTURE RISK AND FAMILY HISTORY IN THE HERTFORDSHIRE INTERGENERATIONAL STUDY: THE SAME OR DIFFERENT TO PERCEPTIONS REGARDING HEART DISEASE RISK?

G. Bevilacqua[1], L. D. Westbury[1], C. Cooper[1], E. M. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK

Objective: Self-perceived fracture risk (SPR) has been associated with fracture independent of FRAX objectively calculated risk, and links to osteoporosis medication uptake. A family history of fracture is an important predictor of personal fracture risk. We examined correlates of SPR among UK community-dwelling individuals, aged 21–70 y. We also compared the relationship between SPR and family history of hip fracture with the relationship between self-perceived risk of heart disease and family history of myocardial infarction.
Methods: We studied 303 participants from the Hertfordshire Intergenerational Study. Participants indicated whether they thought that their risk of breaking a bone was 'much lower', 'a little lower', 'about the same', 'a little higher' or 'much higher' compared to others of the same sex. Potential correlates examined included sociodemographic and lifestyle factors, comorbidity level (assessed by number of systems medicated) and family history of hip fracture. Associations between these exposures and SPR were explored using ordinal logistic regression with adjustment for sex and age. Statistically significant correlates ($p < 0.05$) were then included in a mutually-adjusted model along with sex and age. Relationships were compared with those between self-perceived risk of heart disease and family history of myocardial infarction.
Results: Median (lower quartile, upper quartile) age of participants was 56 (43, 61) y. The only factors related to SPR in all analyses were personal fracture history and number of systems medicated. Relationships between SPR and family history of hip fracture were much weaker than relationships between perceived heart disease risk and family history of myocardial infarction ($p = 0.37$ vs. $p < 0.001$).
Conclusion: This analysis highlights differences in perception of risk of clinical outcomes among individuals with a family history of hip fracture vs. myocardial infarction. It suggests that better education around how a family history of hip fracture impacts individual risk might be beneficial to empower individuals to make positive lifestyle and healthcare choices at a point in the lifecourse when such change might have substantial benefit.

OP5-P674
TREATMENT WITH LORECIVIVINT LEADS TO IMPROVED LONG-TERM PATIENT ACCEPTABLE SYMPTOM STATE (PASS) COMPARED TO PLACEBO: DATA FROM PHASE 3 EXTENSION TRIAL

C. Swearingen[1], Y. Yazici[1], J. Tambiah[1], P. Conaghan[2]

[1]Biosplice Therapeutics, Inc, San Diego, USA, [2]Univ. of Leeds School of Medicine, Leeds, UK

Objective: Lorecivivint (LOR) has demonstrated beneficial effects on clinical outcomes in knee OA trials. A "patient acceptable symptom state" (PASS) also provides a clinically relevant assessment (Roos 2019). Year 1 results from a Phase 3 extension study, OA-07 (NCT04520607), with LOR 0.07 mg clinical outcomes including WOMAC Pain [0–100] and Function [0–100], were evaluated for PASS.
Methods: Severe knee OA patients (medial JSW 1.5–4.0 mm) who completed the parent trial were enrolled into the OA-07 extension. A

repeat injection according to original parent randomization (LOR/-placebo (PBO)) was given at OA-07 Year 1 start to blinded patients irrespective of symptom state. PASS is assessed with a 'yes/no' response to the question "Taking into account all the activities you have during your daily life, your level of pain, and also your functional impairment, do you consider that your current state is satisfactory?" at parent study baseline and end of OA-07 Year 1. PASS response and odds ratios (OR; 95% CI) between treatment groups were calculated using baseline-adjusted logistic regression. Differences between treatment groups were explored for patients with a positive PASS.

Results: 276 patients (mean age 61.0 ± 8.2 y, BMI 31.8 ± 4.9 kg/m^2, female 62.7%, Kellgren–Lawrence [KL] 3 45.3%, medial JSW 2.63 ± 0.69 mm) were enrolled. Adverse event data showed LOR appeared safe. Following the repeat injection, compared to PBO at end of Year 1: LOR treatment significantly increased odds of a 'yes' PASS response (LOR 103/121 (85.1%) vs. PBO 93/129 (72.1%), OR 2.45 [1.25, 4.78], P = 0.009) (Figure); patients with a 'yes' PASS response also reported improvements in WOMAC Pain (LOR − 6.8 (± 2.0) vs. PBO − 1.0 (± 2.1), t-test P = 0.049) and Function (LOR − 7.0 (± 1.9) vs. PBO − 2.4 (± 1.9), t-test P = 0.090).

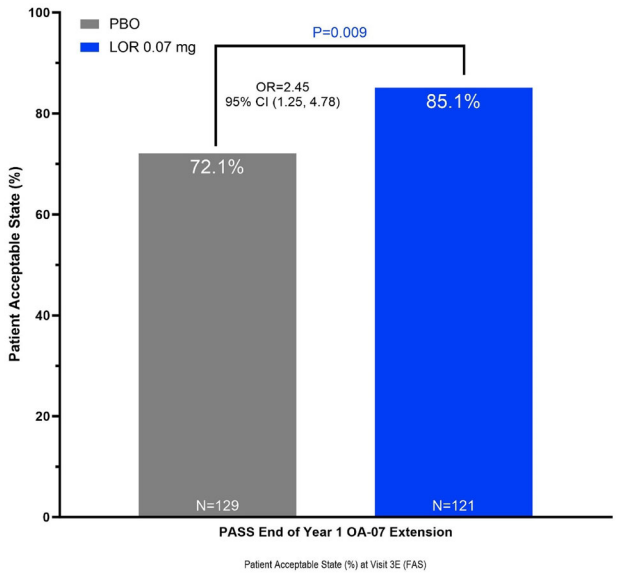


Figure. Patient Acceptable Symptom State between LOR and PBO at End of Year 1 Extension

Conclusion: Compared to PBO, LOR-treated Knee OA patients were significantly more likely to achieve a positive PASS 1 year after a second injection. Pain and function outcomes showed greater improvements for subjects reporting a positive PASS. These data suggest that LOR may provide long-term benefits for knee OA symptoms.

Reference: Roos EM, et al. Br J Sports Med 2019;53:1474.

OP6-P1167
EFFECT OF ROMOSOZUMAB ON TISSUE THICKNESS-ADJUSTED TRABECULAR BONE SCORE (TBSTT) IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS AND DIABETES: RESULTS FROM THE ARCH STUDY

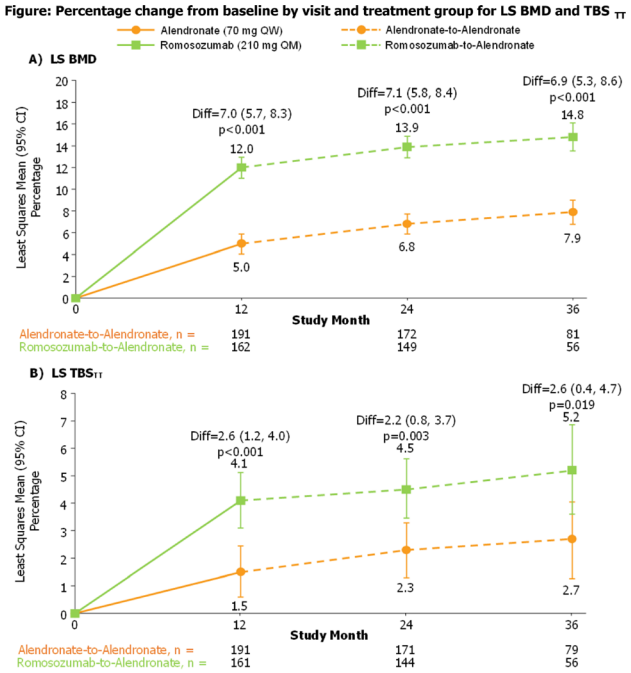
S. Ferrari[1], D. Betah[2], R. Feldman[3], B. Langdahl[4], M. Oates[2], J. Timoshanko[5], Z. Wang[2], R. Dhaliwal[6]

[1]Geneva Univ. Hospital, Geneva, Switzerland, [2]Amgen Inc., Thousand Oaks, USA, [3]MemorialCare Saddleback Medical Center, Laguna Hills, USA, [4]Aarhus Univ. Hospital, Aarhus, Denmark, [5]UCB Pharma, Slough, UK, [6]Massachusetts General Hospital, Boston, USA

Objective: Diabetes mellitus is associated with reduced bone strength and increased fracture risk.[1] TBS, a gray-level texture index derived from lumbar spine (LS) DXA scans, has been reported to be decreased in patients with diabetes and is associated with increased fracture risk, independent of BMD. In the ARCH trial (NCT01631214), romosozumab (Romo) significantly improved bone mass and bone strength, leading to superior fracture risk reduction vs. alendronate (ALN) alone.[2] We examined the effect of Romo-to-ALN vs. ALN-to-ALN on LS BMD and TBS in patients with diabetes in ARCH.

Methods: Postmenopausal women with osteoporosis and prior fracture were randomised 1:1 to Romo 210 mg monthly or ALN 70 mg weekly for 12 months (M), both followed by 24 M ALN 70 mg weekly. This post hoc analysis included participants with diabetes mellitus at baseline (BL) and LS DXA scan measurements at BL and ≥ 1 post-BL visit (Romo/ALN, n = 195; ALN/ALN, n = 165). BMD and TBS (determined by an updated TBS_{TT} algorithm; TBS iNsight^{TM} v4.0 [Medimaps][3] were assessed on LS DXA scans at BL, M12, M24, and M36.

Results: BL LS BMD was – 2.63 for Romo and – 2.89 for ALN; BL LS TBS_{TT} was 1.006 and 1.010, respectively. Romo led to significantly greater gains in LS BMD and TBS_{TT} at M12 vs. ALN; these were maintained after transition to ALN and persisted significantly at M24 and M36 vs. ALN alone (Figure). In the Romo/ALN group, the percentage of women with "normal" TBS values ($TBS_{TT} > 1.074$)[4] increased from 23.6% at BL to 50.0% at M36; those with "degraded" TBS values ($TBS_{TT} \leq 1.027$) decreased from 55.8% to 33.9% ($p < 0.001$). A similar trend, albeit with smaller improvement, was observed for ALN/ALN. TBS_{TT} changes were unrelated to LS BMD changes to M36 (Romo/ALN, $r^2 = 0.1493$; ALN/ALN, $r^2 = 0.0429$).



ALN: alendronate; BMD: bone mineral density; CI: confidence interval; Diff: percentage change from baseline for Romo treatment group minus percentage change from baseline for ALN treatment group; LS: lumbar spine; QM: monthly; QW: weekly; Romo: romosozumab; TBS: trabecular bone score; TBSTT: tissue thickness-adjusted trabecular bone score. LS BMD and TBSTT data were analysed based on repeated measures model adjusting for treatment, presence of severe vertebral fracture at baseline, visit, treatment-by-visit interaction, baseline BMD or TBS value as fixed effects, with machine type and baseline BMD or TBS value-by-machine type interaction as covariates, using either a compound symmetry variance covariance structure for BMD or an unstructured variance covariance structure for TBS.

Conclusion: In postmenopausal women with osteoporosis and diabetes, 12 M of Romo followed by 24 M of ALN significantly improved LS BMD and TBS as measured by TBS_{TT} (independently of BMD) to a greater extent than 36 M of ALN alone. These changes may reflect a greater improvement of bone strength by Romo vs. ALN in patients with diabetes.

References:

1. Walle M, Curr Osteoporos Rep 2022;20:398.
2. Saag K, NEJM 2017;377:1417.
3. Shevroja E, JBMR 2019;34:2229.
4. Hans D, Osteoporos Int 2022;33:2517.

Acknowledgement: Funding by UCB Pharma and Amgen Inc.

OP7-P488
RELATIONSHIPS BETWEEN EARLY LIFE FACTORS AND OSTEOARTHRITIS PAIN: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY

F. J. Kirkham-Wilson[1], L. D. Westbury[1], N. R. Fuggle[1], F. Laskou[1], C. Cooper[1], E. M. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, Southampton, UK

Objective: Relationships between early life factors and musculoskeletal outcomes in later life have been well established, with previous reports suggesting that lower birthweight and weight at one year are associated with development of radiographic osteoarthritis (OA), specifically higher osteophyte number. Here we describe relationships between early life and development of pain among participants with knee OA (Kellgren–Lawrence grade $\geq$ 2) at baseline, who were followed up for around 10 years.

Methods: 75 men and 68 women were recruited in 1998–2004. Baseline knee radiographs were taken and graded according to Kellgren–Lawrence. A mean of 10.8 years later, participants were invited to another research clinic where follow-up radiographs were taken, and pain recorded using WOMAC questionnaires. Questionnaires were administered at both time points to detail lifestyle and anthropometric factors. The analysis sample was restricted to those with radiographic knee OA at HCS baseline (K&L $\geq$ 2 at either tibiofemoral or patellofemoral joint on either left or right side). We also excluded participants with a history of knee replacement at either baseline or follow-up.

Results: Mean (SD) age at baseline was 64.8 (2.8) years; mean (SD) BMI was 27.5 (4.2). 41.3% of men and 50% of women had pain (WOMAC pain score $>$ 0) at follow-up. Mean (SD) birthweight was 3.6 (0.6) kg and 3.5 (0.5) kg in men and women respectively. Greater weight at one year ($p = 0.01$) and greater infant weight gain ($p = 0.02$, independent of birthweight) were related to lower odds of knee pain at follow-up after adjustment for sex and follow-up time. For example, men with knee pain at follow-up had a mean weight at one year of 9.8 kg whereas this was 10.3 kg among men without knee pain at follow-up. Similarly, women with knee pain at follow-up had a mean weight at one year of 9.5 kg in contrast to 9.9 kg among women without pain.

Conclusion: Among subjects with baseline radiographic knee OA, greater weight gain in infancy was protective against pain associated with knee OA, attenuated after adjustment for follow-up osteophyte score. Our findings suggest associations between early life and both symptomatic and radiographic knee OA.

OP8-P935
INCREASED BONE MARROW ADIPOSITY IS RELATED TO HIGHER FRACTURE RISK AND LOWER BONE MINERAL DENSITY IN OLDER SWEDISH WOMEN

M. Zoulakis[1], K. F. Axelsson[1], H. Litsne[1], L. Johansson[1], M. Lorentzon[1]

[1]Univ. of Gothenburg, Dept. of Internal Medicine and Clinical Nutrition, Sahlgrenska Osteoporosis Centre, Gothenburg, Sweden

Objective: Recent research suggests that bone marrow adiposity (BMAT) is associated with osteoporosis and increased fracture risk. However, quantifying BMAT can be challenging mostly because the golden standard for assessment is by MRI, a method limited by low availability and high costs. We recently developed a method to quantify BMAT from HR-pQCT) images.[1] This method was able to explain up to 76% of the variation in the MRI-derived bone marrow fat fraction (BMFF) at the ultradistal tibia. This study aimed to investigate if BMAT, derived from HR-pQCT images, was associated with incident fractures and osteoporosis prevalence in older women.

Methods: In total, 2984 women aged 75–80 y, from the SUPERB cohort, participated in a population-based study between March 2013 to May 2016 and underwent a comprehensive assessment of bone characteristics including bone densitometry (DXA), and HR-pQCT measurements of the ultradistal tibia at baseline. The BMFF was measured as previously described[1] using HR-pQCT images at the ultradistal tibia. Follow-up of x-ray verified incident fractures data was completed in March 2023. Associations between BMFF, anthropometrics, and BMD, were investigated using correlations, linear and logistic regression. Cox regression was used to study the association between BMFF and incident fractures.

Results: BMFF was inversely associated with BMI ($r = -0.22$, $p < 0.001$) and with total hip BMD ($r = -0.50$, $p < 0.001$; $\beta = -0.43$, $p = 0.001$, after adjustment for age and BMI). During a median follow-up time of 7.3 (4.4, 8.4) y, 797 major osteoporotic fractures (MOF), 1069 any fractures, and 235 hip fractures occurred. Increasing

BMFF (per SD) was associated with increased risk of MOF (hazard ratio [HR] = 1.28, 95% CI 1.19–1.38), any fracture (HR = 1.23, 95% CI 1.16–1.31), and hip fracture HR = 1.34, 95% CI 1.17–1.53), All associations, except for hip fracture, remained significant after adjustments for clinical risk factors (CRFs) and femoral neck BMD (Figure).

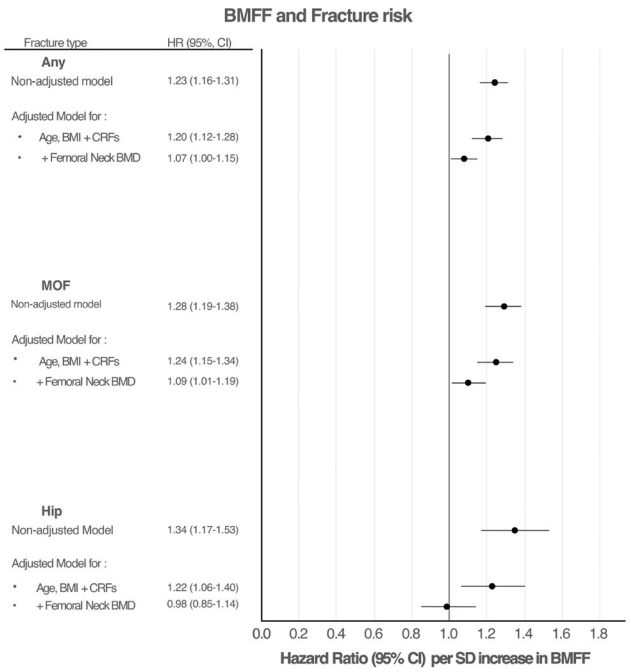


Figure. Forest plot of adjusted and non-adjusted Hazard Ratio (HR) and 95% Confidence Interval (95% CI) per SD increase in bone marrow fat fraction (BMFF) for : Any fracture, Major Osteoporotic Fracture (MOF) and Hip Fracture

Conclusion: Increasing BMFF was associated with lower BMD and with greater fracture risk in older Swedish women.
Reference: (1) Flehr A, et al. Osteoporos Int 2022;33:1545.

OP9-P321
HEALTH-RELATED QUALITY OF LIFE IN SARCOPENIA: CONTENT VALIDITY OF THE SARQOL QUESTIONNAIRE

C. Demonceau[1], B. Voz[2], O. Bruyère[1], J.-Y. Reginster[1], C. Beaudart[3]

[1]WHO Collaborating Centre for Public Health Aspects of Musculo-Skeletal Health and Ageing, Division of Public Health, Epidemiology and Health Economics, Univ. of Liège, Liège, [2]Dept. of Public Health, Univ. of Liège, Liège, [3]Clinical Pharmacology and Toxicology Research Unit, NAmur Research Institute for LIfe Sciences (NARILIS), Dept. of Biomedical Sciences, Faculty of Medicine, Univ. of Namur, Namur, Belgium

Objective: To enhance the evidence supporting the content validity for the Sarcopenia & Quality of Life (SarQoL) questionnaire, a patient-reported outcome measure specifically designed for assess health-related quality of life in individuals with sarcopenia.
Methods: Individual semi-structured interviews targeting the impact of sarcopenia on quality of life were conducted with 17 older Belgian older adults (i.e., aged 65 years and older) who met the EWGSOP2 criteria for the diagnosis of sarcopenia. Afterwards, structured cognitive interviews were conducted to rate the relevance of the current format of SarQoL. Transcripts were qualitatively analysed thematically according to the seven dimensions of the SarQoL questionnaire (i.e., physical and mental health, locomotion, body composition, functionality, activities of daily living, leisure activities and fears).
Results: The majority of the concepts elicited during the semi-structured interviews fit within existing SarQoL dimensions. Importantly, the seven dimensions of SarQoL were consensually considered as relevant by the participants. Some new emergent concepts were identified. While many of them (i.e. fear of the future, need of assistance with particular activities of daily living) could be considered as enrichments of existing dimensions or sub-concepts, other new concepts may highlight two potential dimensions not covered by SarQoL (i.e. self-realization and the adaptation/use of strategies). Cognitive interviews also highlighted that SarQoL items and instructions were clear and comprehensible.
Conclusion: SarQoL, in its current form, demonstrates good evidence of content validity for assessing health-related quality of life in patients with sarcopenia. To ensure SarQoL remains applicable across various individuals with sarcopenia, it is crucial to strike a balance between minimizing patient burden and considering the relevance of new elements. Taking this into account, we do not recommend adding new items or dimensions to SarQoL. Instead, we suggest improving the assessment of quality of life by concurrently incorporating additional validated scales. This would be beneficial for researchers or clinicians who aim to address dimensions such as self-realization and the utilization of adaptive strategies when evaluating the quality of life in a specific targeted sarcopenic population.

OP10-P360
WHAT IS THE EFFECT OF HORMONE REPLACEMENT THERAPY (HRT) ON PREVALENCE, INCIDENCE, AND SEVERITY OF OSTEOARTHRITIS (OA) OF THE KNEE, HIP AND HANDS? A SYSTEMATIC REVIEW

C. W. Hillman[1], K. Marino[2], O. O'Sullivan[1], S. Kluzek[1], R. Atkinson[3], A. Hassan[4]

[1]Univ. of Nottingham, Nottingham, [2]Keele Univ., Keele, [3]Nottingham Univ. Hospitals NHS Trust, Nottingham, [4]Institute of Sport, Exercise and Health (ISEH), London, UK

Objective: Osteoarthritis (OA) is a degenerative disease that can lead to pain, reduced mobility, quality of life and disproportionately affects women[1]. This review explores the effect of HRT on the prevalence, incidence or severity of hip, knee or hand OA in peri- or post-menopausal women.
Methods: A systematic review was performed using PRISMA guidelines and prospectively registered on PROSPERO and a search was conducted (7/10/22) on Medline. Two independent reviewers screened results, extracted the data, and conducted a quality assessment with the Risk of Bias In Non-randomized Studies—of Exposure (ROBINS-E) tool, with a third reviewer for arbitration. Studies were primary research using validated patient reported outcome measures (PROMs) or objective measures of OA.
Results: 27 studies were included, all observational in design. 11 studies assessed hip OA, 19 assessed knee OA, and 8 assessed hand OA. Methods of outcome measurement included radiographic measures (n = 16), joint replacement surgery (indicated by OA) (n = 9), healthcare records (n = 1), and PROMs (n = 1). Most studies (n = 17) were considered to have a'High Risk of Bias'. Positive correlations between HRT use and hip or knee replacement were observed across studies. Results were inconclusive for other outcome measures and the hand.
Conclusion: The included studies varied considerably in terms of confounder adjustment, exposure, and outcome measurement. Despite these limitations, use of HRT appears to be associated with an increased risk of receiving a knee or hip joint replacement indicated by OA. Informed by our critique of the literature, suggestions for high quality research, including appropriately analysed confounders,

appropriate exposure control and use PROMs alongside objective measures of disease are discussed.
Reference: (1) Srikanth VK, et al. Osteoarthritis Cartilage 2005;13:769.

OP11-P1091
GUT MICROBIOTA AND SHORT-CHAIN FATTY ACID SIGNATURES IN POSTMENOPAUSAL OSTEOPOROSIS PATIENTS: A RETROSPECTIVE STUDY

S. Li[1], Y. Zhang[1], C. Ma[1], Q. Dong[2], P. Sun[1]

[1]The First Affiliated Hospital of Guangdong Pharmaceutical Univ., Guangzhou, [2]Yunfu Hospital of Traditional Chinese Medicine, Yunfu, China

Objective: Studies have shown that gut microbiota (GM) and its metabolites, short-chain fatty acids (SCFAs), are associated with the development of postmenopausal osteoporosis (PMO). This study explored the clinical and laboratory evidence of the relationship of GM and SCFAs to PMO and attempted to determine the potential mechanism of action.
Methods: 18 patients (Collected from the First Affiliated Hospital of Guangdong Pharmaceutical University between January 2021 and August 2021) were included in this retrospective study, including 10 PMO women and 8 healthy young women as the healthy control (HC) group from Guangzhou, China. BMD was determined by DXA. The composition of GM and its metabolites, SCFAs, in the fecal samples were measured by 16S rRNA gene sequencing and gas chromatography/mass spectrometry (GC/MS) analysis, respectively.
Results: Compared with HC, PMO group had significantly decreased BMD in lumbar spines 1–4 (BMD_L) and femoral neck (BMD_F). 16S rRNA gene sequencing revealed that, compared with HC, PMO group had a markedly decreased abundance in Subdoligranulum, Norank_f_Muribaculaceae and Alistipes at the genus level. GC/MS analysis indicated that the concentration of propanoic acid significantly dropped in PMO group. Additionally, we found that Subdoligranulum, Norank_f_Muribaculaceae and Alistipes were positively correlated with BMD_L. Subdoligranulum and Norank_f_Muribaculaceae were also positively correlated BMD_F and propanoic acid, while Subdoligranulum is the only species that presented a strong correlation with the levels of acetic acid and butyric acid.
Conclusion: In postmenopausal women, there were evident changes in GM and SCFAs, and these changes were found correlated with patients' BMD. These correlations provide novel insights into the underlying mechanism of PMO development, representative of early diagnostic markers and therapeutic targets that may improve the bone health in postmenopausal women.

OP12-P1122
EXPECTED LOSS OF PRODUCTIVITY FOLLOWING FRAGILITY FRACTURES IN PATIENTS OF WORKING AGE

R. Pinedo-Villanueva[1], J. Griffin[2], L. Wiggins[2], N. Nicola[3], C. Jones[2], M. K. Javaid[1]

[1]Univ. of Oxford/ NDORMS, Oxford, [2]Royal Osteoporosis Society, Bath, [3]Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, UK

Objective: The economic impact of osteoporotic fractures has been extensively studied in terms of health and social care expenditures. However, their impact on productivity losses remains underexplored.
Methods: A survey targeting Royal Osteoporosis Society members was developed to gather data on demographic variables, fractures, and changes in employment status (following Office of National Statistics (ONS) classifications) after fracture. Annual loss of earnings was estimated by apportioning the total number of fractures in England (from National Hip Fracture Database and rule of 5) in people aged 50–67 y (from Oxfordshire Fracture Prevention Service) to each ONS occupation category according to the England 2021 Census. Expected numbers of fractured people by occupation were multiplied by corresponding% of those surveyed taking early retirement or stopping their job due to the fracture, with total loss estimated by applying annualised ONS 2023 weekly earnings.
Results: The survey, conducted from 15/08/2023 for 2 weeks, received responses from 354 adults aged 50–70 y (mean 67.9, 93% women) who reported a fracture. Prior to the fracture, 42.1% were in full-time paid employment, 29.3% in part-time employment, 5.2% were volunteers, 20.1% retired, and 3.4% unemployed. The most common job categories were professional (40.5%) and administrative (17.0%). 61.4% of respondents reported a change in employment after fracture, with 29.0% ceasing work, 24.1% taking early retirement, and 46.3% modifying their job, hours, or duties. Median duration of job absence was 8 weeks (IQR 42–90 d) for those who returned to work. The direct loss of earnings from fractures from early retirement and cessation of work was estimated to be £1.01 billion per annum.
Conclusion: This study provides an estimation of productivity losses resulting from fragility fractures in UK adults aged 50 y and over. Given the aging demographic and policies promoting extended workforce participation, the potential economic benefits of effective osteoporosis management in preserving employment and productivity warrant further exploration.

OP13-P228
THE ICARE FEASIBILITY STUDY: AN INTEGRATED COLLECTION OF EDUCATION MODULES FOR FALL AND FRACTURE PREVENTION FOR HEALTHCARE PROVIDERS IN LONG TERM CARE

A. Papaioannou[1], G. Ioannidis[1], L. Hillier[2], J. D. Adachi[1], A. Costa[3], G. Heckman[4], J. Hirdes[4], J. Holroyd-Leduc[5], S. Jaglal[6], S. Kaasalainen[7], A. Lau[1], C. Mcarthur[8], L. Kane[1], S. Marr[9], S. Straus[10], J.-E. Tarride[3], L. Thabane[1], M. Abbas[11], I. Rodrigues[12]

[1]McMaster Univ., Dept. of Medicine, Hamilton, [2]Geras Centre for Aging Research, Hamilton, [3]McMaster Univ., Dept. of Health Research Methods, Hamilton, [4]Univ. of Waterloo, School of Public Health Sciences, Waterloo, [5]Univ. of Calgary, Dept. of Medicine and Community Health Sciences, Calgary, [6]Univ. of Toronto, Dept. of Physical Therapy, Toronto, [7]McMaster Univ., School of Nursing, Hamilton, [8]Dalhousie Univ., School of Physiotherapy, Halifax, [9]Unity Health Toronto, Hamilton, [10]McMaster Univ., Unity Health Toronto, Hamilton, [11]McMaster Univ., Hamilton, [12]Univ. of Manitoba, Max Rady College of Medicine, Winnipeg, Canada

Objective: To determine the feasibility (recruitment rate and adaptations), with a subobjective to understand facilitators to and barriers of, implementing the PREVENT (Person-centred Routine Fracture PreEVENTion) model in practice. The model includes a multifactorial intervention on improving diet, exercise, environmental adaptations, hip protectors, osteoporosis medications, and medication reviews to treat residents at high risk of fracture. Our secondary outcomes were to determine if there was a change in knowledge uptake and in the proportion of fracture prevention prescriptions post-intervention.
Methods: We conducted a mixed methods longitudinal cohort study in three LTC homes across Ontario. A local champion was selected to guide the implementation of the model and promote best practices. We reported recruitment rates using descriptive statistics and implementation process using content analysis.

Results: Within 5 months, we recruited one for-profit and two not-for profit LTC homes, Home A (120 beds), Home B (425 beds), and Home C (240 beds) and one local champion from each home. We required two months to identify and train the local champion over three 1.5-h train-the-trainer sessions, and the local champion required three months to deliver the intervention to a team of healthcare professionals. Forty healthcare professionals across three LTC homes participated and 88% received education on the LTC recommendations. Homes A, B and C reported increases in the proportion of osteoporosis medication by 62%, 3%, and 42%, respectively before and after intervention. At baseline, 57% of LTC residents are at high risk for fracture, and 17% of these high risk residents are on osteoporosis medications. Benefits of the model include easy access to the Fracture Risk Scale, clear and succinct educational material, and an accredited continuing medication educational module for physicians. Challenges included misperceptions between the differences in fall and fracture prevention strategies and fear of perceived side effects associated with fracture prevention medications.
Conclusion: Our study found an increase in knowledge uptake and the proportion of fracture prevention prescriptions post-intervention. The next steps will be to determine if the adapted PREVENT model reduces the risk and rate of hip fractures in LTC.

OP14
-P754 ANXIETY AND DEPRESSION ARE ASSOCIATED WITH POOR HEALTH BEHAVIOURS AND INCIDENT FRACTURE AMONG WOMEN: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY

L. D. Westbury[1], G. Bevilacqua[1], C. Cooper[1], E. M. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK

Objective: A recent systematic review has highlighted possible links between depression and fracture risk, but no information regarding possible explanatory health behaviours was available. In this study we used a well phenotyped community-dwelling cohort of older adults (the Hertfordshire Cohort Study) to consider these associations further.
Methods: Data from 2997 men and women, aged 59–73 y at baseline, were analysed. At baseline, mental health characteristics and health behaviours were ascertained through clinician-administered questionnaires. Anxiety and depression (mild or worse) were identified by scores of > 7 on the corresponding Hospital Anxiety and Depression Scale. Health behaviours included current smoking, alcohol consumption, diet quality and physical activity (Dallosso questionnaire). Incident fractures were identified using ICD-10 codes from Hospital Episode Statistics data, available from baseline (1998–2004) until December 2018. Health behaviours in relation to anxiety and depression were examined using logistic regression; anxiety and depression in relation to incident fracture were examined using Cox regression. All analyses were sex-stratified and adjusted for age; $p < 0.05$ was regarded as statistically significant.
Results: Prevalence of anxiety was 15% among men and 25% among women; prevalence of depression was 5% among men and 6% among women. Overall, 9% of men and 22% of women had a fracture during follow-up. Among men and women, poorer diet quality and lower physical activity were associated with depression; these health behaviours were also associated with anxiety among men. Current smoking was associated with anxiety and depression among women. Among women, anxiety (hazard ratio (95% CI): 1.34 (1.05, 1.72), $p = 0.019$) and depression (1.76 (1.18, 2.64), $p = 0.006$) were related to increased risk of incident fracture; among men, associations for anxiety ($p = 0.198$) and depression ($p = 0.265$) in relation to fracture were weaker.
Conclusion: Anxiety and depression were associated with increased risk of incident fracture among women, possibly due to their association with poor health behaviours, which are established risk factors for fracture. Preventive strategies are required to address poor health behaviours and mental health among older adults.

OP15-P863
BONE MINERAL DENSITY POST-TREATMENT FOLLOW-UP IN WOMEN WITH ENDOMETRIOSIS TREATED WITH RELUGOLIX COMBINATION THERAPY: SPIRIT PROGRAMME

M. McClung[1], N. Johnson[2], S. L. Ferrari[3], J. S. Perry[4], Y. Zhong[5], R. B. Wagman[5]

[1]Oregon Osteoporosis Center, Portland, USA, [2]Robinson Research Institute, Auckland, New Zealand, [3]Univ. of Geneva, Geneva, Switzerland, [4]Sumitomo Pharma American Inc., Brisbane, USA, [5]Sumitomo Pharma America Inc., Brisbane, USA

Objective: To evaluate BMD changes in women with endometriosis (EM)-associated pain who met prespecified bone loss criteria with relugolix combination therapy (Rel-CT: relugolix 40 mg, estradiol 1 mg and norethisterone acetate 0.5 mg) in the SPIRIT long-term extension (LTE) and underwent post-treatment follow-up (PTFU).
Methods: In the pivotal SPIRIT 1/2 studies, premenopausal women (18–50 y) with moderate-to-severe EM-associated pain were randomised 1:1:1 to receive once-daily Rel-CT, placebo or delayed Rel-CT (relugolix monotherapy/Rel-CT, 12 weeks each) for 24 weeks. Completers could enroll in the 80-week SPIRIT LTE to receive open-label Rel-CT for up to 104 weeks. BMD change was measured by DXA. Women who met protocol-specified BMD loss criteria compared with pivotal study baseline by Week104/the end of treatment were referred for PTFU DXA. BMD recovery was assessed with DXA at month (M)6 and M12 after treatment cessation. Women not meeting the recovery threshold at M6 ($\leq$ 1.5% at the lumbar spine and $\leq$ 2.5% at the total hip) were recommended for an additional scan at M12. BMD percent change from pivotal baseline to last on-treatment, M6 and M12 post-treatment, and last PTFU were summarised by anatomical location.
Results: Of 802 women who entered SPIRIT LTE, 171 (21%) women had protocol-specific BMD loss or BMD loss $> 3\%$ at the lumbar spine or total hip as compared with pivotal study baseline. Of women with BMD loss and underwent M6 or M12 PTFU at lumbar spine, there was evidence of recovery ($> 0\%$ change from last on-treatment DXA) to M6 or M12 PTFU DXA in 27/27 (100%) women previously treated continuously with Rel-CT, and in 21/28 (75%) women initially treated with placebo. Similar trends were observed at the total hip.
Conclusion: In women with EM-associated pain who met prespecified BMD loss criteria in the SPIRIT LTE, there was recovery or trend towards recovery after treatment cessation in all women who received continuous Rel-CT therapy for up to 2 years and in most women who transitioned from placebo to Rel-CT. The benefit/risk profile of Rel-CT remains favourable in women with EM for longer-term treatment.
Acknowledgement: Funded by Sumitomo Pharma Switzerland GmBH.
Disclosures: MRM: consulting and honoraria for speaking (Alexion, Amgen, UCB); consulting (Radius Health); board membership (International Osteoporosis Foundation, American Society of Osteoporosis Providers). NJ: speaker fees and travel (Abbot, Guerbet, Myovant sciences); Board membership (Asia Pacific Initiative on Reproduction, World Endometriosis Society). SLF: grants (Amgen, UCB); Consultant/speaker's bureau/advisory activities (Agnovos, AMGEN, Amolyt, Flowbone, Fresenius, Myovant, Parexel, Radius, UCB); patent licensing (Pro-axis Ltd [IR]). JSP, YZ, and RBW are

employees of Sumitomo Pharma (previously Myovant Sciences Ltd). JSP, and RBW have stock ownership or royalties of Sumitomo Pharma (previously Myovant Sciences Ltd).

OP16-P679
COMPARATIVE ANALYSIS OF TERIPARATIDE AND ROMOSOZUMAB IN PREVENTING SYMPTOMATIC SUBSEQUENT VERTEBRAL COMPRESSION FRACTURE AFTER CEMENTING

W.-H. Kao[1], Y.-H. Chiang[1], W.-C. Lo[1], M.-H. Wu[1], J.- H. Jiann-Her[1]

[1]Taipei Medical Univ. Hospital, Taipei, Taiwan

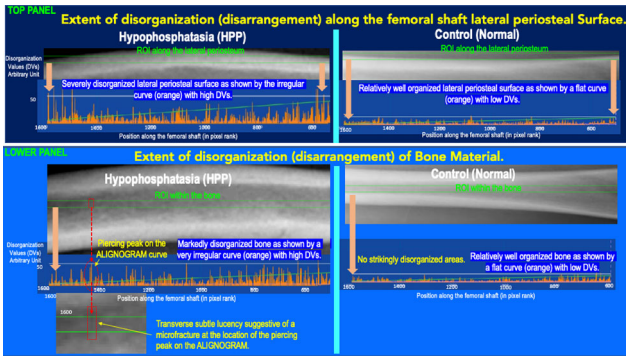
Objective: Subsequent vertebral compression fracture (SVCF) is a common and impactful complication. Because it usually occurs in the subacute phase (< 6 months after cementing of the primary VCF), the timing of prevention is critical. Teriparatide (TP) reduces fracture risk after 6 months but it did not show its effects in the subacute phase. Romosozumab (RM) with a quick onset time has the potential to prevent SVCF in the subacute phase. Our study compares their effectiveness in preventing symptomatic SVCF requiring another operation.
Methods: This retrospective observational study at TMUH includes 226 patients treated with either TP or RM after vertebroplasty or kyphoplasty due to OVCF from January 1, 2021, to June 27, 2023. The characteristics of the patients were reviewed. The primary outcome was a symptomatic SVCF requiring another operation. The secondary outcome was adjacent or non-adjacent fracture.
Results: This study included 118 and 99 patients in TP and RM groups, respectively. Between both groups, we find no significant difference in terms of age, gender, BMI, BMD, and underlying condition including HTN, DM, dyslipidemia, CKD, CAD, autoimmune disease, cancer, COPD, and OVCF at thoracolumbar junction. The rate of SVCF was 4.0% (4/99) in RM group compared to 14.4% (17/118) in TP group with statistically significant difference ($p = 0.01$). The subsequent adjacent fracture rate was 2.0% (2/99) in RM group vs. 11.9% (14/118) in TP group, showing a significant difference ($p = 0.005$). In contrast, no significant difference was observed in the rate of non-adjacent fracture ($p = 0.76$).
Conclusion: RM was associated with reduced symptomatic SVCF compared to TP especially in the subacute phase, highlighting RM's potential advantage in preventing SVCFs on adjacent levels.

OP17-P1136
STANDARD X-RAY IMAGES MAY POTENTIALLY BE USED TO QUANTIFY BONE DISORGANIZATION AND IDENTIFY PATIENTS WITH HYPOPHOSPHATASIA

R. Zebaze[1], C. Shore-Lorenti[1], Z. Simon[1], K. Djopseu[2], T. Makebeh[2], F. Milat[3], R. Ebeling[1]

[1]Dept. of Medicine, School of Clinical Sciences, Monash Univ., Melbourne, Australia, [2]Zeze Co, Yaounde, Cameroon, [3]Hudson Institute of Medical Research, Melbourne, Australia

Objective: The diagnostic issue is that low BMD and structural decay (e.g., cortical or trabecular deficits) are not key features of hypophosphatasia (HPP). Hence, a critical unmet challenge is the lack of a tool to accurately identify bone fragility in patients with HPP. We proposed that the loss of function mutations in tissue non-specific alkaline phosphatase leads to an impaired ability to properly organize (arrange, align) bone. This results in disorganized, damage-prone, and fragile bone. Thus, we hypothesized that quantification of the extent of bone disorganization identifies patients with HPP.
Methods: We studied 6 adult patients with HPP and 15 age- and sex-matched controls, Mean age 48 y (IQR 23–53). The extent of disorganization and features of the most misarranged areas were assessed using a novel validated tool (ALIGNOGRAM). This tool analyses femoral X-rays using AI and novel image processing algorithms.
Results: External shape: HPP patients had markedly more disorganized contours. Their periosteal surface was threefold more disorganized than that of controls; mean disorganization values (DVs) were respectively 3.04 (IQR = 0.21–7.25) in HPP vs. 1.0 (IQR = 0.07–2.53), ($P < 0.0001$). Moreover, the pattern of disorganization of the periosteum was distinctly (threefold) more irregular (Figure, top panel). Bone material was markedly ($\sim$ 3-fold) more disorganized in HPP; mean DVs ($\pm$ SEM) were 3.17 1.1(IQR = 2.37–4.03) in HPP vs. 1.1(IQR = 0.83–1.14) in controls, respectively $P < 0.0001$). Noticeably, there were many random tiny areas with excessively high DVs. They allowed us to identify relatively transverse subtle bands (barely visible unless detected by the tool). These bands were either small lucent lines suggestive of micro (early-stage) fractures, or opaque lines corresponding to micro-sclerosis. No strikingly disorganized areas were detected in controls (Figure, left lower panel).



Conclusion: Abnormal bone disorganization can be quantified from readily available X-ray images as a biomarker to identify HPP patients. This may offer a path for an easy, early routine identification of HPP patients in clinical and research settings. Detection of microfractures (early stage) offers the opportunity for early intervention which may revolutionize HPP treatment. Larger studies are underway.

OP18-P280
ASSESSMENT OF ADHERENCE TO ANTI-OSTEOPOROTIC MEDICATION (AOM) TREATMENT IN THE RISK-STRATIFIED OSTEOPOROSIS STRATEGY EVALUATION (ROSE) SCREENING PROGRAMME: A 10-YEAR FOLLOW-UP STUDY

T. G. Petersen[1], K. H. Rubin[1], M. K. Javaid[2], A. P. Hermann[3], K. Åkesson[4], B. Abrahamsen[5]

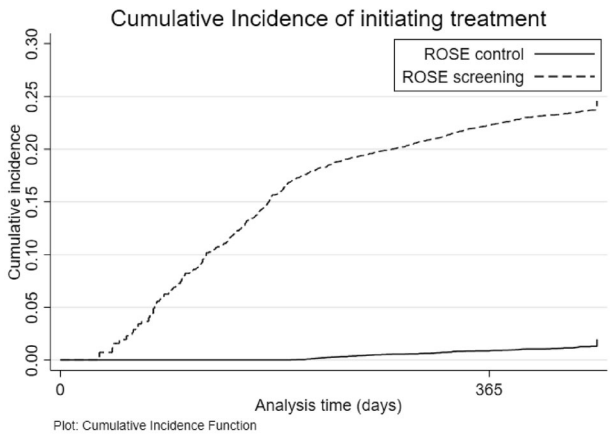
[1]Research Unit OPEN, Dept. of Clinical Research, Univ. of Southern, Odense, Denmark, [2]NDORMS, Univ. of Oxford, Oxford, UK, [3]Research unit of Endocrinology, Odense Univ. Hospital, Odense, Denmark, [4]Clinical and Molecular Osteoporosis Research Unit, Dept. of Clinical Sciences Malmö, Malmö, Sweden, [5]Dept of Medicine, Holbæk Hospital and OPEN, SDU, Denmark

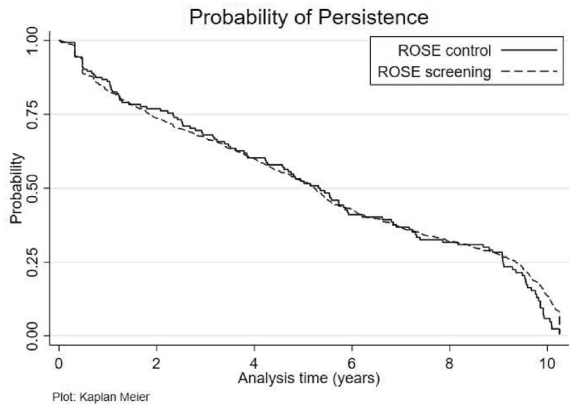
Objective: The ROSE screening programme RCT (Rubin, Osteoporos Int 2018;29:567) offers a comprehensive approach to risk assessment and initiation of anti-Osteoporotic medication (AOM). However, a screening programme's feasibility depends on adherence

to treatment and this could be poorer in those screened as opposed to women actively seeking assessment and treatment. We aimed to investigate the impact of the ROSE screening programme on long-term adherence to AOM treatment.

Methods: Women aged 65–80, residing in the Region of Southern Denmark 2010–2011, were randomized into a screening or a control group. Based on questionnaire data, women in the screening group with a 10-year fracture risk (FRAX^{TM}) of $\geq$ 15% were invited for DXA scanning, following standard AOM treatment in case osteoporosis was identified. We assessed initiation, medication possession ratio (MPR), and persistence to AOM treatment using information on filled prescriptions and in-hospital treatment assi from Danish nationwide registers. Survival analyses, with a maximum follow-up of 10 y, were applied to evaluate differences between the groups.

Results: Among the 15,505 women eligible for the analyses, 971 (6.26%) initiated AOM within one year after the intervention. Significantly more participants in the screening group started on AOM (HR 5.14 (95% CI 4.29; 6.16)) compared to controls (Fig. 1). Persistence was good with 50% remaining on treatment for 5 y or longer and 75% for 2 y or more, with equally good persistence in the screening group (Fig. 2).





Conclusion: Nonadherence presents a significant challenge in osteoporosis. The study demonstrates that the ROSE programme increases initiation of AOM treatment and that screened subjects exhibit similar levels of adherence once they have initiated medication compared to those not screened.

Disclosures: Grant/research support: UCB (MKJ, BA), Kyowa-Kirin (BA). Consultant/advisory activities: UCB (MKJ,APH,BA), Amgen (MKJ,APH,BA), Gedeon Richter (APH,BA), Abbvie (MKJ), Besin Healthcare (MKJ), Sanofi (MKJ), Kyowa-Kirin (BA), Pharmacosmos (BA).

OP19-P1013
EFFECT OF EIGHT MONTHS OF BALLISTIC AND CONVENTIONAL RESISTANCE EXERCISE TRAINING ON BONE STRENGTH IN POSTMENOPAUSAL WOMEN: THE REPROOF STUDY

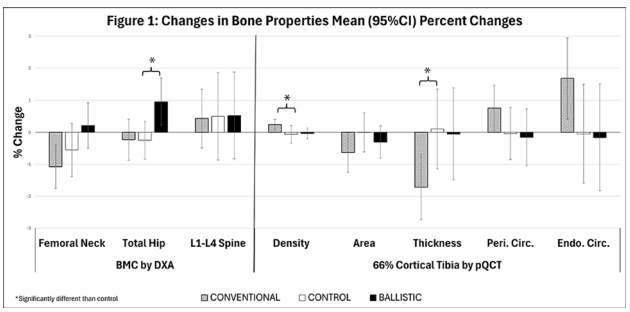
O. Caliskan[1], E. A. Marques[1], J. P. Folland[1], K. Brooke-Wavell[1]

[1]Loughborough Univ., Loughborough, UK

Objective: High-load, progressive resistance training (RT) is recommended for osteoporosis (OP) prevention. Fast ballistic RT involves moving as explosively as possible with a light/moderate load, attempting to launch the load, if possible, to maximize power production throughout the whole movement, but effects on BMD are unknown. We aimed to investigate the influence of ballistic and conventional RT, relative to control, on BMC and BMD in postmenopausal women.

Methods: The resistance exercise programme on risk of osteoporosis and osteoarthritis in females (REPROOF) was an 8-month RCT involving healthy, postmenopausal (> 4 y) women (50–70 y), randomised to ballistic (BRT), conventional (CRT) resistance training and control (CON) groups. Both RT groups attended similar sessions twice a week with hack squats and unilateral calf raises. One repetition maximum (1RM) was measured monthly and used to determine undulating periodized loads between 20–50% 1RM in BRT and 60–80% 1RM in CRT. Both hips and lumbar spine were measured by DXA (GE iDXA), and the tibia was measured by pQCT (Stratec XCT-2000L). Group comparisons were made by regression adjusting for baseline.

Results: 109 women were randomised. 82 completed the study; 63.1 $\pm$ 3.7 y; 24.5 $\pm$ 3.5 kg m^{-2}. Femoral neck T-score $-$ 1.0. DXA scans were available in 28 BRT, 29 CRT and 25 CON and pQCT in 27 BRT, 26 CRT and 23 CON. Mean adherence was $\sim$ 98% in RT groups. BRT showed significant improvements; total hip BMC by mean (95% CI) 0.33 (0.07, 0.59) g (p = 0.02) and BMD by 0.008 (0.001, 0.014) gc m^{-2} (p = 0.02) compared to CON. CRT increased cortical density by 3.18 (0.05,6.31) gcm^{-2} (p = 0.05) but reduced cortical thickness by $-$ 0.07 ($-$ 0.13, $-$ 0.01) mm (p = 0.03) relative to CON in (Fig. 1).



Conclusion: Ballistic RT increased total hip BMC and BMD. This contrasts with previous findings that high-load RT is necessary for bone adaptation. Ballistic RT was feasible in healthy postmenopausal women and may have a role in OP prevention.

OP20-P142
CALCIUM (CA) ISOTOPE COMPOSITION IN SERUM AND URINE FOR THE ASSESSMENT OF BONE CALCIUM BALANCE (BCAB): RESULTS FROM A POSTMARKET SURVEILLANCE CLINICAL FOLLOW-UP STUDY ON 2409 PARTICIPANTS

A. Eisenhauer[1,2], A. Heuser[1,2], J. Oehme[2], M. Lutz[2], M. Müller[2,3]

[1]GEOMAR Helmholtz-Centre for Ocean Research, [2]Osteolabs GmbH, [3]Univ. Clinic Schleswig–Holstein, Kiel, Germany

Objective: Ca isotope marker (CIM) measured in serum (δ44/42Ca-serum) and urine (δ44/42Ca-urine) has been demonstrated in earlier studies to be a sensitive, reliable, and minimal invasive BCaB marker. This study aimed to confirm the validity of the CIM approach to a larger randomized number of people not selected based on specific criteria, but rather showing a wide range of diseases and therapies.
Methods: The 2409 participants of this surveillance study were undergoing CIM testing in 2020–2023. Urine was self-collected, while blood was collected in doctor's office and stored for transport in suitable containers. Individual data were reported: current medical conditions, the last 4 years fracture history, current medication, and intake of supplements, e.g., vitamin D and Ca. Chemical preparation procedures followed standardized procedures. Ca isotopes were measured using a Neptune Plus (Thermo Fisher Scientific) applying a medium mass resolution.
Results: Factors affecting the musculoskeletal metabolism were sensitively reflected by a change in the CIM value in serum and urine. Osteoporosis, osteolytic metastases, hyperthyroidism, specific medications, and antihormone therapies associated with a negative BCaB were reflected by CIM values below the threshold value. Osteoprotective medications such as bisphosphonates, denosumab, and romosozumab, which are associated with a positive BCaB, were reflected by CIM values above the threshold values. The study revealed also that vegans show the highest CIM values possibly reflecting a low Ca intake with increased PTH secretion.
Conclusion: CIM values qualify as a strong and independent marker reflecting BCaB. The high CIM sensitivity allows the early risk assessment of diseases interfering with the musculoskeletal system before symptoms appear. Furthermore, CIM qualifies for near real-time therapy monitoring to ensure sufficient osteoprotective therapy and contributes to a general reduction in fracture risk.

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): ESCEO-OARSI Symposium Abstracts

ESCEO-OARSI1
IMMUNOMETABOLIC ALTERATIONS LINKING OBESITY, DIABETES, OSTEOARTHRITIS AND OSTEOPOROSIS

A. Mobasheri[1,2,3,4]

[1]Research Unit of Health Sciences and Technology, Faculty of Medicine University of Oulu, Oulu, Finland, [2]Department of Regenerative Medicine, State Research Institute Centre for Innovative Medicine, Vilnius, Lithuania, [3]Department of Joint Surgery, First Affiliated Hospital of Sun Yat-sen University, Guangzhou, Guangdong, China, [4]World Health Organization Collaborating Center for Public Health Aspects of Musculoskeletal Health and Aging, Université de Liège, Liège, Belgium

Immunometabolism is a new interdisciplinary field that explores the links between the immunology and metabolism. Although immunometabolism immune has traditionally focused on understanding how cellular metabolic processes influence immune cell function (and vice versa), there is increasing interest in the role of immunometabolic alterations in musculoskeletal disorders, including osteoarthritis (Mobasheri et al., 2017; Zheng et al., 2021) intervertebral disc degeneration (Francisco et al., 2022). There is also emerging evidence to link immunometabolism to subchondral bone changes in osteoporosis. Immunometabolic processes play crucial roles in regulating the activities of musculoskeletal and immune cells within the joint. Osteoporosis is a bone disorder characterized by reduced bone density and increased susceptibility to fractures. While osteoporosis is primarily considered a skeletal disorder, there is growing recognition of the intricate interactions between bone metabolism and systemic metabolism in addition to ageing, hormonal changes, nutrient deficiency and the inflammatory processes that arise as a consequence of obesity, diabetes, insulin resistance, and metabolic syndrome. In the context of osteoarthritis, which is the most common form of arthritis, there is also increasing recognition that immune cells and inflammatory processes contribute to disease pathogenesis. In addition to pro-inflammatory mediators secreted by activated chondrocytes, macrophages, synovial fibroblasts and subchondral bone cells undergo immunometabolic reprogramming in osteoarthritis, resulting in a shift from oxidative phosphorylation toward glycolytic metabolism to meet the increased energy demands associated with the low-grade inflammation within the joint. Broadly, the activation of immune cells in articular cartilage and subchondral bone involves metabolic reprogramming. Mitochondrial dysfunction has been observed in osteoarthritis, further promoting the process of oxidative stress. The metabolites derived from immunometabolic alterations in cellular metabolism, include reactive oxygen species and lipid mediators that can influence the inflammatory responses in the joint. Since ageing is the number one risk factor for both osteoporosis and osteoarthritis, it is important to highlight that cellular senescence also promotes altered metabolism and can contribute to inflammation within the joint. This presentation will discuss the key immunometabolic alterations that occur as a consequence of ageing and diabesity in osteoporosis and osteoarthritis. Targeting obesity and immunometabolism, and the interplay between adipokines and metabolic factors represents a potential avenue for therapeutic interventions in both diseases by modulating metabolic dysfunction in joint tissues.

References

Mobasheri A, Rayman MP, Gualillo O, Sellam J, van der Kraan P, Fearon U. The role of metabolism in the pathogenesis of osteoarthritis. Nat Rev Rheumatol. 2017 May;13(5):302–311. https://doi.org/10.1038/nrrheum.2017.50.

Zheng L, Zhang Z, Sheng P, Mobasheri A. The role of metabolism in chondrocyte dysfunction and the progression of osteoarthritis. Ageing Res Rev. 2021 Mar;66:101,249. https://doi.org/10.1016/j.arr.2020.101249.

Francisco V, Pino J, González-Gay MÁ, Lago F, Karppinen J, Tervonen O, Mobasheri A, Gualillo O. A new immunometabolic perspective of intervertebral disc degeneration. Nat Rev Rheumatol. 2022 Jan;18(1):47–60. https://doi.org/10.1038/s41584-021-00713-z.

ESCEO-OARSI2
IMPACT OF OSTEOPOROSIS AND OSTEOARTHRITIS AS COMORBIDITIES IN THE AGING POPULATION

E. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, Southampton, United Kingdom

Over the coming years, the number of people over the age of 65 is projected to increase substantially. By 2050, 2 billion people will be over 60 years of age, up from 1 billion in 2020 according to the World Health Organization. Conditions of musculoskeletal aging are common; it has been estimated that over 50% American adults > 50 years have osteoporosis or osteopenia, while an estimated 240 million individuals worldwide have symptomatic osteoarthritis (OA), including 10% of men and 18% of women age 60 and older. Meanwhile an increase in life expectancy and a subsequent ageing population have led to a higher prevalence of other chronic, non-communicable diseases that sit alongside conditions of musculoskeletal aging. The World Health Survey carried out between 2002 and 2004 in 70 countries worldwide showed that about 50% of middle-aged (50–64 years) to older (≥ 65 years) adults were multimorbid, having two or more non-communicable diseases, approximately a quarter had three, and one tenth have four or more non-communicable diseases.

There has been a recent interest in whether the existence of musculoskeletal diseases of aging alongside other health conditions might increase risk of adverse events. For example, studies have considered whether the existence of OA as a comorbidity existing with other medical conditions might heighten the risk of adverse outcomes among these individuals, with evidence from one study suggesting that this is indeed the case for risk of hospitalization for most medical conditions, excluding chronic obstructive pulmonary disease, citing 20 more hospitalisations for ambulatory-care sensitive conditions per 10 000 person-years in OA compared with non-OA persons. Similarly, of the comorbid long term conditions studied among Biobank participants, osteoporosis was most strongly associated with adverse outcomes in participants with rheumatoid arthritis compared with those without rheumatoid arthritis or long term conditions, namely a twofold increased risk of all-cause mortality (HR 2.20, 95% CI 1.55 to 3.12) and threefold increased risk of major adverse clinical event (HR 3.17, 95% CI 2.27 to 4.64).

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): WHO Symposium Abstracts

ESCEO-WHO1
WHO SYMPOSIUM ON BONE HEALTH AND AGEING

J. T. Amuthavalli[1]

[1]Coordinator of Bone Health Initiatives, Ageing and Health Unit, Maternal, Newborn, Child, Adolescent Health and Ageing, World Health Organization, Geneva, Switzerland

Introduction: The World Health Organization (WHO), in partnership with the European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis, and Musculoskeletal Diseases (ESCEO) and the International Osteoporosis Foundation (IOF), is working on an evidence-based public health strategy to optimize bone health and prevent fractures among older persons. This initiative aims to contribute to the betterment of the health and well-being of older persons worldwide.

The Bone Health Expert Working Group (BOHEG) was established by WHO to advance technical work in the following areas:

- Developing global estimates on fracture and osteoporosis.
- Reviewing evidence-based interventions to prevent fractures.
- Creating an economic model for an investment case in fracture prevention and care.
- Providing guidance to countries on strengthening national health information systems by integrating osteoporosis and fractures into routine data monitoring.
- Providing guidance to countries on using data to design evidence-informed policies and programs to reduce the risk of fractures in older people.

To this end, the symposium will provide an update on ongoing technical work, present preliminary findings, and discuss future plans.

Chairpersons:

Dr Anshu Banerjee, Director, Maternal, Newborn, Child, Adolescent Health and Ageing, World Health Organization, Geneva, Switzerland

Dr Rene Rizzoli, Chair of WHO-BOHEG and emeritus professor of medicine at the University Hospitals of Geneva, Switzerland

Presentations:

- **OverviewofWHOTechnicalWorkonBoneHealthand Ageing**
- *Dr Amuthavalli Thiyagarajan Jotheeswaran, Coordinator of Bone Health Initiatives, Ageing and Health Unit, Maternal, Newborn, Child, Adolescent Health and Ageing, World Health Organization, Geneva, Switzerland*
- **SystematicreviewofMeasurementPropertiesofinstru-** SystematicreviewofMeasurementPropertiesofinstru- **SystematicreviewofMeasurementPropertiesofinstru-reviewofMeasurementPropertiesofinstrumentstomea-ofMeasurementPropertiesofinstrumentstomeasurethequal-MeasurementPropertiesofinstrumentstomeasurethequal-Propertiesofinstrumentstomeasurethequal-ityoflifeofolderpersonswithSarcopeniaand Osteoporosis**
- *Dr Shaun Louie Sabico, Chair for Biomarkers of Chronic Diseases, Biochemistry Department, College of Science, King Saud University, Riyadh, Saudi Arabia*
- **SystematicReviewofMeasurementPropertiesofInstru-** SystematicReviewofMeasurementPropertiesofInstru- **SystematicReviewofMeasurementPropertiesofInstrumentstoAssessRiskofFractureinOlderPersons—Anupdate**
- *Dr Germain Honvo, Consultant, Ageing and Health Unit, Maternal, Newborn, Child, Adolescent Health and Ageing, World Health Organization, Geneva, Switzerland*
- **WHOGlobalReportonFracturesamongOlderPersons: Anoverview**
- *Dr Amuthavalli Thiyagarajan Jotheeswaran, Coordinator of Bone Health Initiatives, Ageing and Health Unit, Maternal, Newborn, Child, Adolescent Health and Ageing, World Health Organization, Geneva, Switzerland*

Reflections: Prof Jean-Yves Register, President of ESCEO and Director of WHO Collaborating Center for Epidemiology of Musculoskeletal Health and Ageing at the University of Liège, Belgium.

ESCEO-WHO2
SYSTEMATIC REVIEW OF MEASUREMENT PROPERTIES OF INSTRUMENTS TO MEASURE THE QUALITY OF LIFE OF OLDER PERSONS WITH SARCOPENIA AND OSTEOPOROSIS

S. Sabico[1], J. A. Thiyagarajan[2], S. De Baets[3], N. Veronese[4], V. Knoop[5]

[1]Chair for Biomarkers of Chronic Diseases, Biochemistry Department, College of Science, King Saud University, Riyadh, Saudi Arabia, [2]Department of Maternal, Newborn, Child, Adolescent Health and Ageing, World Health Organization, Geneva, Switzerland, [3]Department of Rehabilitation Sciences, Faculty of Medicine and Health Sciences, Ghent University, Ghent, Belgium, [4]Geriatrics Section, Department of Internal Medicine, University of Palermo, Palermo, Italy, [5]Department of Gerontology, Vrije Universiteit Brussel (VUB), Brussels, Belgium.

Introduction: Over the past decades, several tools have been developed and validated to assess quality of life (QoL) in older people with musculoskeletal diseases. To assist various stakeholders in making informed decisions about the most appropriate patient-reported outcome measures (PROMs) to assess QoL, a systematic literature review was performed to comprehensively assess the measurement properties of the different QoL questionnaire available in the scientific literature.

Methods: A systematic review of QoL instruments identified for osteoporosis and sarcopenia was performed using the COSMIN guidelines for systematic reviews of patient-reported outcome measurements. The literature search was conducted up to June 2023 in MEDLINE (Ovid), Embase, PsycINFO (Ovid), and AMED (Ovid). The methodological procedure was in accordance with PRISMA2020 guidelines. Both the quality and the strength of evidence were considered to recommend the use of a QoL questionnaire for sarcopenia or osteoporosis (GRADE). Additional factors were also considered to formulate the final recommendations (i.e. resource requirement, feasibility, acceptability, equity and human rights). The protocol for this research has been registered on PROSPERO CRD42023458414.

Results: A total of 70 studies were deemed relevant for inclusion in this systematic literature review. In these studies, 11 QoL instruments were identified: 1 for sarcopenia (the SarQoL) and 10 for osteoporosis (ECOS-16, IOF-QLQ, JOQOL, OPAQ, OPTQoL, OQLQ, QoLOS-NVFX, QUALEFFO, QUALIOST, and the Triple-Q questionnaire), sometimes presented in different versions. Sample size ranged from n = 30 to n = 1477 with mean age ranging from 59.9–82 years. Thirty-six studies (51%) recruited only women.

Conclusion: The selected studies of the systematic review will be evaluated for content validity and the measurement properties of tools summarized to complete the GRADE evidence. It will be submitted for discussion to the World Health Organization Bone Health Group for final recommendation and publication.

ESCEO-WHO3
SYSTEMATIC REVIEW OF MEASUREMENT PROPERTIES OF INSTRUMENTS TO ASSESS RISK OF FRACTURE IN OLDER PERSONS—AN UPDATE

G. Honvo[1]

[1]Consultant, Ageing and Health Unit, Department of Maternal, Newborn, Child and Adolescent Health and Ageing, World Health Organization (WHO), Geneva, Switzerland

In March 2023, the World Health Organization (WHO) and the European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (ESCEO) launched the WHO Bone Health initiative for advancing WHO work in the field of bone health. The ultimate goal of this initiative is to develop a public health strategy to prevent fracture among adult populations. One of the key deliverables of the agreement between WHO and ESCEO is to conduct a systematic review of studies evaluating instruments to assess the risk of fractures in adults, including older adults, and to critically apprise the measurement properties of these tools. Since the development of the review protocol and its registration in PROSPERO in September 2023, some important steps have been accomplished, including the completion of the title and abstract screening phase. The objective of this presentation is to give an update of this systematic literature review, by presenting the current preliminary data collected and tools retrieved, and to discuss the next steps towards the completion of this important research.

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): EUGMS-ESCEO Symposium Abstract

EUGMS-ESCEO1
OPTIMIZING FRACTURE PREVENTION AND REHABILITATION IN FRAIL OLDER PERSONS: THE EXERCISE AND PHYSIOTHERAPY PERSPECTIVE

D. Skelton[1]

[1]ReaCH, School of Health and Life Sciences, Glasgow Caledonian University, Glasgow, United Kingdom

There is a large body of research that has informed evidence based practice in optimising fracture prevention and rehabilitation in frailer older people [1]. However, there are many barriers to delivery, uptake and adherence to individually tailored, multicomponent exercise programmes. To target frailty and sarcopenia we need to implement supervised progressive resistance training, if we want to focus on fracture prevention we need to implement weight bearing impact and specific balance challenging activities. The World Falls Guidelines also remind us that these interventions need to be a minimum of $3 \times$ pw and for > 12 wks [2]. Supervised delivery of such interventions is lacking in most countries and even where this support exists, uptake and adherence is poor. There is growing evidence that for some individuals, the prescription needs to start with breaking up prolonged periods of sitting and increasing volume of light activity, to support self efficacy with additional behaviour change techniques to progress on, over time, to more effective prescriptions [3]. People with diagnosed osteoporosis should be as active as possible and only avoid activities with a high risk of falls if they are naïve to those activities [4] and strength and balance exercise should be key components [5]. Older adults with multiple long-term conditions are willing to engage in resistance exercise if they are appropriately supported [6]. Physiotherapy input is warranted for the very frail/comorbid/high risk fallers but specific training can support transition to community exercise instructor support to ensure sustainable behaviour change and effective dose over time.

References: [1] Dent E et al. *Curr Osteoporos Rep*. 2023;21(2):205–215; [2] Montero-Odasso M et al. *Age Ageing*. 2022;51(9):afac205; [3] Billot M et al. *Clin Interv Aging*. 2020;15:1675–90; [4] Brooke-Wavell K et al. *Br J Sports Med*. 2022;56(15):837–46; [5] Skelton DA et al. JFSF. 2018; [6] Hurst C et al. *BMC Geriatr.* 2023;23:772.

Disclosure: Skelton is a Director of a not for profit training company, Later Life Training.

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): SICOT-ESCEO-IOF Symposium Abstracts

SICOT-ESCEO-IOF1
TRENDS IN THE MANAGEMENT OF OSTEOPOROTIC PELVIC FRACTURES

M. P. J. Teuben[1]

[1]MD/PhD, Traumasurgeon, Dept. of Traumatology University Hospital, Zurich, Switzerland

Osteoporotic fractures of the pelvis are common in the geriatric population. An ageing population and improved diagnostics will further increase the incidence of these fractures in the future.

In contrast to high-energy pelvic trauma (which occurs in the younger population), fragility fractures are associated with minor injuries in combination with fragile bone structures. Given the differences between the two types of pelvic trauma, different treatment protocols are required. Historically, non-operative management of osteoporotic fractures has been the preferred treatment in geriatric patients. Non-operative management requires a multidisciplinary team and frequent reassessment. Delaying surgerymay put patients at risk of developing immobilization-related complications such as infection, thrombosis and muscle loss. The aim of management in the geriatric patient with pelvic injury is to achieve early mobilization. Surgical treatment may help to achieve this. Surgery for pelvic fractures has evolved over time and minimally invasive procedures have become the standard of care. Further improvements in screw and plate designs, 3D imaging techniques and intraoperative navigation have led to improved accuracy of surgical fixation and lower complication rates. This also provided the impetus for a shift towards early operative treatment of osteoporotic pelvic fractures.

SICOT-ESCEO-IOF2
WILL A TREATMENT PROTOCOL INCLUDING OF CLASSIFICATION PROVIDE CLEAR GUIDELINES FOR OSTEOPOROTIC THORACOLUMBAR SPINE FRACTURES MANAGEMENT? CAN WE AVOID OVERTREATMENT OR UNDERTREATMENT?

N. Trajkovska[1], J. Saveski[1], I. Hasani[2]

[1]Clinical Hospital Acibadem Sistina, Skopje, North Macedonia, [2]University Clinic for Traumatology, Medical Faculty, Skopje, North Macedonia

Objective: Osteoporotic spine fractures (OSF) are major worldwide growing health problem, leading cause of pain, disability, impaired quality of life and morbidity in the elderly.
The best treatment is prevention, treating causes, correcting calcium and vitamin D, exercise program…

Medical treatment includes hormonal replacement, bisphosphonates, calcitonin, raloxifene, teriparatide… Nonsurgical treatment includes bedrest, cast/brace, analgesia…

If conservative treatment fails, surgery—minimally invasive (vertebroplasty or kyphoplasty) or invasive, open approach to the spine is indicated.

The fracture acuity is evaluated with MRI. Appropriate time for surgery is 3 weeks to 3 months after injury, unless dealing with pseudoarthrosis or late neurological deficits.

When facing this group of patients, it is usually hard to choose adequate treatment. It is a real challenge to find balance between overtreatment and undertreatment, since both are trigger for future complications.

Material and methods: We have evaluated retrospectively patients with OSF treated in our hospitals from June 2020 to June 2023. The diagnostic protocol, the OF classification and score, the chosen treatment, the results, the need of surgery after fail of previous treatment were analysed.
Results: We have found the OF classification and OF score reliable tool for choosing adequate treatment. The score incorporates level of pain, bone density, acuity of the fracture, neurological deficits and general health status, beside the classification.
Discussion: Because of number of comorbidities that geriatric patients have, it is crucial to apply treatment protocol in clinical setting for treating OSF while trying to do no harm.
Conclusion: When dealing with OSF it is imperative to use OF classification and OF score for choosing appropriate treatment in order to lower the incidence of complications and additional surgical procedures in elderly. Undertreating or overtreating them leads to complications, local and systemic.

SICOT-ESCEO-IOF3
OSTEOPOROTIC HIP FRACTURES

I. Hasani[1], J. Saveski[2], N. Trajkovska[2]

[1]University Clinic for Traumatology, Medical Faculty, Skopje, North Macedonia, [2]Clinical Hospital Acibadem Sistina, Skopje, North Macedonia

Although very important Osteoporotic Hip Fractures, because almost 1/3 of our geriatric patients are fatal, are the most contemned fractures in our everyday praxis and most neglected ones, often operated by the youngest surgeons or residents under supervision. Geriatric hip fractures are often in the shadow of other young injured patients on the wards and also often subject to nonstandard treatment in the same centers. There is also documented substantial hospital variation in adherence to evidence-based guidelines used for the treatment of hip fractures. Non-permanent following of the guidelines puts the patients at a significant risk of inequality in treatment and poor outcomes.

Fast-track strategy, Insisting on separate orthogeriatric departments, with standardized treatment and fast-track strategy for hip fracture patients, and its implementation is very beneficial for osteoporotic–geriatric hip fractures!

Unrealized needs for osteoporotic hip fractures are implant stability and bone implant anchorage!

Advances in the locking concept of the nails; anchorage with double screws or PMMA augmentation, and rigid femoral neck system for treating neck fractures have been introduced recently dramatically changing the perspective of patients with osteoporotic hip fractures.

Even though these fractures are the "beginning of the end" for almost 1/3 in the first year, of the injured frail and elderly injured; decreasing the excess mortality should be every surgeon's target for enabling our beloved oldies to live beside us as much as possible.

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): ESCEO Symposium Abstracts

ESCEO1
REMS: HOW DOES IT WORK AND WHAT DO WE MEASURE?

A. Diez-Perez[1]

[1]Hospital del Mar Institute of Medical Investigation, Barcelona, Spain

REMS (Radiofrequency Echographic Multi-Spectrometry) is a measurement that allows bone health status assessment and fracture risk prediction by means of a rapid ultrasound scan on reference axial sites of the skeleton. It operates in the following steps: ultrasound scan (software guided); B-mode image reconstruction; and radiofrequency signal analysis (with automatic identification of bone interfaces and ROIs on raw signals).

The acquisitions are performed at the lumbar vertebrae and the femoral neck and the data analyzed allowing the identification of target bone structures within the sequence of echographic images acquired on the patient by performing a number of steps on each acquired frame. These results are compared with a reference database yielding quantitative parameters (BMD, T-score and Z-score) and qualitative parameters (fragility score). This Fragility Score is dimensionless and measures bone fragility in a scale from 0 to 100, where 100 indicates the maximum similarity with the fractured model (i.e. maximum bone fragility) and vice versa. These levels are then used for the calculation of the 5-year risk of fracture (hip and major).

REMS automatically eliminates raw signals that belong to calcifications, osteophytes and other artifacts. The acquisition is fast (80 s for spine and 40 for femur), convenient for the patient and the operator, operator's training easy, the selection of ROIs is automatic (independently of the operator), accessible (portable) and radiation free.

REMS automatically eliminates raw signals that belong to calcifications, osteophytes and other artifacts avoiding the overestimation of lumbar BMD associated to DXA.

The technique has been evaluated, showing for BMD measurements high sensitivity and specificity ($> 91\%$, good diagnostic agreement with DXA and the intra-operator CV is 0.323–0.38% with an inte-roperator CV of 0.48–0.54. For Fragility Score the intra-operator CV is 0.43–0.49 and the inter-operator CV 0.64–0.73.

Ongoing development is in progress for the measurement of muscle strength and the results show a vey high correlation with hand grip strength values ($r = 0.95$, $p < 0.0001$).

In summary, REMS is a novel technique for the measurement of BMD (BMD, T-score) and bone fragility (Fragility Score), is radiation-free, can be used for mass screening or diagnosis and for short-term follow up and has a good accuracy and precision. Since is portable can be used in ambulatory settings and private offices as well as at the bedside. Avoids some artifacts of DXA and new developments (Fragility Score, Muscle Strength) may expand the clinical applicability of the technique.

ESCEO2
WHAT IS THE CONTRIBUTION OF REMS TO THE MANAGEMENT OF POST-MENOPAUSAL OSTEOPOROSIS?

N. Harvey[1]

[1]MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom

Radiofrequency echographic multi-spectrometry (REMS) is a novel technology based on the analysis of raw unfiltered ultrasound signals acquired during an echographic scan of either the lumbar spine or femoral neck. Its output can be taken as a REMS BMD T-score or a Fragility Score measure. Measures are derived from the comparison of echographic spectra of osteoporotic versus normal bone and have been demonstrated in several studies to be well calibrated with DXA BMD at the corresponding site. Discrimination of past or future fractures appears similar between REMS and DXA BMD T-score with the novel Fragility Score measure potentially yielding somewhat greater performance. The technique systematically removes effects of artefacts such as osteophytes, a property which has been validated to a limited extent in clinical studies. Given the non-ionising nature and portability of the technology, REMS is likely to provide novel opportunities to broaden access both within and without healthcare settings. More information is needed about the predictive capacity of these measures in relation to DXA BMD and FRAX probability, together with dependency on other risk factors, in order to fully understand the role of the technology in the broader context of fracture risk assessment.

ESCEO3
WHAT IS THE CONTRIBUTION OF REMS IN THE MANAGEMENT OF MUSCULOSKELETAL HEALTH, OUTSIDE OF POST-MENOPAUSAL OSTEOPOROSIS?

M. L. Brandi[1]

[1]Metabolic Bone Diseases Unit, Dep. of Surgery and Translational Medicine, University of Florence, Florence, Italy

Objective: Although musculoskeletal diseases are more often observed in elderly people and/or post-menopausal women; younger-adults, pregnant women or secondary osteoporosis should be included in the comprehensive prevention measures: widespread BMD and muscle disease evaluation in this population are commonly lacking, due to very limited research focus. In this context, the aim of this work is to illustrate the contribution of Radiofrequency Echographic Multi Spectrometry (REMS) in the management of musculoskeletal health outside of post-menopausal osteoporosis.

Material and methods: An up-to-date peer-reviewed research on the REMS application outside of well-known post-menopausal osteoporosis.

Results: Several clinical studies confirmed REMS diagnostic validity and show that, thanks to its radiation free nature and high precision, it can be applied for prevention programs, early diagnosis in clinical practice, risk fracture prediction and short-term monitoring. REMS can be used in various categories of fragile patients, both for primary and secondary osteoporosis.

Scientific evidences demonstrated a BMD reduction in pregnant women with respect to non-pregnant ones and from the first to the third trimester of pregnancy. REMS can be successfully applied in young subjects suffering from Anorexia Nervosa with previous vertebral fragility fractures confirming a high risk of bone fragility in these patients. Furthermore, clinical data confirmed that REMS investigation improved osteoporosis diagnosis also in individuals suffering from type II Diabetes or chronic kidney diseases (CKD), including patients undergoing kidney transplant and peritoneal dialysis (PD). Lastly, REMS diagnosis is not affected by osteoarthritis-related bone deformities nor by the presence of aortic calcifications, that in contrast, induce an artefactual BMD alteration with standard DXA. This technique allows reliable estimation of muscle strength in both pathological and healthy subjects, in order to monitor the onset and evolution of diseases like sarcopenia by early detecting the corresponding tissue deteriorations through dedicated REMS parameter.

Conclusion: On the base of the mentioned evidences, REMS can improve the management of musculoskeletal health and fracture risk in the clinical routine as stated in the Italian Health Ministry Guidelines, also outside of post-menopausal osteoporosis by reaching as well subjects who wouldn't have access to DXA.

References:

- Pisani et al., Int. J. of Bone Fragility 2023
- Degennaro et al.,Europ. J. of Obst & Gyn and Reprod Biol 2021
- Ramirez Zegarra et al., ACER 2024
- Pisani et al., ACER, 2023
- Fassio et al., ACER, 2022
- Caffarelli et al., BMC Musculoskelet. Disord., 2022

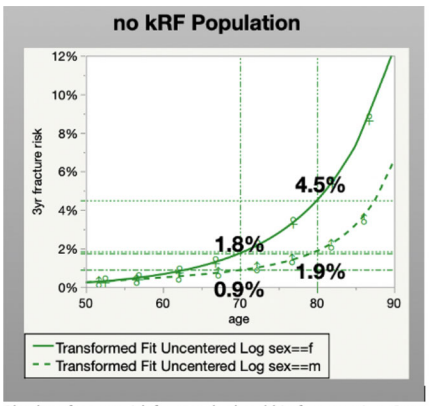
World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): ESCEO-DVO Symposium Abstracts

ESCEO-DVO1
THE NEW DVO OSTEOPOROSIS GUIDELINE 2023—A PARADIGM SHIFT FOR THE GERMAN SPEAKING COUNTRIES

F. Thomasius[1,2,3]

[1]Frankfurter Hormon and Osteoporosezentrum, Frankfurt, Germany, [2]Chairwoman of the DVO Guidelines Commission, Frankfurt, Germany, [3]President of the German Society for Osteology, Frankfurt, Germany

The key recommendations of the completely revised 2023 Guideline for the Prevention, Diagnosis and Treatment of Osteoporosis in Postmenopausal Women and Men over 50 Years of Age (1) of the German Dachverband Osteologie (DVO, an association of 20 societies for skeletal research in Germany, Austria and Switzerland) have changed. Following the highest level of evidence and strict quality criteria (DELBI, OXFORD, and SIGN) and approved as S3 guideline by the AWMF (Association of the Scientific Medical Societies of Germany; No 183-001), this guideline is based on a comprehensive systematic literature review (2267 publications) to address PICO questions (Population-Intervention-Comparison-Outcome) most relevant to clinical practice. Fracture risk, based on hip and vertebral fracture risk, now is derived for a 3-year time horizon instead of 10-years. The absolute fracture risk for vertebral and hip fractures is shown in Fig. 1. Other changes include (1) the prioritization of 33 clinical risk factors, (2) the omission of a fracture risk threshold for initial diagnostics if any of these clinical risk factors is present in a medically relevant constellation, (3) the introduction of a three-tiered fracture risk-based therapy threshold (removal of the requirement for a T-Score < -2), separating indications for antiresorptive versus osteo-anabolic treatment. These changes represent a paradigm shift in the diagnostic and therapeutic approach to osteoporosis, aiming at more comprehensive patient-specific diagnostic and therapeutic guidance to reduce the substantial diagnostic and treatment gap that exists for osteoporotic patients.



Absolute fracture risk for vertebral and hip fractures in a German health insurance data set; clinical risk factors are not included. F female, m male (1)

(1) DVO-German Guideline for the diagnosis and therapy of osteoporosis, Version 2.1, 13th Nov 2023, https://register.awmf.org/de/leitlinien/detail/183-001, last access 12th Feb 2024,

ESCEO-DVO2
DISEASE MANAGEMENT PROGRAM OSTEOPOROSIS—A POLITICALLY DECIDED STRUCTURED CARE PROGRAM FOR GERMANY

A. Kurth[1]

[1]Dep. of Orthopaedic and Trauma Surgery, Marienhaus Klinikum, Mainz, Germany

Disease management programs (DMPs) are structured treatment programs for chronic diseases that aim to optimize medical treatment in the long term and improve and maintain the quality of life of those affected. Further aims are to avoid complications and consequential damage or concomitant illnesses as far as possible.

DMPs include regular medical appointments with consultations and examinations as well as the provision of background information, for example through training courses. Medical practices that offer treatment as part of the DMP osteoporosis must meet certain requirements and comply with defined quality standards.

This is also intended to improve cooperation between the various specialist disciplines and facilities that care for a patient, for example between general practitioners and specialists, clinics and rehabilitation facilities.

Once osteoporosis has been diagnosed, the coordinating doctor can enrol the patient in the DMP and draw up an individual treatment plan based on the DMP guidelines.

This includes drug treatment (anti-resorptives, osteoanabolic agents, calcium and vitamin D) and other therapeutic measures, training appointments and regular check-ups.

The individual treatment steps, examination and treatment results are regularly documented.

Participation in a DMP has advantages for patients and doctors:

The doctors involved must take an interest in the subject of osteoporosis and undergo further training, thereby gaining continuously—updated knowledge, even for the care of complex cases of osteoporosis.

With the correct indication for enrollment in the DMP osteoporosis, colleagues no longer have to deal with the cost pressure for their therapy.

The documented information on the course of the disease and the therapy avoids duplicate examinations and incorrect medication. Furthermore, all therapists and doctors are required to coordinate their measures with each other.

Special training programs and structured exercise programs can make it easier for chronically ill osteoporosis patients to be well informed and actively involved in their treatment and to actively do something for their bone health in addition to drug therapy.

As medical knowledge is constantly growing, the specifications for the DMP osteoporosis must be regularly updated.

As the DVO's osteoporosis guidelines are updated every three years and therefore incorporate the latest evidence for diagnosis and treatment, it can be assumed that this content will also be taken into account when the DMP is updated.

ESCEO-DVO3
A NEW CASE FINDING ALGORITHM ACCORDING TO FRACTURE RISK

C.-C. Glüer[1], K. Engelke[2], F. Thomasius[3], W. D. Leslie[4]

[1]Christian-Albrechts-Universität zu Kiel, Section Biomedical Imaging-Department of Radiology and Neuroradiology-UKSH,, Kiel, Germany, [2]Friedrich Alexander University Erlangen Nürnberg, Department of Medicine 3, Erlangen, Germany, [3]Frankfurter Hormon- und Osteoporosezentrum, Frankfurt, Germany,

[4]Departments of Internal and Radiology, University of Manitoba, Manitoba, Canada

As key element of the 2023 DVO osteoporosis guidelines, a new fracture risk algorithm is now used for case finding of patients in need of therapy. Treatment decisions are based on fracture risk estimates derived from (i) a base risk of subjects without any clinical risk factors (cRFs), (ii) cRFs present in a patient, selected from 33 literature-validated cRF candidates, (iii) estimation of 3-year risk of fracture, (iv) considering incident hip fracture (HF) or vertebral fracture (VF), along with (v) DXA at total proximal femur and lumbar spine.

In order to assess whether an expanded list of cRFs, 3 yr risk instead of 10 yr risk, and inclusion of DXA of the spine would increase predictive power, we have tested corresponding more complex risk assessment models in the Manitoba BMD registry, for women only. Risk performance was based on Cox proportional hazard models. As presented at ASBMR 2023, AUCs of ROC analysis increased substantially and significantly (0.848 vs 0.830 for HF and 0.766 vs 0.727 for VF) when adding additional cRFs to the basic set (which included age, BMI, parental hip fracture, smoking, alcohol, glucocorticoid, RA and prior fracture). DXA of the spine added predictive power over DXA of the total hip for vertebral fracture prediction only. When comparing full models including cRFs and DXA for 3 yr and 10 yr follow-up, AUCs were larger for the 3 yr model (0.884 vs 0.825 for HF and 0.795 vs 0.771 for VF). These results motivated us to implement the new algorithm, first in a simplified version restricted to inclusion of only the patient's two strongest cRFs and limited to DXA of the total hip. Patients with a combined 3 yr-risk of HF or VF exceeding 3% should consider antiresorptive medication; if the risk exceeds 5% they should receive antiresorptive medication, and if the risk exceeds 10%, osteanabolic medication is recommended. An outline of the risk assessment algorithm will be presented.

ESCEO-DVO4
MEDICAL EDUCATION IN OSTEOLOGY CARE: FROM BASIC RESEARCH TO CLINICAL COMPETENCE CERTIFICATION

R. Schmidmaier[1]

[1]Department of Medicine IV, LMU University Hospital, LMU Munich, Munich, Germany

Objective: To reduce the treatment gap of osteoporosis by evidence based medical education.

Material and methods: Presentation of current medical education research issues and of the competence based DVO curriculum for certification in clinical osteology.

Results: There is a large treatment gap in osteoporosis, which is mainly due to diagnostic errors. Most of these are cognitive errors. Studies have shown that more than 80% of diagnostic errors are related to the diagnostic process, not only to lack of knowledge. Diagnostic competence can be fostered by scaffolding, either representational or process-related. However, effects are dependent on learner prerequisites. Therefore, future studies will focus on individualized adaptive scaffolding. The German-speaking umbrella organization of scientific osteology organizations (DVO) provides a structured, competence-based curriculum that leads to a stepwise certification in excellent osteology care. Residents may achieve the "certificate for general osteoporosis care" after a specialized 2-day training course. Medical specialists may achieve the "certificate for specialized osteoporosis care" after hands-on training and additional CME courses. The certificate "osteologist DVO" additionally requires extensive diagnostic skills and at least three years of supervised practice. All certificates need to be updated after five years by proofing intensive patient care and CME.

Conclusions: Evidence based medical education in osteology care may reduce the treatment gap in future. Prospective, multicentre intervention trials are needed to proof this.

Acknowledgements: I am grateful to the members of the DVO and to the organizers of the osteology certification curriculum (OSteology ACademy, OSTAK).

Disclosures: Chairman of the DVO (Dachverband Osteologie). Funding by the German Research Foundation (DFG), DFG Research Unit FOR2385.

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): Meet-the-Experts Abstracts

MTE1
COMPLEX OSTEOPOROSIS: CASE HISTORIES

E. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre SO16 6YD, Southampton, United Kingdom

This interactive meet the professor session aims to cover discussion of many of the challenging management situations faced by clinicians who care for patients with metabolic bone disease. Discussion will be grounded in available literature and will include discussion of management of patients with Duchenne muscular dystrophy; women receiving therapy for breast cancer; patients with a history of eating disorders and young adults with osteogenesis imperfecta. Participants are invited to share their thoughts and personal experience.

MTE2
GUIDELINES FOR MANAGEMENT OF HYPOPARATHYROIDISM

M. L. Brandi[1]

[1]Fondazione FIRMO and Observatory for Fragility Fractures, Florence and University San Raffaele, Milan, Italy, Florence, Italy

Hypoparathyroidism (HypoPT) is a rare disorder characterized by hypocalcemia in the presence of a low or inappropriately normal parathyroid hormone level. HypoPT is most commonly seen after neck surgery, which accounts for approximately 75% of cases, whereas approximately 25% have HypoPT due to nonsurgical causes.

The 2022 International Task Force guidelines for chronic HypoPT was published in the Journal of Bone and Mineral Research. These guidelines update the original guidelines published in 2016, and include new information from literature published since then.

This clinical practice guidelines address the prevention, diagnosis, and management of HypoPT and provides evidence-based recommendations. The HypoPT task forces included four teams with a total of 50 international experts including representatives from the sponsoring societies.

The guidelines also enlisted a number of areas needing further studies.

This together with the astonishing pharmacological developments in this area open to a revision of these guidelines in the future.

By now these guidelines are intended to frame the diagnosis and care of patients with chronic hypoparathyroidism for at least the next five years.

MTE3
MACHINE LEARNING AND COMPUTER VISION—THE FUTURE OF FRACTURE RISK ASSESSMENT?

N. Fuggle[1]

[1]Associate Professor, MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom

Identifying those individuals at risk of fracture is key to effective management of osteoporosis as identification can lead to treatment, treatment can lead to reduction in fractures and reduction in fractures to improvements in quality of life for our patients.

Effective tools exist for the assessment of fracture risk. These include FRAX® which uses a combination of clinical risk factors and bone mineral density to provide a 10-year risk of major osteoporotic fracture and hip fracture. FRAX® is easily deployable and has been tailored to the vast majority of countries across the globe.

'Machine learning' refers to the use of computer systems which are able learn and adapt without requiring specific, prescriptive instructions but by developing algorithms and mathematical models to independently analyse and make inferences from data.

'Computer Vision' is the field of computer science which examines the ability of computers to identify patterns and objects in images via interpretation of shape, texture and other features.

There has been a recent explosion of research which is attempting to identify whether machine learning and computer vision can contribute to fracture prediction in a way which may be complementary to FRAX® and other fracture prediction tools.

In this session we will introduce the basic concepts of computer vision and look examine the research which is attempting to use these techniques in the field of fracture prediction.

MTE4
AN INTEGRATED APPROACH TO NUTRITION IN MUSCULOSKELETAL DISEASE

N. Veronese[1]

[1]Associate Professor in Geriatrics and Internal Medicine, University of Palermo, Palermo, Italy

Nutrition plays a pivotal role in the management and prevention of musculoskeletal diseases, encompassing conditions such as osteoporosis, osteoarthritis, rheumatoid arthritis, and sarcopenia. This lecture will discuss an integrated approach to nutrition aimed at optimizing musculoskeletal health and function.

Firstly, dietary factors influencing bone health are explored, including calcium, vitamin D, protein, and other micronutrients. Adequate intake of these nutrients is essential for bone mineral density and fracture prevention, for example. Furthermore, the interplay between inflammation, oxidative stress, and dietary patterns in arthritis will be examined. A diet rich in anti-inflammatory foods, such as fruits, vegetables, and omega-3 fatty acids, may mitigate symptoms and disease progression in rheumatic conditions.

Moreover, sarcopenia, characterized by age-related muscle loss and decreased strength, is addressed in relation to protein intake, amino acids, and resistance exercise. Optimizing protein quality and quantity, along with regular physical activity, are paramount for preserving muscle mass and function. Additionally, the impact of obesity on musculoskeletal health is discussed, highlighting the importance of weight management strategies and dietary modifications in reducing joint stress and inflammation.

Furthermore, the role of personalized nutrition interventions and supplementation in musculoskeletal disease management is emphasized. Tailoring dietary recommendations based on individual needs, genetic predispositions, and metabolic factors can enhance treatment outcomes and quality of life for patients. Moreover, emerging research on nutraceuticals, such as collagen peptides and polyphenols, suggests potential therapeutic benefits in supporting joint health and cartilage integrity.

In conclusion, an integrated approach to nutrition is essential for optimizing musculoskeletal health across the lifespan. By addressing dietary factors that influence bone density, inflammation, muscle mass, and weight management, healthcare professionals can empower individuals to prevent and manage musculoskeletal diseases effectively. Future research should continue to explore the intricate relationship between nutrition and musculoskeletal health, ultimately

paving the way for personalized dietary interventions and improved clinical outcomes.

MTE5
"OMICS" IN THE FUTURE OF BONE HEALTH ASSESSMENT

E. Cavalier[1,2]

[1]PhD, EuSpLM, Liege, Belgium, [2]Head, Department of Clinical Chemistry, University of Liege, CHU de Liege, Liege, Belgium

In the ongoing quest to unravel the molecular complexities underlying osteoporosis, researchers have turned to omics sciences, including genomics, proteomics, and metabolomics, for a more nuanced understanding.

Genomics offers insights into the genetic factors contributing to osteoporosis susceptibility. Understanding genetic predispositions allows for more accurate risk assessments, although it's essential to acknowledge the multifactorial nature of the disease.

Proteomics, with its focus on the entire protein complement, provides valuable information about the dynamic interplay of proteins involved in bone metabolism. While offering promising avenues for therapeutic exploration, it's important to recognize the challenges of translating proteomics findings into clinical applications.

Metabolomics, examining small molecules and metabolic pathways, complements the picture by identifying potential biomarkers and metabolic alterations associated with osteoporosis. However, the intricacies of linking metabolomic changes to disease mechanisms necessitate cautious interpretation.

Integrating these omics approaches presents a comprehensive but evolving perspective on osteoporosis. Recognizing the limitations, such as the need for larger-scale validation studies and addressing the complexities of translating research findings to clinical practice, is crucial.

In navigating the omics era of osteoporosis research, a balanced acknowledgment of both the advancements and the challenges is paramount. While omics sciences hold promise for deepening our understanding, caution and ongoing scrutiny are essential to ensure the responsible and realistic application of these insights in clinical settings.

MTE6
GUIDELINES FOR MANAGEMENT OF PRIMARY HYPERPARATHYROIDISM

M. Lazaretti-Castro[1]

[1]PhD, Professor Endocrinology, Escola Paulista de Medicina, Universidade Federal de Sao Paulo, Sao Paulo, Brazil

Primary hyperparathyroidism (PHPT) currently ranks as one of the most prevalent endocrine disorders. It is classically defined by hypercalcemia accompanied by inappropriate levels of parathormone. The clinical presentation of PHPT has evolved since its initial description in the early twentieth century. Originally considered a rare and severe disease, it has transformed into a highly prevalent and less symptomatic condition[1].

This transformation is primarily attributed to the widespread adoption of routine serum calcium testing, especially in developed countries. Additionally, the aging global population has also contributed, as asymptomatic cases are more commonly observed in the elderly. Surgical intervention remains the curative and preferred treatment for symptomatic presentations. However, in cases with minimal symptoms or asymptomatic forms, the decision for surgery must carefully consider the benefit-to-risk ratio and the increased risk for failure[2].

In recent decades, significant progress has been achieved in various aspects of PHPT, encompassing genotypic/phenotypic correlations, as well as novel diagnostic and therapeutic approaches. Due to the unique characteristics associated with the epidemiology, diagnosis, and management of PHPT, multiple expert groups have developed guidelines. Notably, the 5th International Workshop[3], featuring researchers from different countries, was recently published and will serve as the foundation for our discussion.

The routine screening of osteoporotic patients includes the exclusion of PHPT, as one of its classical clinical manifestations adversely affects bone structure and quality, thereby increasing the risk of fractures. Conversely, secondary hyperparathyroidism is a prevalent condition often encountered during osteoporosis investigations, leading to confusion and misdiagnosis. These complexities require extensive discussions to avoid inappropriate approaches.

References:

1. Lazaretti-Castro M. The diagnosis of primary hyperparathyroidism in developing countries remains in the past century: still with bones, stone and groans. Arch Endocrinol Metab. 2020 Apr;64(2):101–102.
2. Iacobone M, Scerrino G, Palazzo FF. Parathyroid surgery: an evidence-based volume-outcomes analysis: European Society of Endocrine Surgeons (ESES) positional statement. Langenbecks Arch Surg. 2019 Dec;404(8):919–927.
3. Bilezikian JP, Khan AA, Silverberg SJ, Fuleihan GE, Marcocci C, Minisola S, Perrier N, Sitges-Serra A, Thakker RV, Guyatt G, Mannstadt M, Potts JT, Clarke BL, Brandi ML; International Workshop on Primary Hyperparathyroidism. Evaluation and Management of Primary Hyperparathyroidism: Summary Statement and Guidelines from the Fifth International Workshop. J Bone Miner Res. 2022 Nov;37(11):2293–2314.

MTE7
HOW CAN WE OPTIMIZE FRACTURE HEALING?

A. Kurth[1]

[1]Dep. of Orthopaedic and Trauma Surgery, Marienhaus Klinikum, Mainz, Germany

Osteoporosis drugs play a significant role in managing bone health and fracture healing in individuals with osteoporosis. Osteoporosis is a condition characterized by weakened bones, increasing the risk of fractures. Fracture healing can be compromised in individuals with osteoporosis due to poor bone quality and density. Here's how osteoporosis drugs may impact fracture healing:

Antiresorptive Drugs work by inhibiting bone resorption, thereby slowing down bone loss. Common antiresorptive drugs include bisphosphonates (such as alendronate, risedronate, zoledronate), selective estrogen receptor modulators (SERMs) like raloxifene, and denosumab (a monoclonal antibody targeting RANKL). While these medications can help prevent further bone loss and reduce fracture risk in osteoporosis patients, they may also affect bone remodeling during fracture healing. Some studies suggest that long-term use of bisphosphonates, for example, might delay fracture healing due to their suppressive effect on bone turnover. However, the clinical significance of this delay in healing remains a topic of debate.

Anabolic agents such as teriparatide and abaloparatide work by stimulating bone formation, thereby increasing bone density and strength. These drugs are often used in individuals with severe osteoporosis or those who have experienced fractures despite treatment with antiresorptive medications. Anabolic agents may have a

positive impact on fracture healing by promoting bone formation and remodeling, potentially accelerating the healing process. Preclinically, Scl-Ab (Romosozumab) rich osteogenic effects and has shown positive effects on bone healing in rodent models. However, two clinical have and failed to show positive effects in the femur and tibia.

Some treatment approaches involve combining antiresorptive and anabolic drugs to maximize bone density and strength while minimizing the risk of fractures. This combination therapy may offer benefits in both preventing fractures and supporting fracture healing, though more research is needed to fully understand its effects.

The timing of osteoporosis drug initiation in relation to fracture occurrence may influence fracture healing. Initiating treatment promptly after a fracture occurs may help optimize bone healing and reduce the risk of future fractures.

The impact of osteoporosis drugs on fracture healing may vary depending on individual factors such as age, overall health, severity of osteoporosis, and the specific characteristics of the fracture. Healthcare providers must consider these factors when determining the most appropriate treatment approach for each patient.

In summary, while osteoporosis drugs play a crucial role in managing bone health and reducing fracture risk, their effects on fracture healing can be complex and may vary depending on the specific medication, timing of treatment, and individual patient factors.

MTE8
CRITICAL ROLE OF EXERCISE IN POST FRACTURE MANAGEMENT

O. Bruyère[1], D. Pinto[2]

[1]WHO Collaborating Center for Public Health aspects of musculoskeletal health and ageing, Division of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium,
[2]Department of Physical Therapy, Marquette University, Milwaukee, United States

Fractures are a significant health problem, often requiring comprehensive management strategies to ensure optimal recovery and long-term outcomes. This presentation will examine the central role of exercise in post-fracture management, highlighting its multiple benefits in enhancing rehabilitation and preventing complications. The presentation will begin with an exploration of the physiological effects of fractures on the musculoskeletal system, highlighting the potential for muscle wasting, joint stiffness and overall functional decline. The importance of early mobilisation and the incorporation of targeted exercise programmes in mitigating these adverse effects will be highlighted. A detailed review of evidence-based exercise interventions tailored to specific fracture types will follow. From weight-bearing exercises for lower extremity fractures to range-of-motion exercises for upper extremity injuries, the lecture will provide practical insights into designing rehabilitation programmes that optimise healing and restore function. In the broader context of global rehabilitation, the session will extend its focus beyond exercise to include physiotherapy, nutrition and education. Participants will gain a comprehensive understanding of how the synergy between these elements contributes to a holistic and effective approach to post-fracture care. The integration of technology and innovative approaches will also be explored, providing healthcare professionals with actionable insights to optimise patient outcomes in the evolving landscape of post-fracture rehabilitation.

MTE9
TRANSGENDER MEDICINE: KEY CHALLENGES IN THE MANAGEMENT OF MUSCULOSKELETAL DISEASE

J.-M. Kaufman[1]

[1]Department of Endocrinology, Ghent University Hospital, Ghent, Belgium

Transgender or trans persons are people with experienced gender identity not aligned with their assigned sex at birth: trans men are assigned female at birth but self-identify as male; trans women are assigned male at birth but identify as female; non-binary trans persons identify as neither exclusively male or female. In addition to social transition, trans persons may seek gender-affirming medical care, i.e. hormonal treatment and/or surgery inducing and maintaining body changes more congruent to the self-identified gender. Gender-affirming hormonal treatment (GAHT) in trans men consist of testosterone treatment; GAHT in trans women consist of a testosterone-lowering drug [GnRH analogue (GnRHa), cyproterone acetate or spironolactone] and estradiol. Hormonal treatment of transgender adolescents consists of suppression of pubertal development with a GnRHa followed, if gender dysphoria persists, by GAHT usually from around age 16y. Hormonal treatment in non-binary trans people, who represent a substantial proportion (up to 20%) of trans persons, tend to be tailored to the individual needs of the trans person (e.g. partial masculinisation, partial feminisation) using various non-standardized treatment regimens. Considering the major role of sex steroid hormones in the regulation of both body composition and bone homeostasis, the potential musculoskeletal impact of GAHT deserves attention.

Trans women before initiation of any treatment have a lower lean mass, muscle area and strength, and lower areal (DXA) and volumetric (peripheral QCT) bone mineral density (BMD), a smaller cortical bone size and a higher prevalence of low BMD and osteoporosis compared to healthy cis men. This deficit has been attributed to lifestyle-related factors, particularly a low level of physical activity. During long-term GAHT, there is further modest decrease of muscular mass and physical performance towards values comparable to those in cis women, while pretreatment BMD is well maintained or slightly increased. Fracture risk in trans women $\geq$ 50 y is greater than in cis men and like that in cis women. In treatment naïve trans men muscle mass and strength tend to be slightly greater and BMD is not different compared to cis women. Muscle mass and strength increase, and BMD is maintained, while cortical bone size might slightly increase during long-term GAHT with testosterone. Adolescent trans girls but not trans boys have a lower lean body mass before initiation of treatment, which increases upon GHAT in trans boys and changes only modestly in trans girls. Pretreatment BMD is decreased in trans girls but not in trans boys. GnRHa monotherapy impairs physiologic pubertal BMD increase, resulting in decrease of BMD Z-scores both in trans girls and boys. Upon initiation of GAHT BMD and Z-scores increase with at least partial recovery. Nevertheless, there is a high prevalence of low BMD in young adult trans girls. There is no reliable data on the musculoskeletal effects of individualized, non-standardized GAHT applied in non-binary trans people.

In conclusion, GAHD in adult trans persons according to current guidelines has no detrimental musculoskeletal effects, whereas there is still a knowledge gap as to the longer-term effects on bone health in adolescents. Bone health deserves attention in adult and adolescent trans women because of increased risk of low BMD and osteoporosis. In addition to the general bone health-promoting measures such as adequate intake of calcium and vitamin D, adequate physical activity, avoidance of alcohol and smoking, strategies to optimize bone health include monitoring of adequacy of sex steroid exposure and patient compliance for GAHT. Systematic DXA screening is not advised, but in presence of risk factors for osteoporosis the threshold to perform

DXA should be low, in particular in trans women. Moreover, close monitoring is advisable for non-binary trans persons on individualized GHAT schemes often involving steroid hormone dosages suboptimal for maintenance of musculoskeletal health. Treatment decisions for trans persons with high fracture risk scan be based on the guidelines for osteoporosis in the general population.

MTE10
ACHIEVING OPTIMAL MUSCULOSKELETAL HEALTH IN HIV

E. Biver[1]

[1]Service of Bone Diseases, Geneva University Hospitals and Faculty of Medicine, Geneva, Switzerland

Life expectancy of people living with HIV (PLWH) is now close to that of the HIV-uninfected population. As a result, age-related musculoskeletal conditions, including osteoporosis and sarcopenia, are increasing in PLWH. However, most studies investigating musculoskeletal health in PLWH were performed before the latest developments in antiretroviral therapies (ART). Osteoporosis in PLWH is mainly driven by a combination of classical risk factors of bone fragility, very widespread in this population, and risk factors specific to HIV. Most of bone loss occurs during virus replication and during immune reconstitution at ART initiation, which both increase osteoclast activity. Abnormalities in bone formation and mineralization have also been shown in histomorphometric studies in untreated PLWH. The risk of fracture is higher in PLWH and increases about 10 years earlier compared to the general population. Measurement of bone mineral density (BMD) is the first line tool for assessing fracture risk in postmenopausal women, men above 50 years, and other PLWH with clinical risk factors for osteoporosis. FRAX underestimates fracture probability in PLWH. General preventive measures to optimize musculoskeletal health include the promotion of physical activity, a balanced diet, the cessation of toxic habits when applicable, and the prevention of obesity and falls in elderly PLWH. Calcium and vitamin D supplementation should be considered as ART initiation, since it may attenuate bone loss at this stage. In case of indication for anti-osteoporotic drug, bisphosphonates remain the reference option. Bone-protective ART regimens improve BMD to a lesser extent than bisphosphonate, and increase body weight compared to other regimens, and without available data on their influence on the incidence of fracture.

MTE11
DENOSUMAB CESSATION: A PRACTICAL APPROACH IN LONG-TERM TREATMENT

E. M. Curtis[1]

[1]MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom

Denosumab is a well-established treatment for osteoporosis with excellent efficacy and safety data to ten years follow-up. It is prescribed in a variety of situations, from first line anti-osteoporosis treatment to a follow-on from other antiresorptives or from anabolic therapy. However, studies have suggested that, in some patients, stopping denosumab therapy is associated with an increased risk of vertebral fractures without offering an alternative treatment.

In this session, we will discuss the choice of patients in whom denosumab treatment is most appropriate, together with duration of treatment, benefit/risk balance, and considerations around transition to anabolic treatments or bisphosphonates. The attendee will gain a better understanding of the position of denosumab in the context of long-term anti-osteoporosis treatment.

MTE12
QUALITY OF LIFE ASSESSMENT IN SARCOPENIA-LESSONS FOR COHORT AND CLINIC

C. Beaudart[1,2]

[1]Department of Biomedical Sciences, Clinical Pharmacology and Toxicology Research Unit, Namur Research Institute for Life Sciences (NARILIS), Faculty of Medicine, University of Namur, Namur, Belgium, [2]WHO Collaborating Center for Public Health aspects of musculo-skeletal health and ageing, Division of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium

As global life expectancy continues to rise, sarcopenia presents itself as a significant public health challenge. The various consequences of sarcopenia, ranging from the development of physical disability to nursing home admission, depression, hospitalisation, and even mortality, are anticipated to significantly impact the health-related quality of life (HRQoL).

In response to this, health services have redirected their focus toward improving patient's HRQoL, and the heightened attention given to patients participating in research studies has led to many initiatives shifting towards patient-centred research. In the realm of interventional clinical studies targeting sarcopenia, it becomes imperative to holistically assess the impact of interventions on patients' HRQoL. Patient-Reported Outcome Measures (PROMs) emerge as invaluable tools for capturing patients' perspectives on their health and experiences. Government regulatory agencies, including the Food and Drug Administration (FDA) and the European Medicines Agency (EMA), have advocated for the incorporation of Patient-Reported Outcomes Measurements as primary or secondary outcomes in interventional studies.

In the field of sarcopenia, on specific PROM for measuring HRQoL has been developed in 2015 by Beaudart et al. The SarQoL questionnaire can be found at http://www.sarqol.org, and stands as the only validated, sarcopenia-specific HRQoL instrument in the scien tific literature. In December 2023, an individual patient-data meta-analysis including all observational studies using SarQoL to assess quality of life in sarcopenia has been published. This analysis, encompassing 32 studies (including 10 unpublished data studies), revealed a substantial decrease in HRQoL among sarcopenic indi viduals compared to their non-sarcopenic counterparts (Mean Difference = − 12.32; 95% CI = [− 15.27; − 9.37]). However, sig nificant heterogeneity was observed, prompting subgroup analyses that highlighted the impact of regional differences, clinical settings, and diagnostic criteria on the observed variations. The moderate level of evidence, as assessed by GRADE, underscores the importance of recognizing these nuanced factors when interpreting the relationship between sarcopenia and HRQoL measured by the SarQoL questionnaire.

This meta-analysis provides valuable insights into the specific domains of HRQoL affected by sarcopenia and reinforces the significance of employing condition-specific instruments for a more accurate assessment of patient experiences. This IPD-meta-analysis also provides important HRQoL measurement values that can be used as endpoints in clinical studies. Using PROMs in interventional clinical studies on sarcopenia would contribute to a more comprehensive understanding of clinically perceived benefits, fostering an assessment of treatment efficacy.

MTE13
PHOSPHATE WASTING FOR THE OSTEOPOROSIS DOCTOR

J. Bubbear[1]

[1]Royal National Orthopaedic Hospital, Stanmore, United Kingdom

Phosphate wasting disorders are uncommon, but may present in the osteoporosis clinic with low bone density, fractures and/or pain. Blood phosphate levels are influenced by intestinal absorption, renal reabsorption and excretion as well as distribution between intracellular spaces, extracellular phosphate and the storage pool of phosphate in bone. Causes of a low phosphate are broad and include both genetic causes, which can present late in life, and acquired causes. Rare genetic causes include X-linked hypophosphataemia and Hereditary hypophosphataemia with hypercalcuria. There is a wide range of acquired causes that will be discussed including hyperparathyroidism, medications and more rarely Tumour induced osteomalacia. It is important to have a structured approach to assessment of a low serum phosphate to identify the cause and instigate appropriate treatments. This can reduce the time to diagnosis for rarer causes of a low phosphate and ensure that treatment is appropriate.

Learning objectives of this interactive workshop are:

- To understand phosphate metabolism.
- To have a structured approach to investigating for underlying causes of a low serum phosphate.
- To be aware of treatment options for a low serum phosphate including the use of Burosumab in X-linked hypophosphataemia and some cases of Tumour-induced osteomalacia.

MTE14
MANAGEMENT OF GIOP (GLUCOCORTICOID-INDUCED OSTEOPOROSIS) IN LATIN AMERICA

O. D. Messina[1]

[1]IRO Medical Research Centre, Collaborating Centre WHO, Buenos Aires, Argentina.

Guidelines and recommendations developed and endorsed by International Osteoporosis foundation (IOF) are intended to provide guidance for particular pattern of practice for physicians who usually prescribe glucocorticoid (GC) therapy and not to dictate the care of a particular patient and are intended to promote a desirable outcome but cannot guarantee any specific outcome. In 2022 a panel of Latin American (LATAM) experts specialized in osteoporosis with recognized clinical experience in managing GIO patients and authors of several publications in this field met to produce evidence—based LATAM recommendations for the diagnosis and management of GIO. These guidelines are particularly intended to general practitioners and primary care physicians who prescribe GC in LATAM countries. These recommendations were based on systematic literature review using MEDLINE, EMBASE, SCOPUS and COCHRANE Library Database during the period from 2012 to 2021. Based in this methodology fifty statements was made according to Oxford Centre for the Evidence—Based Medicine (EBM) criteria. Among five GIO guidelines and Consensus initially identified, two of them (American College of Rheumatology 2017) and the Brazilian guidelines (2021) were selected for comparison considering the latter as the most current guidelines in LATAM region. Based on his methodology fifty statements were issued.(1, 2, 3)

Algorithm of diagnosis and management of GIO is depicted in Fig. 1.

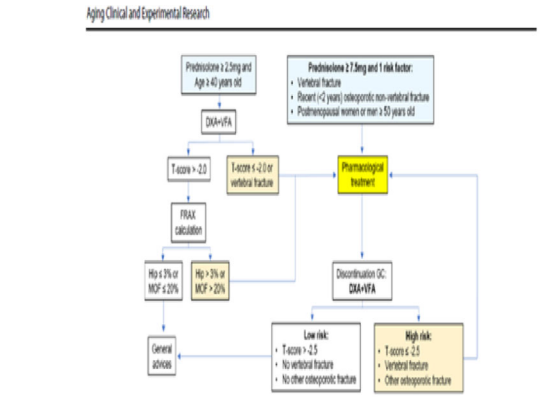


Fig. 1 Algorithm of diagnosis and management of glucocorticoid-induced osteoporosis. For women age 70 years and above, the intervention threshold set by NOGG is a MOF 10-year probability of 20% (or hip fracture probability of 4.8%) Assessment thresholds between which a BMD test would be undertaken to refine the probability assessment lie between 11 and 24%. Figure adapted from original article of Messina et al. [22]

- Table 1 depicts a comparison between ACR 2017 and Brazilian Guidelines 2021.

	ACR Guide 2017	Brazilian Guide 2020
Who should start prevention/treatment of GIOP?	All adults taking prednisone ≥ 2.5 mg/day for ≥3 months	All adults taking prednisone ≥ 5 mg/day for ≥3 months
Lifestyle changes for prevention/treatment of GIOP?	Smoking cessation; adequate diet; limit alcohol intake; weight bearing exercise	Smoking cessation; limit alcohol intake; avoid low body weight and sedentarism
Calcium/Vitamin D intake optimized to:	1000 to 1200mg/600 to 800IU per day. Reach serum 25OHD of 20 ng/mL	1000mg/500IU per day
Perform risk evaluation	Within 6 months of starting GC	Within 3 months of starting GC
BMD test to whom?	Adults < 40 years with a history of fragility fracture or severe risk factors All adults > 40 years	All the patients
Fracture risk stratification		
FRAX to evaluate fracture risk (**Adults ≥ 40 years**)	FRAX with GC dose adjustment	Brazilian FRAX model
High fracture risk	Prior fragility fracture T-Score ≤ -2.5 10-year risk of MOF ≥ 20% or ≥ 3%	Not available
Moderate fracture risk	10-year risk of MOF 10-19 % or >1% and <3%	Not available
Low fracture risk	10-year risk of MOF <10% or ≤1%	Not available
Adults < 40 years		
High fracture risk	Prior fragility fracture	Not available
Moderate fracture risk	Hip or spine Z-Score <-3, or Rapid bone loss (≥ 10% in 1 year) or continuing GC ≥ 7.5mg/day	Not available
Low fracture risk	None of the above risk factors	Not available
BMD threshold to prevent or treat men on GC	Not available	Prevention: T-Score ≤ 1 Treatment: T-Score ≤ 1.89
Vertebral fracture detection	Clinical assessment	X-Ray or DXA vertebral fracture assessment
Recommendations for special populations		
Children	Included	Included
Women of childbearing potential	Included	Included
People with organ transplant	Included	Not included
Patients on inhaled GC	Not included	Included
Patients on IV pulse GC	Not included	Included
Preferred initial pharmacological intervention for patients with moderate/high fracture risk	Oral bisphosphonates	Not stated
IV-Bisphosphonates; teriparatide; denosumab	Recommended for prevention and treatment	Recommended for prevention and treatment
Duration of pharmacological intervention	Discussed	Discussed
Definition of treatment failure	Discussed	Not discussed

GC= Glucocorticoid; BMD= Bone mineral density; 25OHD: 25-hydroxyvitamin D; MOF=

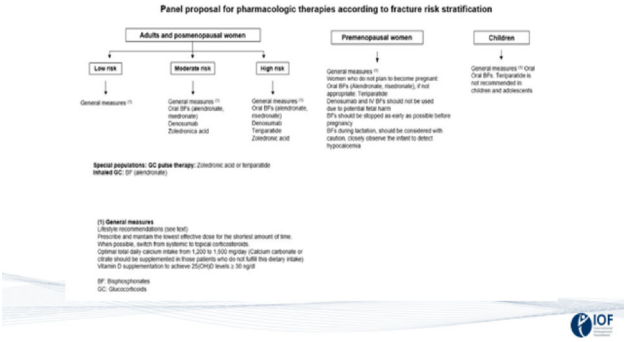
- Table 2 show a risk stratification of fractures in adults receiving GC therapy from ACR

Table 2 Risk stratification of fractures in adults receiving GC therapy from ACR guidelines

Fracture risk	High	Moderate	Low
Adults <40 years	History of osteoporotic fracture(s)	Hip or spine Z score <-3 or Rapid bone loss of ≥10% (at the hip or spine) over 1 year and Continuing GC treatment of ≥7.5 mg/day for ≥6 months	None of the above risk factors other than GC treatment
Adults ≥40 years	History of osteoporotic fracture(s) Hip or spine T-score ≤ -2.5 in men age ≥50 years and postmenopausal women FRAX® (GC adjusted) 10-year risk of major osteoporotic fracture ≥20% FRAX® (GC adjusted) 10-year risk of hip fracture ≥3%	FRAX® (GC adjusted) 10-year risk of major osteoporotic fracture 10 - 19% FRAX® (GC adjusted) 10-year risk of hip fracture >1% and < 3%	FRAX® (GC adjusted) 10-year risk of major osteoporotic fracture <10% FRAX® (GC adjusted) 10-year risk of hip fracture ≤1%

Table adapted from Buckley L et al. [6]

- Fig. 2 show the LATAM GIO panel proposal for pharmacological therapies according to fracture risk stratification



References

1. Buckley L, Guyatt G, Fink HA et al. (2017) American College of Rheumatology guideline for the prevention and treatment of glucocorticoid-induced osteoporosis. Artrhitis Care Res (Hoboken) 69:1095–1110.
2. Pereira RM, Perez MO, Paula AP et al. (2021) Guidelines for the prevention and treatment of glucocorticoid-induced osteoporosis: an update of Brazilian society of rheumatology (2020) Arch Osteoporosis 16:1–16.
3. Messina OD, Vidal M, Morales-Torres JA, Vidal LF, Arguissain CB, Pereira RM, Clark P et al. Evidence based Latin American Guidelines of clinical practice on prevention, diagnosis, management and treatment of glucocorticoid-induced osteoporosis. A 2022 update (manuscript has been produced under the auspices of the Committee of National Societies (CNS) and the Committee of Scientific Advisors (CSA) of the International Osteoporosis Foundation (IOF). Aging Clin Exp Res (2022) 34:2591–2602.

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): Committee of Scientific Advisory Board Abstracts

CSA-OC1
OPTIMISATION OF HIP FRACTURE SERVICES: LESSONS FROM THE REDUCE STUDY

C. Gregson[1]

[1]University of Bristol, Bristol, United Kingdom

Substantial variations remain in the delivery of hip fracture care across the United Kingdom despite well-established standards and guidelines. We aimed to predict adverse patient outcomes following hip fracture from modifiable hospital-level organisational factors and use findings to develop implementation tools to improve national hip fracture service delivery.

We used a national record-linkage cohort of 178,757 patients (age $\geq$ 60 years) with a hip fracture in England and Wales (2016–19). We linked patient-level hospital admissions, National Hip Fracture Database and mortality data with 231 metrics from 18 hospital-level organisational-level audits and reports. Multilevel models identified organisational factors, independent of patient case-mix, associated with patient outcomes: length of hospital stay, emergency 30-day readmission, 120-day mobility recovery, days in hospital and health costs over 365-days, and mortality (30- and 365-day) in 172 hospitals across England and Wales.

Over one-year patients with mean (SD) age 83 (8.6) years, spent 31.7 (32.1) days in hospital, costing £14,642 (£9,017), and 50,354 (28.2%) died. We identified 46 key organisational factors independently associated with one or more patient outcome, of which 13 were (a) associated with cost and/or bed-day savings over one year, (b) consistently associated with other positive patient outcomes, and (c) potentially modifiable. Factors included weekend physiotherapy provision (mean saving per patient/year: £676 [95% CI £67–1285]), orthogeriatrician assessment (£529 [£148–910]), direct admission to a hip fracture ward (3.4 [− 0.36 to 7.07] days), regular dissemination of audit data to staff (0.85 [0.30–1.39] days). These data have informed the development of a hospital-specific cost–benefit calculator, with model business cases for service improvement, specialty checklists, audit and 'how to' guides for complex care delivery.

All hospitals should try to provide the best available hip fracture care equally across the country. We identified multiple, potentially modifiable, organisational factors associated with important patient outcomes following hip fracture. Our practical and freely-available toolkit should help reduce variation in service delivery.

CSA-OC2
BONE MARROW ADIPOSITY: NEW UNDERSTANDING IN OSTEOPOROSIS PATHOGENESIS

J. Paccou[1]

[1]Department of Rheumatology, Lille University Hospital, Lille, France

Purposeofpresentation: This presentation focuses on the recent findings regarding bone marrow adipose tissue (BMAT) concerning bone health. We summarize the variations in BMAT in relation to age, sex, and skeletal sites, and provide an update on noninvasive imaging techniques to quantify human BMAT. Next, we discuss the role of BMAT in patients with osteoporosis and interventions that affect BMAT.

Recentfindings: There are wide individual variations with region-specific fluctuation and age- and gender-specific differences in BMAT content and composition. The Bone Marrow Adiposity Society (BMAS) recommendations aim to standardize imaging protocols to increase comparability across studies and sites. Water-fat imaging (WFI) seems an accurate and efficient alternative for spectroscopy (1H-MRS). Most studies indicate that greater BMAT is associated with lower bone mineral density (BMD) and a higher prevalence of vertebral fractures. The proton density fat fraction (PDFF) and changes in lipid composition have been associated with an increased risk of fractures independently of BMD. Therefore, PDFF and lipid composition could potentially be future imaging biomarkers for assessing fracture risk. Evidence of the inhibitory effect of osteoporosis treatments on BMAT is still limited to a few randomized controlled trials. Moreover, results from the FRAME biopsy substudy highlight contradictory findings on the effect of the sclerostin antibody romosozumab on BMAT.

Summary: Further understanding of the role(s) of BMAT will provide insight into the pathogenesis of osteoporosis and may lead to targeted preventive and therapeutic strategies.

CSA-OC3
STATE-OF-THE-ART IN HYPOPHOSPHATASIA: RECENT RECOMMENDATIONS FROM INTERNATIONAL WORKING GROUPS

M. L. Brandi[1,2]

[1]Fondazione FIRMO and Observatory for Fragility Fractures, Florence, Italy, [2]University San Raffaele, Milano, Italy

Hypophosphatasia (HPP) is an inborn error of metabolism caused by reduced or absent activity of the tissue non-specific alkaline phosphatase (TNSALP) enzyme, resulting from pathogenic variants in the ALPL gene. Clinical presentation of HPP is highly variable, including lethal and severe forms in neonates and infants, a benign perinatal form, mild forms manifesting in adulthood, and odonto-HPP. Diagnosis of HPP remains a challenge in adults, as signs and symptoms may be mild and non-specific. Disease presentation varies widely; there are no universal signs or symptoms, and the disease often remains underdiagnosed or misdiagnosed, particularly by clinicians who are not familiar with this rare disorder. The absence of diagnosis or a delayed diagnosis may prevent optimal management for patients with this condition.

The diagnosis of hypophosphatasia (HPP) is made on the basis of integrating clinical features, laboratory profile, radiographic features of the condition, and DNA analysis identifying the presence of a pathogenic variant of the tissue nonspecific alkaline phosphatase gene (ALPL). Often, the diagnosis of HPP is significantly delayed in both adults and children, and updated diagnostic criteria are required to keep pace with our evolving understanding regarding the relationship between ALPL genotype and associated HPP clinical features.

No formal diagnostic guidelines currently existed before for the diagnosis of this condition in children, adolescents, or adults. The International HPP Working Group is a comprised of a multidisciplinary team of experts from Europe and North America who have expertise in the diagnosis and management of patients with HPP.

Following consensus meetings, agreement was reached regarding the major and minor criteria that can assist in establishing a clinical diagnosis of HPP in adults and children.

These results will be presented and discussed at the WCO meeting.

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): Committee of National Societies Abstracts

OCs1
- P175 VARIATIONS IN HOSPITAL LENGTH OF STAY AND PERFORMED SURGICAL PROCEDURES AFTER HIP FRACTURES

A. Gasparik[1], L. Lorenzovici[1], M. Cevei[2], D. M. Farcas[2], D. Stoicanescu[3]

[1]Univ. of Medicine and Pharmacy of Tg Mures (UMFST), Tirgu Mures, [2]Universitatea Oradea, Oradea, [3]Univ. of Medicine V Babes Timisoara, Timisoara, Romania

Objective: The number of days spent in hospital (LoS) for osteoporosis and consequent fractures is higher than for myocardial infarction, stroke, breast cancer and chronic obstructive pulmonary disease. While most hip fractures are treated surgically, the LoS as well as the procedures performed to repair the fracture vary widely depending on many factors. Our aim was to define the patient and hospital characteristics that impacts these output variables.
Methods: We performed a retrospective study including 5993 inpatients registered during the years of 2018–2019 in 7 Romanian counties, with femoral neck, pertrochanteric, and subtrochanteric fractures. The following variables were registered: demographic characteristics of the patients, diagnosis code, duration of hospital stay, therapeutic procedure, hospital category (clinical, county, municipal), county where the surgery was performed, and in-hospital death.
Results: Regression analysis was used to examine variations in duration of care, procedures performed and death while controlling for patients' gender, setting (urban/rural), diagnosis, hospital category and region. Average age was 77.2 y (86% 65 +), mean length of hospital stay was 13.3 d (varied between 9.6-Vaslui and 14.6-Arad county). Urban residents and men spent significantly more days in the hospital (p .000 and .019). LoS was significantly longer also among older patients, in subtrochanteric fractures and *county* hospitals. The other analyzed dependent: the surgical procedure significantly correlated (when controlled for diagnosis 72.0, 72.1, 72.2 codes) with the following variables: urban vs. rural setting, diagnosis, type of hospital, age, length of care and in-stay death. Some of the variations observed are consistent with the international epidemiological data. Urbanity/rurality and gender dependence is noted in the literature for fracture incidence, LoS and mortality, however, no data was found for procedure choices based on patient gender and setting. The seemingly unexplainable variations raise the question of possible arbitrary (subjective/preferential) and professionally unjustifiable health technology choices.
Conclusion: Our study revealed that Los is significantly higher among men, urban residents and when hospitalized in a county unit. High variations are observed among fixation procedures depending on gender, setting, and hospital category. Exploring these complex patterns, the causes of the variations, solutions might be identified for optimal medical choices, reduction of prolonged care and a better resource allocation.

OCs2
- P317 LESSONS FROM RICO: RISK COMMUNICATION IN OSTEOPOROSIS STUDY

C. Beaudart[1], M. Sharma[2], S. Silverman[3], M. Hiligsmann[4]

[1]Clinical Pharmacology and Toxicology Research Unit (URPC), NARILIS, Dept. of Biomedical Sciences, Faculty of Medicine, Univ. of Namur, Namur, Belgium, [2]The OMC Research Center, Beverly Hills, USA, [3]Cedars-Sinai Medical Center, UCLA, Los Angeles, USA, [4]Dept. of Health Services Research, Care and Public Health Research Institute (CAPHRI), Maastricht Univ., Maastricht, Netherlands

Objective: There is a close and strong relationship between the quality of fracture risk communication and the initiation of osteoporosis treatment and adherence. RICO was a global study, run in 2022, involving 332 participants at risk of fracture aiming to improve fracture risk communication and to understand patients' willingness to initiate treatment based on their perception of fracture risk.
Methods: Semi-structured interviews were conducted in 11 centres, 9 countries around the world (UK, Belgium, the Netherlands, Spain, Japan, Canada—Hamilton and Montreal, Argentina, Mexico, USA—Los Angeles and Spokane). The participants' Fracture Risk Decision Point (FRDP) was established as the fracture risk at which a participant was willing to initiate therapy. For that, participants were shown 8 distinct scenarios—each with a hypothetical FRAX score and a standard 40% fracture risk reduction upon use of a medication with minor, transient side effects. In each scenario, participants were asked whether they would hypothetically agree to initiate the medication.
Results: The major finding of RICO study was that participants expressed a strong willingness to receive communication about their fracture risk. Globally, they preferred visual to numeric presentations of FRAX data. Among the format presented, colored stoplight was preferred to icon array. Median FRDP was below the national treatment threshold in all eight countries which use FRAX®-based treatment thresholds in a clinical setting. Moreover, 75.7% of all participants demonstrated FRDP below their respective treatment threshold. Patients who demonstrated higher levels of numeric literacy also showed a significantly higher median FRDP (i.e. 10%) compared to those with a lower level of numeric literacy (i.e. FRDP of 5%, $p < 0.001$). FRDP was not influenced by age or history of fracture. Among participants who agreed to initiate medication with an hypothetical 40% of fracture risk or less, a weak and negative correlation was found between FRDP and age ($r = -0.153$, $p = 0.007$).
Conclusion: Fracture risk communication with FRAX may be improved with visual presentation and use of both 2- and 10-year time frame. The RICO team is currently developing a fracture risk communication tool.

OCs3
- P498 FROM PIXELS TO PREVENTION: AI-POWERED DIGITAL RADIOGRAMMETRY DEMOCRATIZES OSTEOPOROSIS DIAGNOSIS.

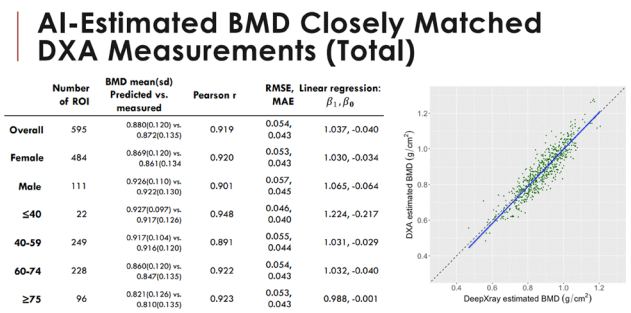
F. Shau-Huai[1], L. Cheng Wei[2], L. Chia-Hung[2], J. Yu-Ming[2], T. Qingzong[2], L. Yen-Jun[3]

[1]Dept. of Orthopedics, National Taiwan Univ. Hospital Yun-Lin Branch, Douliu, [2]Alpha Intelligence Manifolds, Taipei, [3]Radiology Dept., Far-Eastern Memorial Hospital, New Taipei City, Taiwan

Objective: BMD, assessed through DXA, is the gold standard for diagnosing osteoporosis. However, the availability of DXA remains a challenge, especially in rural areas. This study investigates the estimation of BMD from standard pelvic radiographs as an alternative.
Methods: The study employed deidentified data from Far Eastern Memorial Hospital and three primary care clinics in Taiwan, including 2235 patients with 2321 paired pelvic radiograph-DXA samples. The BMD values obtained from standard DXA scan within ± 6 months of the Xray imaging time were used as the ground truth value for AI model training. A hip landmark model was developed to extract radiogrammetric parameters, such as Cortical

Thickness Index and Femoral Neck Width. Test-time intensity augmentation and ablation studies were performed to assess feature contributions. An AI-augmented radiogrammetric BMD estimation model was developed based on the RegNet neural network architecture while incorporating radiogrammetric features. The model was trained with paired Xray-DXA data from 85% of the patients. The remaining 15% of patient data was reserved for model performance testing. Pearson correlation and RMSE between model-predicted and DXA-measured BMD were evaluated. Binary classification performance of the model for osteoporosis was also assessed.

Results: In the test set of 595 hip x-ray-DXA BMD pairs (81.3% female, mean age 61.4 y), the prevalence of osteoporosis was 24.7%. The Pearson correlation between predicted total hip BMD and measured BMD was 0.919. Subgroup analysis for female and male showed correlations of 0.920 and 0.901, respectively. Correlations remained strong across age groups. Predicted femoral neck BMD and measured BMD correlated at 0.868. Using a T-score ≤ -2.5 as the cutoff, the positive predictive value was 0.903, the negative predictive value was 0.907, and the ROC AUC was 0.950.



Conclusion: The AI model estimates BMD by radiogrammetry rather than absorptiometry, providing a robust and accurate BMD estimate that is highly correlated with DXA-measured BMD. This correlation allows rapid classification of osteoporosis according to established criteria. In addition, the implementation of an opportunistic screening strategy can expand diagnostic coverage, particularly benefiting rural areas.

OCs4
- P660 VERTEBRAL FRACTURES BY DXA: IS THE CURRENT DEFINITION ADEQUATE?

J. L. A. Morales Torres[1], J. Romero Ibarra[1], J. Morales Vargas[2]

[1]Hospital Aranda de la Parra, [2]Morales Vargas Centro de Investigacion, Leon, Mexico

Objective: Osteoporotic vertebral fractures (VF) indicate reduced bone strength and predict new fractures. Their identification in patients with suspected osteoporosis (OP) by DXA-based Vertebral Fracture Assessment (VFA) improves current definition of OP[1]. We aimed to describe the frequency of VF in patients referred to an osteodensitometry (ODM) center using the commonly accepted definition.

Methods: We included patients referred for an ODM study, who underwent a VFA as they met criteria for it[2]. VFA studies were performed on a GE-Lunar, iDXA device. We report the frequency of VF defined as a loss of vertebral body height of $\geq 20\%$ in one or more segments[1]. The characteristics of those with and without VF are compared by Student's t-test.

Results: We included 1226 patients (91.9% women) with a mean age of 74 ($\pm$ 8.5) y, seen since the end of 2021. Of these, 807 (65.8%) had at least one VF and 419 (34.2%) had none. Their characteristics are summarized in Table 1. Mean BMD is significantly lower in the VF population.

Table 1. Characteristics of the patients included

	No fracture (n=419)	With fracture (n=807)	P
Mean age	73.2 (±8.28)	74.82 (±8.71)	0.0017
Mean height	154.1(±10.41)	152.1(±8.39)	0.0003
Mean Weight	64.67(±13.56)	62.84(±11.91)	0.0136
Spine BMD (± SD)	1.028 (±0.207)	0.982 (±0.214)	0.0003
Spine BMD (± SD)	0.854 (±0.164)	0.777 (±0.152)	0.0001

Conclusion: Prevalence of VF in the community is 19.2 for women and 9.8 for men in Mexico[3]. Findings of this report exceed that. Population referred to ODM is more likely to have OP but, is the 20% limit adequate to define the presence of a fracture? Current paradigm prompts to consider all patients with a VF as having OP and requiring pharmacological therapy[1]. We found a high frequency of VF by VFA. According to the current definition, all such patients should be considered candidates for OP treatment.

References

1. Diacinti D, et al. Quant Imaging Med Surg 2019;9:1485
2. iscd.org/learn/official-positions/. Consulted 16 Oct, 2023
3. Clark P, et al. Rev Invest Clin 2013;65:183

OCs5
- P754 ANXIETY AND DEPRESSION ARE ASSOCIATED WITH POOR HEALTH BEHAVIOURS AND INCIDENT FRACTURE AMONG WOMEN: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY

L. D. Westbury[1], G. Bevilacqua[1], C. Cooper[1], E. M. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK

Objective: A recent systematic review has highlighted possible links between depression and fracture risk, but no information regarding possible explanatory health behaviours was available. In this study we used a well phenotyped community-dwelling cohort of older adults (the Hertfordshire Cohort Study) to consider these associations further.

Methods: Data from 2997 men and women, aged 59–73 y at baseline, were analysed. At baseline, mental health characteristics and health behaviours were ascertained through clinician-administered questionnaires. Anxiety and depression (mild or worse) were identified by scores of > 7 on the corresponding Hospital Anxiety and Depression Scale. Health behaviours included current smoking, alcohol consumption, diet quality and physical activity (Dallosso questionnaire). Incident fractures were identified using ICD-10 codes from Hospital Episode Statistics data, available from baseline (1998–2004) until December 2018. Health behaviours in relation to anxiety and depression were examined using logistic regression; anxiety and depression in relation to incident fracture were examined using Cox regression. All analyses were sex-stratified and adjusted for age; $p < 0.05$ was regarded as statistically significant.

Results: Prevalence of anxiety was 15% among men and 25% among women; prevalence of depression was 5% among men and 6% among women. Overall, 9% of men and 22% of women had a fracture during follow-up. Among men and women, poorer diet quality and lower physical activity were associated with depression; these health behaviours were also associated with anxiety among men. Current smoking was associated with anxiety and depression among women. Among women, anxiety (hazard ratio (95% CI): 1.34 (1.05, 1.72), $p = 0.019$) and depression (1.76 (1.18, 2.64), $p = 0.006$) were related to increased risk of incident fracture; among men, associations for

anxiety (p = 0.198) and depression (p = 0.265) in relation to fracture were weaker.

Conclusion: Anxiety and depression were associated with increased risk of incident fracture among women, possibly due to their association with poor health behaviours, which are established risk factors for fracture. Preventive strategies are required to address poor health behaviours and mental health among older adults.

OCs6
- P952 BONE MINERAL DENSITY AND HAND GRIP STRENGTH IN POSTMENOPAUSAL WOMEN WITH FOREARM FRACTURES

I. Stets[1], A. Iniushyna[1], D. Kurylo[1], A. Musiienko[1], N. Grygorieva[1]

[1]D. F. Chebotarev Institute of Gerontology, NAMS of Ukraine, Kyiv, Ukraine

Objective: Forearm fractures (FF) are one of the important osteoporotic fractures that increase the risk of other osteoporotic fractures in the future and lead to temporary or even permanent decrease in a patient's functional capabilities. The study aimed to assess BMD and hand grip strength in postmenopausal women depending on previous FF.

Methods: 150 postmenopausal women (average age 66.9 ± 8.5 y) were examined and divided into 2 groups. Group I consisted of 75 persons without any previous fractures and Group II included 75 females with previous FF (age at the time of the fracture 57.1 ± 10.1 y, duration of the period after a fracture—10.0 [2.0–16.0] y). BMD, T, and Z-scores of the lumbar spine, hip, femoral neck, and radius were measured using DXA (Hologic Discovery WI, USA, 2016). Muscle strength was assessed by handgrip strength of both hands using a spring hand dynamometer.

Results: The women of both groups did not differ significantly by age and height; however subjects with FF had a significantly lower body mass (67.4 ± 11.7 and 79.8 ± 14.9 kg, respectively), BMI (25.8 ± 4.0 and 30.1 ± 5.4 kg/m^2), age of menopause (48.1 ± 4.5 and 50.3 ± 3.4 years, for all parameters $p < 0.001$) and higher duration of postmenopausal period (19.2 ± 9.4 and 16.1 ± 8.5 y, $p < 0.05$). BMDs of the lumbar spine, hip, femoral neck, and radius of females with FF were significantly lower than the parameters of subjects without fractures.

Despite the absence of the BMD differences at broken and unbroken forearm (0.535 ± 0.089 and 0.538 ± 0.090 g/cm^2, respectively, 0.622 ± 0.060 g/cm^2 for Group I), significantly lower muscle strength was established at the side of broken forearm (16.0 [12.0–20.0] kg) compared to other hand (18.0 [15.0–23.0] kg, $p < 0.001$).

Conclusion: Women with previous FF had lower mass, BMI, and age of menopause and worse BMD parameters compared to females without previous fractures. Despite the absence of the BMD differences at the broken and unbroken forearm, hand grip strength was worse at the side of the broken forearm, which confirms the negative FF consequences for a long time after the fracture.

OCs7
- P1181 ORTHOGERIATRIC CO-MANAGEMENT FOR OLDER PATIENTS WITH A MAJOR OSTEOPOROTIC FRACTURE: AN OBSERVATIONAL PRE-POST STUDY

S. Janssens[1], A. Sermon[2], M. Deschodt[1], K. Fagard[1], M. Cerulus[3], H. Cosyns[3], J. Flamaing[1], M. Herteleer[2], M. Dejaeger[1]

[1]Dept. of Public Health and Primary Care, Division of Gerontology and Geriatrics, KU Leuven, [2]Dept. of Development and Regeneration, Division of Locomotor and Neurological Disorders, KU Leuven, [3]Dept. of Geriatric Medicine, Univ. Hospitals Leuven, Leuven, Belgium

Objective: To evaluate if nurse-led orthogeriatric co-management in patients with a major osteoporotic fracture results in better outcomes than inpatient geriatric consultation.

Methods: This single-center observational pre-post effectiveness study took place at the traumatology ward of the University Hospitals Leuven in Belgium. We evaluated 108 patients aged 75 y and older hospitalized with a major osteoporotic fracture in each cohort (usual care group with inpatient geriatric consultation vs. nurse-led orthogeriatric co-management). The intervention included proactive geriatric care, a patient's self-reported evaluation of premorbid status, a comprehensive geriatric evaluation followed by multidisciplinary interventions, and systematic follow-up. The primary outcome was the proportion of patients having one or more in-hospital complications. Additionally, a process evaluation of the intervention's core components and adherence to proactive geriatric care processes was performed.

Results: After controlling for confounding variables in a multivariable logistic regression model, the odds for any in-hospital complication in the intervention group decreased by 51% compared to the usual care group (OR = 0.49 (95% CI 0.26–0.92), p = 0.027). Delirium incidence decreased by 13% (34 vs. 21%; p = 0.003). Furthermore, the incidence of congestive heart failure and pneumonia decreased by 3% (p = 0.269) and 5% (p = 0.119), respectively. No differences were observed in the incidence of deep venous thrombosis, pulmonary embolism, myocardial infarction, urinary tract infection, and in-hospital mortality. Adherence to the intervention's core components was as follows: completion of a self-reported questionnaire to map premorbid status (38%), multidimensional evaluation (100%), development of an individual care plan (100%), and systematic follow-up (81%). Regarding the proactive geriatric care processes, screening for dysphagia and daily food intake were introduced in clinical practice (0% vs. 70%, 0% vs. 52%), more patients received a laxative if they did not pass stool (67 vs. 94%), and more patients received calcium-vitamin D supplements (20 vs. 58%), all significant with $p < 0.001$.

Conclusion: Implementation of nurse-led orthogeriatric co-management resulted in significantly higher fidelity to proactive geriatric care processes and in a significant reduction of in-hospital delirium incidence and an overall reduction in in-hospital complication rate.

OCs8
- P1355 UNITING THE DICHOTOMY BETWEEN PRIMARY AND SECONDARY PREVENTION OF OSTEOPOROSIS: A COMMUNITY-BASED INTERVENTION

Y. El Miedany[1], A. Gadallah[2], M. Sarhan[3], M. Elgaafary[2], A. Ahmed[3]

[1]Canterbury Christ Church Univ., Canterbury, UK, [2]Ain Shams Univ., Cairo, Egypt, [3]Egyptian Food Bank, Cairo, Egypt

Objective: Osteoporotic fractures, are associated with consequent negative impacts on health, quality of life, functional ability as well as independence. The overarching goal of treating osteoporotic patients is to reduce the incidence of fractures, yet interventions that support early detection of osteoporosis and prevention of osteoporotic fractures are underutilized. Recently, a groundbreaking collaboration between the WHO with ESCEO and the IOF for the prioritization of osteoporosis and fragility fracture prevention within global healthcare policy. In concordance with this new approach, this project has been launched to lay the groundwork for a national approach for prevention of osteoporosis and fragility fractures in Egypt. Aims: 1. to set up a national program implementing "Targeting to Treat" approach to

identify and treat subjects at high or very high risk of fragility fracture in care homes in Egypt. 2. To assess the applicability of using a comprehensive questionnaire for assessing the risk of fractures in older adults in the community. 3. To evaluate the evidence on interventions for preventing fracture in older adults.

Methods: This is a national quality improvement program adopting a Plan, Do, Study, Act (PDSA) cycle methodology. The project is a joint activity provided by the Egyptian Food bank and the Egyptian Academy of Bone and Muscle Health in collaboration with the ministry of Social Solidarity. All older adults living in care homes in Egypt, aged 50-years and above have been invited to join this project of primary prevention of osteoporosis. A list of eligible patients was generated through the national record. Every participant has been invited to complete a questionnaire to assess for Fracture risk, Falls risk, Sarcopenia Risk, functional disability, as well as comorbidities and current medications intake. US scan of the heals will be carried out for every enrolled person. Patients at high/very high fracture risk will be subjected to DXA scan. Rehabilitation program will be provided by local physio teams under supervision of the Rehab physicians to reduce sarcopenia and fall risk. Patient education and counselling program will be provided by the treating doctors. This work describes the protocol of the activity which has been set up in Cairo and Giza as an initial phase. Blood tests for Vitamin D serum levels and bone profile will be assessed for all subjects enrolled in this work. Supplement therapy will be provided for those participants wherever required.

Results: Reviewing the self-completed questionnaire will facilitate the recognition of subjects at high/very high fracture risk, high falls risk as well as sarcopenia risk. The patients will be stratified according to the underlying pathology and risk factors. Rehab program will be set up to tackle these risk factors. The Egyptian food bank will provide food and vitamin D supplement to the elder in need, identified based on their lab tests. Osteoporosis therapy will be offered according to national guidelines to the patients according to their fracture risk. Regular monitoring of the patients will be carried out to check for the progress of the falls and sarcopenia status as well as adherence to therapy.

Conclusion: This community intervention program of screening for osteoporosis, falls and sarcopenia along with continued medical care and patient education is expected to result in a significant improvement in the musculoskeletal healthcare in the care homes that we hope to expand to cover all the care homes at the national level. Providing comprehensive pharmacological as well as non-pharmacological management is expected to reduce the risk of developing fragility fractures.

OCs9
- P839 HAND GRIP STRENGTH IN PATIENTS WHO DIAGNOSED WITH TYPE 2 DIABETES MELLITUS IN MONGOLIAN FAMILY HEALTH CENTER

M. Jaalkhorol[1], E. Jamsranjav[1], E. Radnaa[2], B. Bat-Orgil[3], G. Ochirdorj[1], O. Bold[4]

[1]Univ. of National Medical Sciences, [2]Buyant Onoshilogoo Hospital, [3]Singapore School, [4]National Center for Communicable Diseases, Ulaanbaatar, Mongolia

Objective: Despite the many clinical studies in Mongolia, no study has measured the hand grip strength (HGS) of citizens diagnosed with diabetes mellitus. The present study aimed to measure the HGS of people diagnosed with type 2 diabetes mellitus (T2DM) at family health centers in Ulaanbaatar city.

Methods: The study was conducted using a cross-sectional survey and included 347 participants over age 40 who had T2DM in the family health center. Hand grip strength was measured using a digital dynamometer (TKK-5101; Takei Scientific Instruments, Tokyo, Japan). HGS was measured by a handheld dynamometer with maximum effort; two attempts were made with each hand. HGS was defined according to the Asian Working Group for Sarcopenia (AWGS) criteria as low handgrip strength (< 18 kg for females). Relationships between variables were assessed by Pearson's linear correlation coefficient.

Results: We recruited 347 participants whose mean age was 59.87 $\pm$ 8.93 y. 59.9% (n = 208) of the participants were women and 40.1% (n = 139) were men. 81.3% of the participants had hypertension, 42.1% had cardiovascular disease, 36.0% had ophthalmic disease, 28.2% had kidney disease, and 26.8% had rheumatoid arthritis. By age group, the grip strength of the right hand in men was the highest in the 40–49 age group (32.23 $\pm$ 9.33 kg), while in women the highest was in the 40–49 age group (20.66 $\pm$ 5.62 kg). The median male grip strength of the participants was 30.5 kg, with a minimum value of 9 kg and a maximum value of 53 kg, while the average left-hand grip strength was 28 kg, with a minimum value of 2.5 kg and a maximum value of 50 kg. Age and diabetic variables were significantly correlated with handgrip strength in male patients ($r = 0.237$, $p < 0.001$). A strong positive correlation was found in females between handgrip strength and pregnancy diabetes ($r = 0.865$, $p < 0.001$). Also type 2 diabetes duration, occurrence of leg ulcer and rheumatoid arthritis, and handgrip strength were significantly associated.

Conclusion: The average hand grip strength of both hands significantly differed between age groups, decreasing with age. There were significant sex differences in HGS within each age group, favoring men.

OCs10
- P506 MACHINE LEARNING TO CHARACTERIZE BONE BIOMARKERS PROFILE IN RHEUMATOID ARTHRITIS

G. Adami[1], D. Gatti[1], C. Benini[1], O. Viapiana[1], A. Fassio[1], M. Rossini[1]

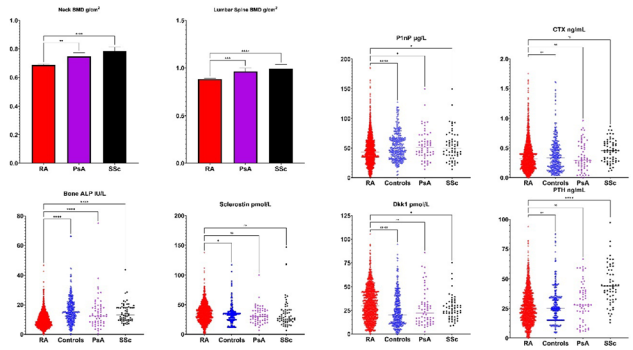
[1]Univesity of Verona, Rheumatology Unit, Verona, Italy

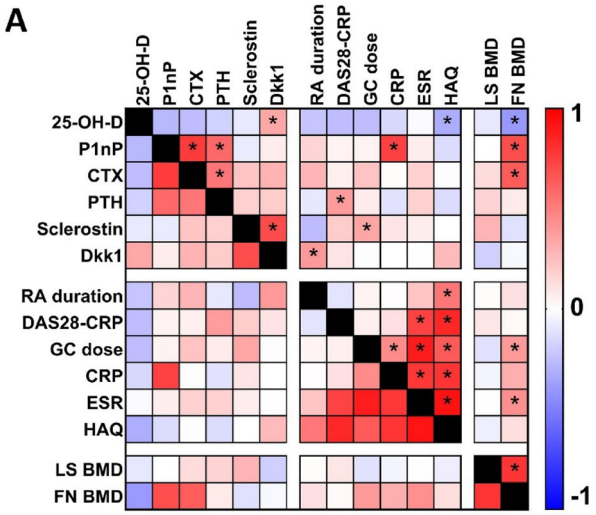
Objective: Bone metabolism is disrupted in rheumatoid arthritis (RA); however, the bone metabolic signature of RA is poorly known. The objective of the study is to further characterize the bone metabolic profile of RA and compare it to psoriatic arthritis (PsA), systemic sclerosis (SSc) and healthy controls.

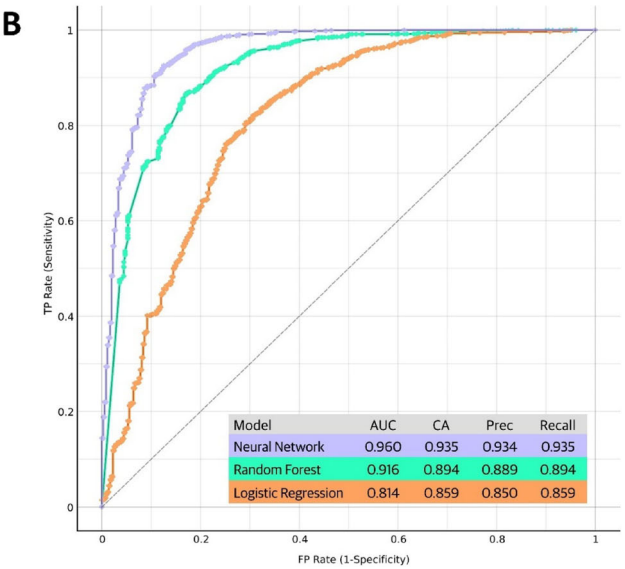
Methods: We did a cross-sectional case–control study on consecutively enrolled patients and age-matched controls. We collected clinical characteristics, serum biomarkers related to bone metabolism and BMD. A multiple correlation analysis using Spearman's rank correlation coefficient was conducted within the RA patient group to investigate associations between biomarker levels and clinical variables. Machine learning (ML) models and principal component analysis (PCA) was performed to evaluate the ability of bone biomarker profiles to differentiate RA patients from controls. We ran three different ML models (random forest, neural network, logistic regression) considering the following features in addition to all serum biomarkers tested: cumulative glucocorticoid intake, age, gender, CRP levels, csDMARD and b/tsDMARD use. To assess the performance of these machine learning models, we employed standard evaluation metrics, including classification accuracy (CA), precision, recall, and receiver operating characteristic (ROC) curves with area under the curve (AUC) analysis. We implemented cross-validation (10 folds, stratified) to ensure the robustness of our models and mitigate overfitting.

Results: A total of 1883 participants were included in the analysis, comprising 1462 RA patients, 60 PsA patients, 62 SSc patients, and 359 age-matched healthy controls. We found significantly lower

BMD in RA patients compared to PsA, and SSc groups. RA patients exhibited higher Dkk1, sclerostin and lower P1nP and B-ALP levels compared to controls. No significant differences in CTX levels were noted. Figure 1 shows the relevant markers. Correlation analysis revealed associations between bone biomarkers and clinical variables (Fig. 2A). PCA and ML highlighted distinct biomarker patterns in RA which can effectively discriminated bone biomarkers profile in RA from controls (Fig. 2B).







Conclusion: Our study helped uncover the distinct bone profile in RA, including changes in bone density and unique biomarker patterns. These findings enhance our comprehension of the intricate links between inflammation, bone dynamics, and RA activity, offering potential insights for diagnostic and therapeutic advancements in managing bone involvement in this challenging condition.

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): Non-Sponsored Symposium Abstracts

NSS1
UNMET GOALS OF TREATED PATIENTS

M. McClung[1,2,3]

[1]Endocrinology-Oregon Osteoporosis Center, Portland, United States, [2]Clinical Investigator, Portland, United States, [3]IOF Board of Directors, Portland, United States

Osteoporosis is a chronic condition characterized by low bone mass (bone mineral density) and disordered skeletal microarchitecture that results in increased risk of fracture. The objectives of treating our patients with osteoporosis is to increase bone strength and to reduce the risk of fracture. Patients need reassurance that the treatment they take is having the desired effect. Unfortunately, we do not have a metric that identifies each fracture that the treatment prevents. Furthermore, even our most effective therapies only reduce overall fracture risk by about 50%. Patients are often disappointed when fractures occur while on therapy, but we must help them appreciate that none of our therapies prevent all fractures, and that the risk of subsequent fractures is reduced while patients remain on therapy.

Our common measures of success include changes in either biochemical markers of bone turnover or bone mineral density. Changes in bone markers are more a measure of treatment compliance than of efficacy whereas the magnitude of treatment-related changes in BMD correlate with the efficacy of therapy to reduce fracture risk. (1) Ofttimes, for a variety of reasons (poor compliance with dosing rules, nutritional deficiency or especially previous osteoporosis therapy, BMD responses to therapy are not observed. In a large observational study, these predictors of treatment failure were identified: poor SF 36 vitality score, two or more falls in the past year and history of prior fracture.(2) Obviously, each of these is a well-known risk factor for fracture.

The concept of goal-directed therapy proposes choosing an appropriate surrogate treatment objective—more commonly a specific BMD target.(3) Such an approach informs choices of both initial therapy and follow-on therapy. When confronted with a fracture on therapy or an inadequate BMD response, the patient should be re-evaluated for possible secondary confounding conditions and compliance should be reassessed before making decisions about continuing or changing therapy. An IOF Working group provided empiric definitions of treatment failure necessitating a change in therapy, including having multiple fractures while on therapy or having a single fracture combined with either significant bone loss or inadequate change in markers of bone turnover. (4) There is scant data about the effects of changing therapy on fracture risk. Understanding the effects of continuing or changing therapy is necessary to make that decision.

References:

1. Black DM, Bauer DC, Vittinghoff E, Lui LY, Grauer A, Marin F, et al. Treatment-related changes in bone mineral density as a surrogate biomarker for fracture risk reduction: meta-regression analyses of individual patient data from multiple randomised controlled trials. Lancet Diabetes Endocrinol. 2020;8(8):672–82.
2. Díez-Pérez A, Adachi JD, Adami S, Anderson FA, Jr., Boonen S, Chapurlat R, et al. Risk factors for treatment failure with antiosteoporosis medication: the global longitudinal study of osteoporosis in women (GLOW). J Bone Miner Res. 2014;29(1):260–7.
3. Lewiecki EM, Kendler DL, Davison KS, Hanley DA, Harris ST, McClung MR, Miller PD. Western Osteoporosis Alliance Clinical Practice Series: Treat-to-target for osteoporosis. Am J Med. 2019;132(11):e771-e7.
4. Diez-Perez A, Adachi JD, Agnusdei D, Bilezikian JP, Compston JE, Cummings SR, et al. Treatment failure in osteoporosis. Osteoporos Int. 2012;23(12):2769–74

NSS2
IMPROVING EFFICACY AFTER POOR OUTCOMES

B. Muzzi Camargos[1,2]

[1]Gynecology-Densitometry-Rede Mater Dei, Belo Horizonte, Brazil, [2]IOF Committe of Scientific Advisors, Belo Horizonte, Brazil

A fracture is an undesirable outcome. Treatments do not eliminate fracture risk: but reduce it. Treatment failure is defined as two or more incident fractures while on antiosteoporosis medications. (1,2)

Self-reported fragility, higher FRAX, recent falls, comorbidities, fractures, glucocorticoids, arm-assisted assist standing, and weight loss are variables associated to suboptimal response to treatment. Multivariable modeling identified 03 independent predictors associated to treatment failure: worse SF-36 score, $\geq$ 2 falls in the past year, and prior fracture. (3)

From these three, two of them are modifiable. SF-36 reflects physical activity and mental wellness. Improvements here shall addresse homecare, physiotherapy, nutrition and psychotherapy. Propensity to falls includes home-safety measures, balance training, management of drugs and routines potentially linked to falls. IOF provides a website on nutrition, exercises and safety measures recommended for fracture prevention; at https://www.buildbetterbones.org.

Although precise thresholds for bone suppression rate isn't established, lower-than-placebo CTX-1 levels are found in patients on antiresorptive treatment. Poor compliance is suspected when bone turnover markers are not reduced by antiresorptive therapy. Bone turnover markers are also helpful, when denosumab is discontinued. Bone formation markers, like P1NP, showed good correlation to anabolic agents. (4,5)

Bone mineral density (BMD) is a surrogate marker of fracture risk reduction and treatment response. It has been used in pivotal clinical trials. Long-term bisphosphonate users significantly improve their BMD mostly at first 3–5 years. Later then, BMD curve trends to a *plateau*. DMAB has demonstrated a sustained BMD gain through 10 years, with no evidence of *plateau* effect. BMD potentially trends down quickly at DMAD withdrawal. Romosozumab has shown remarkable BMD improvements, and may offer the largest BMD accrual on the first year of treatment. BMD follow-up on treatment can also reassure medication effect or arise concerns about failure if bone loss occurs. (6)

In conclusion, close individual care, biochemical tests and imaging assessment should be performed before switching medications, if an incident fracture occurs during osteoporosis treatment.

References:

1. Díez-Pérez A et al. Risk factors for treatment failure with antiosteoporosis medication: the global longitudinal study of osteoporosis in women. J Bone Miner Res 2014; 29(1):260–7.
2. Diez-Perez A et al. Treatment failure in osteoporosis. Osteoporos Int 2012;23(12):2769–74.
3. Brazier JE et al. Validating the SF-36 health survey questionnaire: new outcome measure for primary care. BMJ 1992; 305(6846):160–4.
4. Vasikaran SD, Miura M, Pikner R, Bhattoa HP, Cavalier E; IOF-IFCC Practical Considerations for the Clinical Application of

Bone Turnover Markers in Osteoporosis. Calcif Tissue Int 2023;112(2):148–57.
5. Cavalier E. Role of the Clinical Laboratory in the Assessment of Metabolic Musculoskeletal Diseases. Calcif Tissue Int 2023;112(2):123–125. 6. Carey JJ, Delaney MF. Utility of DXA for monitoring, technical aspects of DXA BMD measurement and precision testing. Bone 2017;104:44–53.

NSS3
CLINICAL PERSPECTIVES AFTER A FRACTURE: COULD IT BE ANY WORSE?

G. Altamar[1,2,3]

[1]Specialist in Internal Medicine and Geriatrics, Cali, Colombia, [2]Professor of Geriatrics in Valley University, Cali, Colombia, [3]President of Colombian Osteoporosis Association-ACOMM, Bogota, Colombia

Osteoporosis is a disease with low bone mass that leads to decreased bone strength and an increased risk of low trauma fractures. The primary aim of therapeutic intervention in osteoporosis is to prevent fragility fractures and their consequences. The available osteoporosis therapies (OT) reduced in trials the risk of fracture by 30–50%. Health professionals must expect incident fractures despite pharmacological treatment. Treatment failure is defined as two or more incident fractures while on OT. Its frequency is variable and depends on epidemiology differences between studies. It's been identified as risk factors to treatment failure: lower SF- 36 vitality score, two or more falls in the previous year, and prior fracture. Even more, the characteristic of patients who suffer major osteoporotic fractures despite treatment to bisphosphonates are number of comedications, dementia, prior fracture, and ulcer disease. In patients with rheumatoid arthritis daily glucocorticoid dosage, immobilization and inflammatory activity of disease are factors to failure. In the retrospective part of the ICARO study, being older and more frequently had multiple vertebral deformities were characteristics for inadequate response to treatment.

Considerations about the diagnosis, choice of initial therapy, and pharmacological adherence are necessary when there is a failure at the OT. If the diagnosis corresponds to primary osteoporosis, an adequate differential diagnosis was made, pharmacological therapy included adequate intake of calcium and vitamin D, associated with non-pharmacological therapy, and the patient is not in the group of who abandon therapy in the first year, other questions need to be considered: do we need specific treatments tailored to the needs of different patients? Frailty elderly people, severe chronic diseases like chronic obstructive pulmonary disease with respiratory insufficiency, heart failure, and dementia were no included in pivotal studies. Patients with polypharmacy and severe disability probably has difficulties to remain adherent to the treatment.

It's time to ask ourselves if the pharmacological current options could be not sufficient and if clinical repercussions of treatment failure, could it be any worse.

References:

1. Ferrari S and cols. Unmet needs and current and future approaches for osteoporotic patients at high risk of hip fracture. Arch Osteoporos (2016) 11: 37 https://doi.org/10.1007/s11657-016-0292-1
2. Adami S and cols. Osteoporosis treatment and fracture incidence: the ICARO longitudinal study. Osteoporos Int (2008) 19:1219–1223 https://doi.org/10.1007/s00198-008-0566-6
3. Cairoli E and cols. Factors associated with bisphosphonate treatment failure in postmenopausal women with primary osteoporosis Osteoporos Int (2014) 25:1401–1410 https://doi.org/10.1007/s00198-014-2619-3
4. Abrahamsen and cols. Characteristics of patients who suffer major osteoporotic fractures despite adhering to alendronate treatment: a National Prescription registry study. Osteoporos Int (2013) 24:321–328 https://doi.org/10.1007/s00198-012-2184-6
5. Díez-Pérez A et al. Risk factors for treatment failure with antiosteoporosis medication: the global longitudinal study of osteoporosis in women. J Bone Miner Res 2014; 29(1):260–7
6. Wen L and cols. Risk Factors for Treatment Failure in Osteoporotic Patients with Rheumatoid Arthritis. https://doi.org/10.3109/14397595.2015.1069444

NSS4
PSORIATIC DISEASE. MUSCULOSKELETAL MANIFESTATIONS

L. Athanassiou[1]

[1]Department of Rheumatology, Asclepeion Hospital, Voula, Athens, Greece

Psoriatic disease is a multifaceted disease which affects all organ systems, amongst those the musculoskeletal system and the skin. The disease has major comorbidities, including the metabolic syndrome. Patients may present with obesity, diabetes mellitus type 2 and arterial hypertension. The disease is an autoinflammatory disease and has a course with flares and remissions. Psoriatic disease presents with psoriatic arthritis and psoriasis. Psoriatic arthritis affects the enthesis, ie the area where tendons attach to the bone. Enthesitis, arthritis, spondylitis are manifestations of psoriatic arthritis. Most patients present with psoriasis and later on may develop psoriatic arthritis. However, in some cases psoriatic arthritis is the first manifestation and later on psoriasis may appear. Pain due to arthritis and enthesitis is a major therapeutic challenge in patients with psoriatic disease. Management of musculoskeletal manifestations is a major issue in the long-term management of psoriatic disease.

NSS5
PSORIATIC DISEASE. COMORBIDITIES

I. Kostoglou-Athanassiou[1]

[1]Department of Endocrinology, Diabetes and Metabolism, Asclepeion Hospital, Voula,, Athens, Greece

Psoriatic arthritis and psoriasis are systemic autoinflammatory diseases which are recently known as psoriatic disease. The disease has a variety of phenotypes and is well known for the involvement of all organ systems. The disease is characterized by an elevated risk of metabolic syndrome, characterized by abdominal obesity, hypertension, hyperglycemia, hyperuricemia and hyperlipidemia. Psoriatic disease and the associated metabolic syndrome may be related to the presence and overexpression of inflammatory cytokines. This association of a systemic inflammatory disease which affects the joints and the skin with the metabolic syndrome confers an increased cardiovascular risk. In addition, the severity of the metabolic syndrome is associated with increased severity of the psoriatic disease and the need for treatment modulation. Fatty liver disease may also accompany psoriatic disease. Inflammatory bowel disease may also be observed in psoriatic disease. Uveitis may also be a manifestation of psoriatic disease. In patients with psoriatic disease the various components of the metabolic syndrome should be therapeutically targeted to decrease the cardiovascular risk.

NSS6
PSORIATIC DISEASE. PSYCHOSOCIAL IMPLICATIONS

Y. Athanassiou[1]

[1]Trinity College, Dublin, Ireland

Psoriasis and psoriatic arthritis are known to occur after a major stress. The disease itself may cause depression. Psoriasis is related with disturbed social integration due to skin involvement and skin lesions. Thus, psoriatic disease may cause psychiatric problems and psychological problems such as depression. The emergence of novel therapeutic agents which cause remission of skin lesions has really improved quality of life in psoriatic disease patients. There is an urgent and unmet need for the discovery of agents which may induce permanent remission of the skin disease and alleviate psychiatric and psychological problems and significantly improve quality of life in psoriatic disease patients.

NSS7
PSORIATIC DISEASE AND REHABILITATION

Y. Dionyssiotis[1]

[1]Spinal Cord Injury Unit, University of Patras, Patras, Greece

Psoriatic disease affects the musculoskeletal system and the skin. The disease is an autoinflammatory disorder and belongs to the spondyloarthritis spectrum. Enthesitis, arthritis, spondylitis are manifestations of the disorder. A program of exercise supervised appropriately may greatly benefit patients with psoriatic disease. Exercise performed under supervision may have a pain alleviating effect. Exercise also strengthens the muscular system and may improve movement and function in the patient. Exercise may also have a beneficial effect on osteoporosis, which may accompany the disorder. Exercise may also be a supplementary measure for the management of depression which may also be observed in psoriatic disease patients. Physiotherapy in the form of exercise for the prevention of ankylosis and preservation of joint function is important for the management of the disease.

NSS8
PSORIATIC DISEASE. CURRENT TREATMENT AND EMERGING THERAPIES

P. Athanassiou[1]

[1]Department of Rheumatology, St. Paul's Hospital, Thessaloniki, Greece

Psoriatic disease which includes psoriasis and psoriatic arthritis is an autoinflammatory disease. Nowadays many drugs are available for the treatment of both psoriasis and psoriatic arthritis. Conventional disease modifying antirheumatic drugs, biologic agents, biosimilars, Janus kinase inhibitors, interleukin-23 inhibitors and small molecules are available for the management of psoriatic disease. It is important to take into account the presenting features of the patients when choosing treatment. The presence of peripheral arthritis, axial disease, enthesitis, dactylitis, skin and nail disease should be considered when choosing medication for every patient. The presence of inflammatory bowel disease and uveitis should also be considered, as these manifestations are part of the spondyloarthritis spectrum. It is the responsibility of the caring physician to apply these new available agents in the therapeutic regimen and to choose the right treatment for each individual patient. Patients' views should also be taken into account and be part of the decision-making process. It is also important that each treatment should be evaluated during the course of the disease and specific alterations made according to the response of the patient to the therapeutic regimen.

NSS9
IMPLEMENTING PHYSICAL ACTIVITY FOR COMMUNITY-DWELLING SENIORS DURING PERIODS OF ISOLATION

F. Buckinx[1,2]

[1]WHO Collaborating Center for Public Health aspects of musculoskeletal health and ageing, Division of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium, [2]Institut Universitaire de gériatrie de Montréal (IUGM), Montréal, Canada

Physical inactivity and sedentary lifestyles affect more than 50% of the older adults. Isolation periods such as the COVID-19-related lockdowns have imposed sedentariness and limited seniors' mobility and engagement in physical activity, which could precipitate or accelerate frailty or loss of functional capacities.

However, maintaining or improving the physical fitness is of critical importance as our population ages. Fortunately, previous studies have shown that pragmatic web-based tools integrating physical activity (PA) programs that are adapted to older adults' functional capacities are potential solutions to prevent their physical decline. Moreover, 50% of seniors use the Internet daily and own a tablet, computer or smartphone. Therefore, the implementation of remote PA using web technology could be a solution to maintain the health of older adults while avoiding physical contact and the risk of contagion. In times of limited physical activity due to pandemics, home-based exercises could be an alternative to counteract physical inactivity and to keep older adults fit and healthy. Therefore, it was important to assess whether distance-training in PA helps to counteract the lockdown deleterious effects (sedentary/inactivity) in pre-disabled seniors.

NSS10
SHORT- AND LONG-TERM EFFECTS OF 4 ONLINE REMOTE PHYSICAL ACTIVITY INTERVENTIONS ON PHYSICAL PERFORMANCES DURING ISOLATION PERIODS IN COMMUNITY-DWELLING OLDER ADULTS

M. Aubertin-Leheudre[1,2]

[1]UQAM, Faculté des sciences, Département des sciences de l'exercice, GRAPA, Montréal, Canada, [2]Centre de recherche de l'institut Universitaire de Gériatrie de Montréal (CRIUGM), Montréal, Canada

Context: Aging, chronic disease and periods of involuntary isolation increase the risk of physical inactivity, which can contribute to physical decline among older adults. Online technology could be an innovative solution to promote physical activity habits in this context.
Objectives: Thus, we aimed to: (1) Examine the short term acceptability, feasibility and health effects of 4 modalities of 12-weeks (3 sessions/week) web-based PA interventions in older adults and; (2) Explore the long-term effects of these remote modalities on active lifestyle and physical performance.
Methods: *Aim-1*: 129 inactive community-dwelling older adults were randomized in 4 modalities: full Live (LLL; n = 38); full Recorded (RRR; n = 45); Live-Recorded-Live (LRL; n = 22) *or* Recorded-Live-Recorded (RLR; n = 24). *Aim 2:* Among this number, 60 (46%: 14 men and 47 women) agreed to participate in the unplanned follow-up evaluation.
Conclusion: In short-term, web-based PA interventions using a decisional tree to prescribe adapted levels are safe, feasible and

acceptable during isolation periods. However, PA interventions which included a higher rate of live sessions appear to be more effective for maintaining or improving physical health. In long-term. Finally, our long-term follow-up analyses show that these exercise training modalities help to maintain motivation levels towards PA practice, which seems to allow the observed beneficial effects to persist over time and mitigate the effects of detraining (post vs. + 1 year). Our analyses also show that the remote exercise groups with higher interactive training rations (LLL and LRL) maintained better PA habits, which seem to help limit age-related physical decline (pre vs. + 1 year).

Overall, these results support the potential of virtual remote modalities as a tool to promote the practice of PA in older adults and allow aging well and more specifically the modalities with greater live training ratios (level of sedentary lower, higher level of physical activity and higher level of retention).

NSS11
UNDERSTANDING OLDER ADULTS' PREFERENCES FOR ENGAGING IN REMOTE INTERVENTIONS FOR IMPROVING PHYSICAL FUNCTION: THE RAMP INTERNATIONAL CONSUMER DELPHI PROCESS

D. Scott[1,2]

[1]Institute for Physical Activity and Nutrition (IPAN), School of Exercise and Nutrition Sciences, Deakin University, Burwood, Australia, [2]School of Clinical Sciences at Monash Health, Monash University, Clayton, Australia

As digital health interventions rapidly evolve, understanding the preferences and needs of older adults is crucial for designing effective strategies for remotely supporting this population to maintain physical function. This presentation will discuss the findings of the RAMP (Remote Assessment and Management of Physical Function) international consumer Delphi process, a project which has engaged with 654 older adults across 15 countries to understand their perspectives on physical function and remote interventions to support its maintenance, by facilitating self-management and collaboration with health professionals.

This modified Delphi process has demonstrated that older adults view physical function as a health priority integral to maintaining independence and quality of life, and that they would value greater support to manage their physical function. It is unclear however how this can most effectively be provided; while the vast majority of older adults are confident that they would be able to use digital technologies to participate in physical function management, there is low agreement on the types of digital health interventions that they would like to engage with (e.g. synchronous supervised versus asynchronous unsupervised exercise training). This appears to reflect a lack of exposure to digital health interventions and that there is no 'one size fits all' approach to remote management of physical function.

The findings from the RAMP study provide valuable insights for health professionals, policymakers, and digital health developers on tailoring remote interventions to align with the expectations and capabilities of older adults.

NSS12
HOW CAN THE RECENTLY WORLD FALLS GUIDELINES BE IMPLEMENTED TO REDUCE FRACTURE RISK IN OLDER PEOPLE

T. Masud[1]

[1]Consultant Physician and Honorary Professor of Geriatric Medicine, Nottingham University Hospital NHS Trust, Nottingham, United Kingdom

In the pathogenesis of fractures, particularly hip fractures, the most important determinants are bone fragility (osteoporosis) and the propensity to fall. Therefore, fracture prevention requires not only treating osteoporosis with drugs but also assessment of falls risk and to implement interventions that have been proven to reduce falls risk. The recently published World Falls Guidelines (Montero-Odasso et al., Age Ageing 2022) were a collaboration of 96 world experts from 39 countries that provide a practical framework for this implementation. The algorithm produced in the guidelines that applies to community dwelling older people and which stratifies falls risk into low risk, intermediate risk and high risk will be discussed. Gait speed and the Timed Up and Go Test have a pivotal role in the stratification. The appropriate interventions for each risk group will be presented. Education on fall prevention measures, physical activity, and exercise that focuses on balance and strength training have important roles in fall prevention across the risk groups. Older people considered at high falls risk should be offered a comprehensive multifactorial assessment with a view to co-design and implement personalized multi-domain interventions. Older people who have already suffered from a fragility fracture are by definition at a high risk of further fractures, and timely falls prevention measures in this group is of utmost importance. Fracture liaison services have an important role to play in these patients and implementing the World Falls Guidelines within these services should be a key goal.

NSS13
SCREENING FRAILTY EASILY IN PRACTICE: VALIDATION OF SIMPLER FRIED FRAILTY SCALE IN DIFFERENT EUROPEAN COUNTRIES

F. O. Kayhan[1]

[1]Associate Professor, Health Sciences University, Gazi Yaşargil Education and Research Hospital, Department of Internal Medicine, Geriatrics section, Diyarbakir, Turkiye

Frailty has been defined as a state of increased vulnerability due to a decline in reserve capacity, resulting in a limited ability to cope with everyday or acute stressors. Frail individuals are more susceptible to adverse health outcomes, including falls and fractures. The prevention of fractures and frailty are related concepts in the context of dependency and mortality, particularly in the older population. Fried frailty scale is the very first and most commonly used assessment scale for an operational definition of physical frailty with its demonstrated success as a predictor of mobility limitations and mortality. Fried frailty scale includes five components, among which three or more were defined as frailty: unintentional weight loss (10 lbs in the past year), self-reported exhaustion, weakness (grip strength), slow walking speed, and low physical activity. This definition proved the benefit of use as shown to be independently predictive (over three years) of incident falls, worsening mobility, disability, hospitalization, and death. However, it needs significant time, devoted personnel, and some equipments, precluding its use in everyday practice. Simpler Fried Frailty Scale is a self-reported version of this scale and is a quick and easy-to-use frailty screening tool. It proved to be useful in some settings and validation studies in different languages and

settings are going on. In this speech, we will introduce and outline the success of the Simpler Fried Frailty Scale as a practical user-friendly tool to identify frail and risky patients for adverse outcomes including fractures. Thereby, we aim to introduce/enhance its easy use in the practice of clinicians involved in the management of osteoporosis.

NSS14
CAN AND HOW MEDICATION REVIEW HELPS US PREVENTING FURTHER FRACTURES?

G. Bahat[1]

[1]Professor, Istanbul University, Istanbul Medical Faculty, Department of Internal Medicine, Division of Geriatrics, Capa, Istanbul, Turkiye

Osteoporotic fragility fractures most commonly occur due to traumas that develop secondary to falls. Falls are common in older adults occurring in about 1/3 of older adults residing in the community and half of the nursing home residents. Among several causes of falls, polypharmacy and inappropriate medication use come front as significant contributors of falls in older adults which can mostly be managed by focused medication review.

Use of drugs that have anticholinergic effects, drugs that cause confusion, balance problems, orthostatic hypotension, those that contribute to urinary incontinence, and those have greater metabolic risks in older adults (e.g. some anti-hypoglycemic drugs) frequently contribute or emerge as the factor(s) causing falls ending with osteoporotic fragility fractures. On the other hand, ignorance of use and misuse of "antiosteoporotic medications and calcium, vitamin D (in case of need)" are also common in older adults emerging as a significant contributor to osteoporotic fractures. Hence, medication review, focused on both the use of fracture risky medications and underuse/misuse of required medications, is an essential and must-do management strategy to decrease fractures. A variety of screening tools to optimize medication use in older adults are available. Some tools provide very practical recommendations to be easily used by clinicians involved in the management of osteoporosis. In this speech, we will outline the major drugs that are commonly responsible for/contribute to falls/fractures and stress the common types of underuse/misuse of pharmacological treatments with the help of the most current and easily accessible medication screening tools in practice, i.e. STOPP/STARTv3 and TIME criteria.

NSS15
VIRTUALLY ALL FRACTURE SITES ARE ASSOCIATED WITH ADVERSE POST-FRACTURE OUTCOMES

J. R. Center[1,2], D. Alarkawi[1,2], T. Tran[1,2], D. Alajlouni[1,2], J. D. Adachi[3], C. Berger[4], J. A. Eisman[1,2], D. Goltzman[5], D. A. Hanley[6], R. Josse[7], S. Kaiser[8], C. S. Kovacs[9], L. Langsetmo[10], J. C. Prior[11], D. Bliuc[2,12], R. D. Blank[1]

[1]Bone Epidemiology Clinical and Translation Science, Garvan Institute of Medical Research, Sydney, Australia, [2]Clinical School, St Vincent's Hospital, School of Medicine and Health, UNSW, Sydney, Australia, [3]Department of Medicine, McMaster University, Hamilton, Ontario, Canada, [4]CaMos National Coordinating Centre, McGill University,, Montreal, Canada, [5]Department of Medicine, McGill University, Montreal, Canada, [6]Department of Medicine, University of Calgary,, Calgary, Canada, [7]Department of Medicine, University of Toronto,, Toronto, Canada, [8]Department of Medicine, Dalhousie University, Halifax, Nova Scotia, Canada, [9]Faculty of Medicine, Memorial University, St. John's, Newfoundland, Canada, [10]School of Public Health, University of Minnesota, Twin cities, Minneapolis, United States, [11]Department of Medicine and Endocrinology, University of British Columbia,, Vancouver, Canada, [12]Bone Epidemiology Clinical and Translation Science, Garvan Institute of Medical Research,, Sydney, Australia

The FRAX model identifies fractures at 4 sites—hip, vertebrae, proximal humerus, and distal radius—as major osteoporotic fractures (MOF). This leads to the misconception fractures at other sites are either not "osteoporotic" or not important. We analysed post-fracture adverse outcomes based on the definitions of proximal (fractures of the axial skeleton and the appendicular skeleton proximal to the elbows and knees) and distal (fractures of appendicular sites distal to the elbows and knees) in multiple large cohorts. Non-MOF fractures are common and associated with adverse post-fracture outcomes. We propose that proximal versus distal fracture is a more useful distinction than MOF versus non-MOF.

In the Dubbo Osteoporosis Epidemiology Study (DOES) and Canadian Multicentre Osteoporosis Study (CaMos), non-MOFs comprised 40% of all initial fractures, resulting in 39% of all subsequent fractures, including 25% of all subsequent hip fractures and 22% of all subsequent vertebral fractures. They also resulted in 38% of all fracture-associated deaths. Multiple studies have shown that fractures at most sites increase the risk of subsequent fracture $\sim$ 2-fold. The risk of subsequent fracture is comparable for non-hip, non-vertebral (NHNV) proximal and distal sites. Both proximal and distal fractures increase the risk of a subsequent hip or vertebral fracture, albeit to a lesser degree than initial hip and vertebral fractures.

Increased mortality is underappreciated following fracture at NHNV sites. In contrast to subsequent fracture risk, proximal but not distal fracture sites are generally associated with increased premature mortality, ranging from 30% to over 2-fold. However, even distal fractures are associated with increased mortality in some subgroups.

Disability is a significant fracture outcome that is not restricted to MOFs. In the few studies that have considered non-hip fractures, disability, decline in quality of life and admission to residential aged care occurred after fractures at all sites. Outcomes are worst for hip, vertebral and pelvic fractures, but both lower and upper limb fractures are associated with a $\sim$ 2-fold increased risk of institutionalization.

In summary, non-MOFs contribute to the burden of subsequent fractures, disability and post-fracture mortality.

NSS16
ASSOCIATION BETWEEN SPECIFIC MULTIMORBIDITY CLUSTERS AND THE RISK OF FRACTURE AND POST-FRACTURE CONSEQUENCES

T. Tran[1,2,3], D. Bliuc[1,2], B. Abrahamsen[4,5,6], W. Chen[1], J. A. Eisman[7,8], L. Hansen[9], P. Vestergaard[10,11,12], T. V. Nguyen[3,8,13], R. D. Blank[1], J. R. Center[1,2,8]

[1]Garvan Institute of Medical Research, Sydney, Australia, [2]Faculty of Medicine, UNSW, Sydney, Australia, [3]School of Biomedical Engineering, University of Technology, Sydney, Australia, [4]Department of Medicine 1, Holbæk Hospital, Holbæk, Denmark, [5]Department of Clinical Research, Odense Patient Data Explorative Network, University of Southern Denmark, Odense, Denmark, [6]Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences University of Oxford, Oxford, United Kingdom, [7]Faculty of Medicine, UNSW Sydney, Sydney, Australia, [8]School of Medicine Sydney, University of Notre Dame Australia, Sydney, Australia, [9]Kontraktenheden, Noth Denmark Region, Denmark, [10]Department of Clinical Medicine, Aalborg University, Aalborg, Denmark, [11]Department of Endocrinology, Aalborg University Hospital, Aalborg, Denmark, [12]Steno Diabetes Center North Jutland, Aalborg, Denmark, [13]Tam Anh Research Center,, Ho Chi Minh City, Vietnam

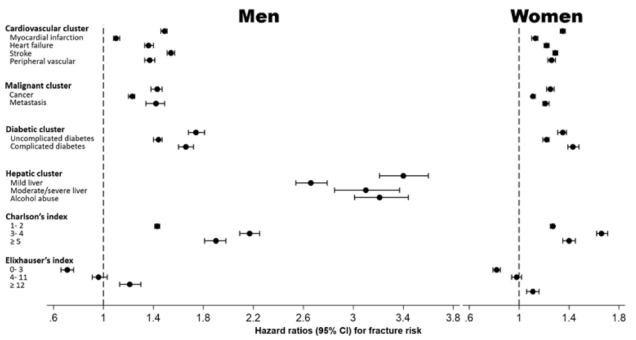
Objectives: To define specific multimorbidity clusters and quantify the association between the multimorbidity clusters and the risk of fractures and mortality.

Material and methods: 1.7 million Danish adults born on or before 1/1/1950 were followed for fractures and death. 32 predefined chronic diseases and fractures were identified from the Danish National Hospital Discharge Register. Death was ascertained from the Danish Register on Causes of Death. We used latent class analysis to identify multimorbidity clusters, Cox's proportional hazards regression to determine association between specific multimorbidity clusters and fracture risk, and relative survival analysis to quantify excess mortality attributable to the combination of multimorbidity and fractures at specific sites.

Results: 793,815 men (age: 64 ± 10) and 873,524 women (65.5 ± 11) were included. Pre-existent chronic diseases grouped into low-multimorbidity (80.3% in men, 83.6% in women), cardiovascular (12.5%, 10.6%), malignant (4.1%, 3.8%), diabetic (2.4%, 2.0%) and hepatic clusters (0.7%, men only). These clusters distinguished individuals with advanced, complex, or late-stage disease from those with earlier-stage disease. During a median follow-up of 14 years (IQR: 6.5, 14), 95,372 men and 212,498 women sustained an incident fracture. Multimorbidity was associated with fracture independent of age and sex. The association between these specific multimorbidity clusters and fracture risk equalled or exceeded that of either the individual chronic diseases most prevalent in each cluster or of counts-based comorbidity indices (Figure). Prespecified sensitivity analysis accounting for competing risk of death yielded consistent results. The combination of multimorbidity clusters and fracture compounded mortality, conferring much greater risk than either alone, though they had only modest impact on recurrent fracture risk.

Conclusions: Multimorbidity clusters may provide greater insight into fracture risk than individual diseases or counts-based comorbidity indices. The compound contribution of multimorbidity to post-fracture excess mortality highlights the need for more comprehensive approaches in these high-risk patients. Our approach could also be used to examine other sentinel health events.

Figure. Specific multimorbidity clusters and their individual components and fracture risk



Disclosures: Thach Tran, Dana Bliuc, Louise Hansen, and Weiwen Chen have no competing interest to declare. Bo Abrahamsen reported having personal fees from Amgen, Gedeon-Richter, UCB, Kyowa-Kirin and Pharmacosmos, and institutional grants from UCB, Kyowa-Kirin and Pharmacosmos. John A. Eisman reported having consulted for and/or received research funding from Amgen, deCode, Merck Sharp and Dohme, and Sanofi-Aventis. Peter Vestergaard reported having received speaker fees and/or research contracts from Amgen, Eli Lilly, Novartis, MSD, UCB, and Servier. Tuan V Nguyen reported having received honoraria for consulting and symposia from Merck Sharp and Dohme, Roche, Servier, Sanofi-Aventis, and Novartis. Robert Blank reported being an advisory member for Amgen, having consulted for Bristol Myers Squibb, having received editorial stipend from Elsevier, having had ownership in Abbott Labs, Abbvie, Amgen, JangoBio, Procter & Gamble, and royalties from Wolters Kluwer. Jacqueline R Center reported having consulted for and/or given educational talks for Amgen, Actavis and Bayer.

NSS17
SELF-ASSESSED LIMITED MOBILITY IS ASSOCIATED WITH INCREASED FRACTURE RISK IN BOTH WOMEN AND MEN

D. Bliuc[1,2], T. Tran[1,3], D. Alarkawi[1,3], W. Chen[1], D. A. Alajlouni[3,4], F. Blyth[5], L. March[6], R. D. Blank[1], J. R. Center[1,3]

[1]Skeletal Diseases Program, Garvan Institute of Medical Research, Sydney, Australia, [2]School of Population Health, Faculty of Medicine and Health, UNSW, Sydney, Australia, [3]St Vincent's Clinical School, Faculty of Medicine and Health, UNSW, New South Wales, Australia, [4]Skeletal Diseases Program, Garvan Institute of Medical Research, Sydney, Sydney, Australia, [5]Concord Clinical School, University of Sydney, Sydney, Australia, [6]Institute of Bone & Joint Research, University of Sydney, Sydney, Australia

Disclosures: Dana Bliuc, Thach Tran, Dunia Alarkawi, Lyn March, Fiona Blyth, and Dima Alajlouni have no conflict of interest to declare. Weiwen Chen has given educational talks for Amgen. Robert. Blank has been a consultant for Bristol Myers Squibb, served on an advisory board for Amgen, received authorship royalties from Wolters Kluwer, received an editorial stipend from Elsevier, received travel support from Amgen, and owns stock in Abbott Labs, Abbvie, Amgen, JangoBio, and Procter & Gamble. Jacqueline Center has been on a medical advisory board for Amgen and given educational talks for Amgen and Teva.

Measured poor physical performance is associated with increased fracture risk. However, whether self-assessed limited mobility is associated with fracture is unknown.

This study aimed to determine the association between self-reported limited mobility and 5-year fracture risk.

45 and Up is a prospective population-based cohort study with questionnaire data linked to mortality and hospital records. A cohort of 122,233 women and 110,365 men with baseline questionnaire data on limited mobility at 1 km self-assessed as "Not at all," "A little" and "A lot" was selected. Fracture events were ascertained from hospital records. Fracture risk was estimated using gender-specific Cox proportional hazards models adjusted for age, weight, falls, and prior fracture.

Approximately 22% of women and men reported limited mobility (12%—"A little" and 10%—"A lot") at baseline. During the first 5 years of follow-up, 6867 women and 4155 men experienced a minimal trauma fracture. Individuals with fracture were older, had more comorbidities, falls and prior fractures and were more likely to report limited mobility. After multivariable adjustment, limited mobility was associated with ~ 32% to > 2-fold greater fracture risk ["A little": 1.32 (1.23–1.41), and 1.46 (1.34–1.59); "A lot": 1.59 (1.49–1.71) and 2.02 (1.86–2.21), for women and men, respectively] (Figure). Limited mobility was significantly associated with fracture risk at all sites. The magnitude of association for all degrees of limited mobility was highest for hip (HR 2.16–3.34) followed by vertebral (HR 1.56–2.21) and non-hip non-vertebral fracture (HR 1.20–1.71).

All degrees of self-reported limitation in mobility are associated with increased fracture risk over and above known fracture risk factors. This study suggests that this simple assessment may be a useful clinical tool to select candidates who would benefit from osteoporosis investigation.

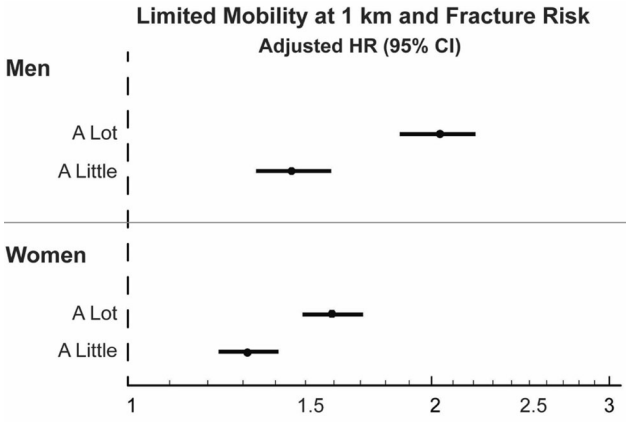


Figure Association between different degrees of limited mobility at 1 km and fracture risk adjusted for age, weight, prior fracture and falls in 45 and Up cohort

NSS18
FUNCTIONAL ASSESSMENT OF VITAMIN D STATUS BY A NOVEL METABOLIC APPROACH

M. Herrmann[1]

[1]Medical University of Graz, Clinical Institute of Medical and Chemical Laboratory Diagnostics, Graz, Austria

Determining serum 25-hydroxyvitamin D [25(OH)D], 24,25-dihydroxyvitamin D [24,25(OH)2D] and the vitamin D metabolite ratio (VMR) allows the identification of individuals with a low vitamin D metabolite profile. Here, we evaluated if such a functional approach provides superior diagnostic information to serum 25(OH)D alone.

25(OH)D, 24,25(OH)2D, and the VMR were determined in participants of the DESIRE (Desirable Vitamin D Concentrations, n = 2010) and the LURIC (Ludwigshafen Risk and Cardiovascular Health, n = 2456) studies. A low vitamin D metabolite profile (vitamin D insufficiency) was defined by a 24,25(OH)2D concentration < 1.2 ng/mL (< 3 nmol/L) and a VMR $< 4\%$. Parathyroid hormone (PTH) and bone turnover markers were measured in both cohorts, whereas 10-year mortality data was recorded in LURIC only.

The median age in DESIRE and LURIC was 43.3 and 63.8 years, respectively. Median 25(OH)D concentrations were 27.2 ng/mL (68.0 nmol/L) and 15.5 ng/mL (38.8 nmol/L), respectively. Serum 25(OH)D deficiency, defined as < 20.2 ng/mL (< 50 nmol/L), was present in 483 (24.0%) and 1701 (69.3%) participants of DESIRE and LURIC, respectively. In contrast, only 77 (3.8%) and 521 (21.2%) participants had a low vitamin D metabolite profile. Regardless of the serum 25(OH)D concentration, a low vitamin D metabolite profile was associated with a significantly higher PTH, accelerated bone metabolism, and higher all-cause mortality than an unremarkable vitamin D metabolite profile.

The personalized assessment of vitamin D status using a functional approach better identifies patients with accelerated bone metabolism and increased mortality than the use of a fixed 25(OH)D cutoff of 20 ng/mL (50 nmol/L).

NSS19
1,25(OH)2D AND 1,24,25(OH)3D—EXPANDING OUR KNOWLEDGE ON VITAMIN D CATABOLISM BEYOND VMR

E. Cavalier[1,2]

[1]PhD, EuSpLM, Liege, Belgium, [2]Head, Department of Clinical Chemistry, University of Liege, CHU de Liege, Liege, Belgium

An increasing body of research is revealing the dynamic nature of vitamin D metabolism, highlighting a diverse range of potentially active metabolites. The degradation pathway is gaining attention, particularly with a focus on the key enzyme, CYP24A1, which is intricately regulated. Notably, 24,25(OH)2-vitamin D and the ratio of vitamin D metabolites are emerging as novel indicators of vitamin D functional deficiency.

CYP24A1 also governs the catabolism of 1,25(OH)2D into 1,24,25(OH)3D. The latter can also be produced through the 1-alpha hydroxylation of 24,25(OH)2D by CYP27A1. Traditionally, 1,24,25(OH)3D production has been viewed as the initial step before complete degradation into calcitroic acid. However, recent studies have challenged this perception, revealing that this metabolite binds up to 40% to the vitamin D receptor (VDR) similar to 1,25(OH)2D. Moreover, it facilitates increased intestinal transport and calcium mobilization from bone, potentially through bone resorption, leading to enhanced bone cell proliferation and osteocalcin synthesis.

Unfortunately, the measurement of this metabolite is complex, and only a limited number of laboratories possess the capability to do so. Nonetheless, reanalysis of samples from the Calgary study demonstrated a dose-related increase in 1,24,25(OH)3D in groups receiving daily doses of 400, 4000, and 10,000 IU of vitamin D, contrary to 1,25(OH)2D. Interestingly, a dose-related reduction in bone density at the distal radius and tibia, along with a slight loss of bone strength, was observed with the higher doses, suggesting that metabolites other than 1,25(OH)2D may play a significant role.

While many studies have focused solely on 25(OH)D, associating clinical outcomes with the increase of this less active metabolite, a re-evaluation incorporating other metabolites such as 24,25(OH)2D and 1,24,25(OH)3D, measured via LC–MS/MS methods on remnant samples, could enhance our understanding of vitamin D's mode of action and prompt a reconsideration of our clinical perspective on this age-old vitamin.

NSS20
THE BURDEN OF HIP FRACTURES AND THE NEED FOR QUALITY INDICATORS

R. E. López Cervantes[1]

[1]Orthopedic Surgeon at Osteoporotic Fractures Clinic-CFO, Guadalajara, Mexico

Hip fractures represent a growing public health concern in Mexico, and the understanding of their epidemiology and outcomes across various healthcare systems are crucial. The epidemiological data reveal a concerning trend of underscoring the urgency for effective secondary prevention measures, notable distinctions in patient care quality, rehabilitation outcomes and morbi-mortality of the fragility fracture patients across the different healthcare systems. These differences emphasize the need for a unified approach to enhance the quality of hip fracture management across the diverse healthcare systems in Mexico.

Drawing lessons from international experiences, the use of quality indicators has proven invaluable in optimizing patient care in various countries. Quality indicators have demonstrated their effectiveness in improving outcomes, reducing complications, and enhancing the overall quality of life for individuals post-hip fracture.

As bone health experts globally grapple with the escalating burden of hip fractures, this project serves as a clarion call for the establishment and implementation of quality indicators tailored to the Mexican context. By fostering collaboration and sharing best practices, this initiative seeks to improve the standard of hip fracture care, ultimately mitigating the impact of this expanding health crisis on the Mexican population.

NSS21
KEY QUALITY INDICATORS FOR HIP FRACTURE CARE: WHAT TO MEASURE AND WHY

J. F. Torres-Naranjo[1]

[1]Centro de Investigación Ósea y de la Composición Corporal, CIO. Universidad de Guadalajara, Guadalajara, Mexico

This presentation explores critical hip fracture care quality indicators, emphasizing the significance of thoughtful selection based on health outcomes, feasibility, and adaptability to specific contexts.

The lecture will focus on several key aspects, discuss the crucial role of prompt surgical intervention in hip fracture cases, highlight the impact of critical indicators such as time to surgery on patient morbidity, mortality, and overall recovery, and emphasize how these indicators serve as a fundamental benchmark for quality care. Examine the importance of collaborative efforts among diverse healthcare professionals in caring for hip fracture patients, discuss the challenges and benefits of fostering multidisciplinary collaboration within specific institutional settings, and stress the need for tailored approaches based on individual patient needs and institutional capabilities.

The presentation will underscore the crucial consideration of not only the relevance of indicators in terms of health outcomes but also their feasibility and applicability to diverse institutional scenarios. We will share insights on how these carefully selected indicators contribute to improved patient outcomes and efficient resource utilization within healthcare systems.

By the end of the lecture, attendees will gain a comprehensive understanding of the rationale behind selecting specific quality indicators for hip fracture care, empowering them to make informed decisions tailored to their respective healthcare institutions' unique challenges and capabilities.

NSS22
IMPLEMENTING QUALITY INDICATORS IN NATIONAL HEALTHCARE SYSTEMS: CHALLENGES AND SUCCESS STORIES

J. C. Viveros García[1,2,3]

[1]Internal Medicine-Geriatrics-Orthogeriatric, Leon, Mexico, [2]Chair Elect Regionalization Committee, Leon, Mexico, [3]Fragility Fracture Network, Leon, Mexico

This presentation will focus on the current state of health systems in developing economies, particularly Latin America and Mexico, mainly in those barriers to their adoption and implementation. We will talk about how, after developing the indicators, the most important health system in Mexico has begun its introduction in some traumatology and orthopedics hospitals. After this, the rest of the healthcare system will follow.

We will describe how heterogeneity in health systems represents one of the most important barriers, as well as some strategies to try to overcome these problems. We will take examples of countries with robust indicator projects, and how they have managed to overcome some of the barriers and current states of said projects.

At the end of the talk, the audience will be able to learn about the challenges of an indicators project in a country like Mexico, as well as how the participants in said project have sought to solve these problems to improve the quality of care.

NSS23
BONE HEALTH AND HORMONAL CONTRACEPTION

R. Bonassi Machado[1,2,3]

[1]Associate Professor of Gynecology, Faculty of Medicine of Jundiai, São Paulo, Brazil, [2]President of Brazilian Specialized Committee in Contraception of FEBRASGO, São Paulo, Brazil, [3]President of SOBRAC–Brazilian Climacteric Society, São Paulo, Brazil

Estrogens are major determinants of bone mass, affecting the acquisition of peak bone mass during adolescence and young adult age and modulating bone mineral density (BMD) and the risk of osteoporosis later in life. Hormonal contraceptives induce a reduction of estrogen and a suppression of progesterone endogenous production by the ovaries. In these women, circulating levels of sex steroids are mainly determined by the dosages present in the contraceptive formulation. If the formulation of the contraceptive is insufficient to grant adequate sex steroid levels, bone tissue metabolism might be affected.

Short-term and long-term steroid contraceptive systems are widely employed in adolescents and premenopausal women; they could induce variation in bone metabolism, but whether these changes increase the overall fracture risk is not yet clear. In adolescent girl, combined oral contraceptives could have a deleterious effect on bone health when their onset is within three years after menarche and when they contain ethinyl estradiol at the dose of 20 mcg. In perimenopausal women, steroid contraceptives seem not influence bone health nor increase osteoporotic fractures risk in menopause. The oral progestogens intake is not related to negative effects on skeletal health. Depot medroxyprogesterone acetate (DMPA) induces a prolonged hypoestrogenism with secondary detrimental effect on healthy bone but progestin-based implants and intrauterine devices have not negative effect on bone health. Contraceptive choice should be tailored evaluating any possible effect on bone health. Clinicians should always perform precontraceptive counselling to identify any coexisting condition that may affect bone health.

NSS24
HOW TO MANAGE THE EARLY NEGATIVE IMPACT OF PREMATURE OVARIAN INSUFFICIENCY ON BONE HEALTH?

J. M. Soares Júnior[1,2,3]

[1]Associate Professor of Gynecology and Head of Obstetrics and Gynecology Department of Medical School of University of São Paulo, São Paulo, Brazil, [2]President of National Specialized Committee of FEBRASGO, São Paulo, Brazil, [3]Vice-President of Federacion Latina De Endocrinologia Ginecologica (FLEG), São Paulo, Brazil

Over 200 million women worldwide suffer from osteoporosis, and postmenopausal women are more vulnerable to the disorder and its serious consequences, including osteoporotic fractures. Preventive measures have not received as much attention as symptomatic treatment to date. Furthermore, as women age, their ovaries produce fewer eggs and less estrogen, which is linked to postmenopausal osteoporosis. Estrogen has a well-established effect in bone remodeling after many years of research. Estrogen contributes to the resorption and strengthening of bones. In addition, premature ovarian insufficiency (POI) is definite when menopause is stable before the age of

40, and the world prevalence is around 2% of the population. Women with POI are exposed to a long period of estrogenic deficiency, which potentially brings higher health bone risk. Most of the studies revealed lower bone density in both the femoral neck and lumbar spine of women with POI compared with healthy women. POI Bone mass had the tendency to remain stable in women treated with estrogen and progestin therapy. However, in women already with bone loss, the therapy—in the doses most frequently used—was not able to revert the loss. Higher doses of estrogen seem to have a positive impact on BMD, as did combined oral contraceptives used continuously. Also, the interruption of HT for longer than one year was linked to significant decrease of bone mass. Although HT brings clear benefits, further studies are needed to establish its long-term effects, as well as doses and formulations with better protective effects on the bone mass of these women. In addition, a holistic therapy with a calcium-rich diet, adequate exercise, sufficient sun exposure, and hormonal therapy is necessary to maintain bone health.

NSS25
BONE HEALTH AND OSTEOPOROSIS SCREENING IN GYNECOLOGIC CANCER SURVIVORS

A. Orcesi Pedro[1,2,3]

[1]Professor of post-graduate Course of Department of Obstetrics and Gynecology from University of Campinas-UNICAMP Medical School, São Paulo, Brazil, [2]Vice-President of National Specialized Committee on Osteoporosis of FEBRASGO, São Paulo, Brazil, [3]Member of the Regional Advisory Board of International Osteoporosis Foundation-Latin America, São Paulo, Brazil

Over the past decades, the incidence of early-onset cancers, often defined as cancers diagnosed in adults under 50 years of age, has increased in multiple countries. Among these, gynecological cancers (cervix and corpus uteri, ovary, vulva and vagina) affect a growing number of women globally, with approximately 1.4 million women diagnosed in 2020. Depending on tumor type and stage, treatments include hysterectomy with or without bilateral salpingo-oophorectomy, radiotherapy, and chemotherapy. These can result in loss of ovarian function and, in women under the age of 45 years, early menopause, which increases the risk of osteoporosis and fragility fractures among other health implications. Also, a growing availability of testing for pathogenic gene variants such as BRCA1/2 and Lynch syndrome, impacts on an increasing number of women undergoing risk-reducing salpingo-oophorectomy (RRSO), which in most cases will be before age 45 years and will induce surgical menopause with the same health consequences. regarding bone loss in women with gynecologic cancers are overall lacking compared to other cancer populations. Consequently, guidelines for osteoporosis screening in women with cancer are largely based on data generated among non-gynecologic cancer survivors. The overall aim after gynecological cancer treatment is prevention of adverse health consequences from early surgical menopause and optimization of long-term physical and emotional health. Retrospective reviews following surgical menopause demonstrated that 56% had osteopenia and 12% had osteoporosis. Prospective studies after RRSO suggest that HRT improves bone density and strength but not to baseline levels. The optimal dose and delivery system of HRT to prevent osteoporosis and fracture is not known. Current guidelines on early menopause are considered an indication for baseline bone mineral density with dual-energy X-ray absorptiometry (DXA) testing within the first year with repeat 1–2 years later. If baseline DXA shows mild osteopenia, repeat every 2 years thereafter or if normal, a repeat study should be considered in 3–5 years. The Fracture Risk Assessment Tool (FRAX) can be used to calculate 10-year fracture risk in women over 40 years. Management to detect and prevent osteoporosis include monitoring bone mineral density and aiming for nutrition orientation, adequate physical activity to specific age groups, call attention to lifestyle habits, fall prevention and when necessary, provide hormone replacement therapy (HRT) to those without contraindications or consider bone-protective therapy according to general guidelines of osteoporosis treatment. Systemic hormone therapy is well established as the most effective treatment for vasomotor symptoms, genitourinary symptoms and to prevent bone loss. However, the role of hormone receptors in many gynecological cancers and their treatment pose a challenge to the management of menopausal symptoms after cancer. An individualized approach taking into account age, tumor type, stage and concomitant therapies and morbidities is of extreme importance. Besides individualization of treatment, additional secondary health benefits (treatment of vasomotor symptoms, genitourinary syndrome of menopause, sexual dysfunction, and quality of life on symptomatic hypoestrogenic women), side effects, contraindications, cost and likelihood of adherence should be carefully considered. It is important to highlight that HRT can also use simultaneously with other medications for osteoporosis (e.g., bisphosphonates, denosumab or teriparatide) based on clinical needs and judgment.

NSS26
CHARACTERIZING BODY COMPOSITION AND BONE HEALTH IN TRANSGENDER INDIVIDUALS RECEIVING GENDER-AFFIRMING HORMONE THERAPY

E. S. Ferreira Filho[1,2,3,4]

[1]Assistant physician of Gynecology Division of Hospital das Clinicas from Medical School of University of São Paulo-USP, São Paulo, Brazil, [2]PhD in progress at Medical School of University of São Paulo-USP, São Paulo, Brazil, [3]Member of Brazilian Specialized Committee in Contraception of FEBRASGO, São Paulo, Brazil, [4]Affiliated member of the European Society of Contraception and Reproductive Health (ESC), Ternat, Belgium

Transgender people are those whose gender identity is different from sex assigned at birth. Unfortunately, they have been chronically neglected by health professionals, and revindications from these individuals' brought attention to the necessary care in academic and healthcare environments. It is historical reparation to include the topic in discussion spaces at congresses, scientific publications, undergraduate and postgraduate courses. Since few is known about body composition and bone health in transgender individuals, this seminar will address the main issues on the subject, focusing on the interpretation of bone mineral density assessment and the impact of gender-affirming hormone therapy on bone health of transgender adolescents and adults.

NSS27
DIAGNOSIS OF FIBROMYALGIA SYNDROME ON THE BASIS OF EVIDENCE BASED MEDICINE

A. Winkelmann[1,2]

[1]Physical and Rehabilitation Medicine (PRM)-Day Clinic for Fibromyalgia, Munich, Germany, [2]Department of Orthopaedics and Trauma Surgery, Musculoskeletal University Center Munich (MUM), University Hospital, Munich, Germany

Objective(s): The diagnosis of FMS is the most important and helpful factor in the course of the disease for the majority of FMS patients1. Diagnosis can improve the quality of life, reduce visits and health care costs[2,3]. Differential diagnosis should be considered and comorbidities should be diagnosed. The correct diagnosis of FMS

with the detection of comorbidities and relevant factors for restrictions of the activities of daily life within the framework of the biopsychosocial model is the key for an individual therapy with the aim of the best possible function and quality of life with FMS[4, 5, 6]. There is controversial discussion, how best to diagnose fibromyalgia syndrome (FMS). There is still a difference between criteria-based FM diagnosis (CritFM) and doctor's FM diagnosis (MDFM)[7].

Material and methods: Reviews, meta-analysis, guidelines and recommendations with the keywords fibromyalgia and diagnosis were reviewed by PubMed-listed publications until January 15, 2024.

Results: The ACR criteria from 1990, 2010 and the revised versions from 2011 and 2016 show an evidence-based process for optimizing the diagnosis of FM[8, 9, 10, 11]. In 1990, the criteria for characterizing FM were developed for clinical studies. The 2010 and 2011 criteria were developed for clinical use as preliminary diagnostic criteria and were initially implemented with graded questions on fatigue and functional complaints. The use of a "generalized pain criterion" in the revised criteria from 2016 eliminates the misclassification of regional pain syndromes as fibromyalgia. The revised ACR 2011/2016 criteria achieved a specificity of 90/87% and a sensitivity of 86/84% (medians). The criteria such as AAPT Diagnostic Criteria for Fibromyalgia 2019 with several dimensions provide an overview of the actual and future development of evidence-based diagnostic criteria[6]. A complete physical examination is required before the diagnosis of FM.[5]

Looking for mental health factors, e.g. depression disorders are more relevant than pain perceived factors for FM severity and quality of life, therefore it is important within the diagnostic process with the view to individual management strategies for best possible quality of life and participation in daily with FMS.[12, 13, 14]

Conclusion: Although the guidelines allow different options for diagnosing FM, the ACR criteria with the revised versions from 2011/2016 are still the gold standard. Don't forget to think about differential diagnosis, comorbidities and factors within the biopsychosocial model.

References

- Arnold LM, Crofford LJ, Mease PJ, Burgess SM, Palmer SC, Abetz L, Martin SA. Patient Perspectives on the Impact of Fibromyalgia. *Patient Educ Couns*. 2008 October; 73(1): 114–120. https://doi.org/10.1016/j.pec.2008.06.0
- Hughes G, Martinez C, Myon E, Taïeb C, Wessely S. The Impact of a Diagnosis of Fibromyalgia on Health Care Resource Use by Primary Care Patients in the UK. Arthritis & Rheumatism Vol. 54, No. 1, January 2006, pp 177–183 https://doi.org/10.1002/art.21545
- White KP, Nielson WR, Harth M, Ostbye T, Speechley M. Does the Label "Fibromyalgia" Alter Health Status, Function, and Health Service Utilization? A Prospective, Within-Group Comparison in a Community Cohort of Adults With Chronic Widespread Pain. Arthritis Rheum 2002 Jun 15;47(3):260–5
- Petzke F, Brückle W, Eidmann U, Heldmann P, Köllner V, Kühn T, Kühn-Becker H, Strunk-Richter M, Schiltenwolf M, Settan M, Wachter M, Weigl M, Häuser W. [General treatment principles, coordination of care and patient education in fibromyalgia syndrome: Updated guidelines 2017 and overview of systematic reviewarticles]. 2017 Jun;31(3):246–254. https://doi.org/10.1007/s00482-017-0201-6. German
- Eich W, Bär KJ, Bernateck M, Burgmer M, Dexl C, Petzke F, Sommer C, Winkelmann A, Häuser W. [Definition, classification, clinical diagnosis and prognosis of fibromyalgia syndrome: Updated guidelines 2017 and overview of systematic review articles]. Schmerz. 2017 Dec;31(6):620. https://doi.org/10.1007/s00482-017-0244-8. German.
- Arnold LM,Bennett RM, Crofford LJ, Dean LE, Clauw DJ, Goldenberg DL, Fitzcharles MA, Paiva ES, Staud R, Sarzi-Puttini P, Buskila D, Macfarlane GJ. AAPT Diagnostic Criteria for Fibromyalgia. J Pain. 2019 Jun;20(6):611–628. https://doi.org/10.1016/j.jpain.2018.10.008. Epub 2018 Nov 16.
- Srinivasan S, Maloney E, Wright B, Kennedy M, Kallail KJ, Rasker JJ, Häuser W, Wolfe F. The Problematic Nature of Fibromyalgia Diagnosis in the Community. ACR Open Rheumatology 1, No. 1, March 2019, pp 43–51. https://doi.org/10.1002/acr2.1006
- Wolfe F, Smythe HA, Yunus MB, Bennett RM, Bombardier C, Goldenberg DL, Tugwell P, Campbell SM, Abeles M, Clark P et al. (1990) The American College of Rheumatology 1990 criteria for the classification of fibromyalgia. Report of the multicenter criteria committee. Arthritis Rheum 33:160–172
- Wolfe F, Clauw DJ, Fitzcharles MA, Goldenberg DL, Häuser W, Katz RS, Mease P, Russell AS, Russell IJ, Winfield JB (2011) Fibromyalgia criteria and severity scales for clinical and epidemiological studies: a modification of the ACR preliminary diagnostic criteria for fibromyalgia. J Rheumatol 38:1113–1122
- Validation of the Fibromyalgia Survey Questionnaire within a cross-sectional survey. Häuser W, Jung E, Erbslöh-Möller B, Gesmann M, Kühn-Becker H, Petermann F, Langhorst J, Weiss T, Winkelmann A, Wolfe F. PLoS One. 2012;7(5):e37504. https://doi.org/10.1371/journal.pone.0037504. Epub 2012 May 25.
- Wolfe F, Clauw DJ,Fitzcharles MA, Goldenberg DL, Häuser W, Katz RL, Mease PJ, Russell AS, Russell IJ, Walitt B. 2016 Revisions to the 2010/2011 fibromyalgia diagnostic criteria. Semin Arthritis Rheum. 2016 Dec;46(3):319–329. https://doi.org/10.1016/j.semarthrit.2016.08.012. Epub 2016 Aug 30.
- Offenbaecher M, Kohls N, Ewert T, Sigl C, Hieblinger R, Toussaint LL, Sirois F, Hirsch J, Vallejo MA, Kramer S, Rivera J, Stucki G, Schelling J,Winkelmann A. Pain is not the major determinant of quality of life in fibromyalgia: results from a retrospective "real world" data analysis of fibromyalgia patients. Rheumatol Int. 2021 Mar 5. https://doi.org/10.1007/s00296-020-04702-5. Online ahead of print.PMID:
- Moreno-Sánchez, P. A., Arroyo-Fernández, R., Bravo-Esteban, E., Ferri-Morales, A., & van Gils, M. (2024). Assessing the relevance of mental health factors in fibromyalgia severity: A data-driven case study using explainable AI. *International Journal of Medical Informatics*, *181*, 105,280.
- Vancampfort, D., Brunner, E., McGrath, R. L., Hemmings, L., & Van Damme, T. (2023). Correlates of sedentary behavior in people with fibromyalgia: A systematic review. *International Journal of Rheumatic Diseases*, *26*(5), 841–849.

NSS28
PHARMACOLOGICAL MANAGEMENT OF FMS ON THE BASIS OF EVIDENCE BASED MEDICINE

F. Dincer[1,2,3,4]

[1]Professor of Physical and Rehabilitation Medicine, Ankara, Turkiye, [2]President Turkish Society of Rehabilitation Medicine, Ankara, Turkiye, [3]ESCEO Scientific Advisory Board Member, Ankara, Turkiye, [4]ESPRM Chair Musculoskeletal Disorders Com., Ankara, Turkiye

Objective: Fibromyalgia syndrome(FMS) is a common musculoskeletal condition characterised, by chronic widespread musculoskeletal pain disorder and reduced pain threshold, with hyperalgesia and allodynia, that is often accompanied by fatigue and disrupted sleep, cognitive disturbance, and multiple somatic symptoms.

Material and methods: In this lecture; Pharmacological Management of Fibromyalgia Syndrome will be mentioned in details, depending to evidence based medicine guidelines and upto date literature.

Results: EULAR has published, Evidence based recommendations about; management of FMS twice and updating it every ten years (2),(3). In Evaluating Evidence; pain, sleep, fatigue, DAL are taken into, consideration.(2),(3)
In our last EULAR-guideline we used, G.R.A.D.E-Grading of Recommendations Assessment Development and Evaluation: This is a four-point scale: strong for/weak for/weak against/strong against; or allowing a recommendation 'use only for research.(2).

In our EULAR guideline most of the following pharmaceutical agents are accepted as, weak for with level of, evidence Ia, except Tramadol Ib.(2).

Amitriptyline (at low dose), (level of evidence-1a), Serotonin-noradrenalin reuptake inhibitors-SNRI-duloxetine or milnacipran, (level of evidence-1a), tramadol, (level of evidence-1a) pregabalin, (Level of evidence-1a); cyclobenzaprine (level of evidence-1a).

The following pharmaceutical agents, SSRI-Selective serotonin reuptake inhibitors, Monoamine oxidase inhibitors, NSAIDs-are accepted as weak against, sodium oxybate, growth hormone, corticosteroids, strong opioids, cannabinoids as strong against.

Dizner et al. mentioned about Pharmacological treatment of FMS including several drugs approved by, FDA and EULAR Recommendations(1). Drug treatments in FMS must take into account the potential risk of adverse effects, including cognitive disturbances. Recommended drugs include pain modulators such as serotonin and noradrenaline reuptake inhibitors (SNRI):duloxetine and milnacipran; low doses of tricyclic antidepressant agent amitriptyline; and antiepileptic agent pregabalin. Non-recommended drugs for FMS include simple analgesics (acetaminophen, metamizole/dipyrone), nonsteroidal anti-inflammatory drugs, glucocorticosteroids, growth hormone, strong opioids, and sodium oxybate.

Duloxetine, milnacipran, pregabalin, and amitriptyline are potentially effective medications for fibromyalgia. Nonsteroidal anti-inflammatory drugs and opioids have not demonstrated benefits for fibromyalgia and have significant limitations.(4).

According to Giorgi et al., although ketamine, vitamin D, and hormone therapy have shown promise in reducing FM symptoms, a meta-analysis has shown that vitamin D supplementation is more effective, than placebo in reducing Fibromyalgia-Impact-Questionnaire-Scores(but not visual analogue scale scores) Finally, further research is needed to optimise their use.(5).

Duloxetine and pregabalin are the most effective drugs for managing FMS as they lead to the greatest improvement, in symptoms and the lowest rate of adverse events requiring study discontinuation. Amitriptyline is more effective in improving sleep, fatigue, and the overall quality of life. However, pregabalin should not be used in FMS patients with retinal nerve fibre layer damage such as those with diabetic retinopathy or glaucoma (5).
Conclusion: In the management of Fibromyalgia, best results are achieved by application of both pharmacological and non-pharmacological procedures.
References:

1. Golab AD et al. Fibromyalgia, etiology, diagnosis and treatment including perioperative management in patients with fibromyalgia. Reumatologia 2023;61,2: 137–148.
2. Macfarlane GJ, Kronisch C, Dean LE, Atzeni F, Häuser W, Fluß E, Choy E, Kosek E, Amris K, Branco J, Dincer F.et al. EULAR revised recommendations for management of fibromyalgia. Ann. Rheum. Dis. 2017;76:318–328.
3. Carville S F, Arendt-Nielsen S, Bliddal H, Blotman F, Branco JC, Buskila D, Da-Silva JAP, Samsøe BD, Dincer F et al. EULAR evidence-based recommendations for management of fibromyalgia syndrome. Ann. Rheum. Dis 2008;67:536–541. https://doi.org/10.1136/ard.2007.071522.
4. Winslow B et al. Fibromyalgia: Diagnosis and Management. Inf. Am. Fam. Physician. 2023;107(2):137–144.
5. Giorgi V et.al.Fibromyalgia:one year in review 2023. Clin Exp Rheumatol. 2023 Jun;41(6):1205–1213.

NSS29
NON-PHARMACOLOGICAL MANAGEMENT OF FMS ON THE BASIS OF EVIDENCE BASED MEDICINE

D. Popa[1,2,3]

[1]Clinical Rehabilitation Hospital Felix Spa, Oradea, Romania,
[2]Romanian Society of Rehabilitation Medicine, Oradea, Romania,
[3]UEMS-PRM delegate, Oradea, Romania

FMS is one of the most common generalized pain syndromes, resulting in a consistent social burden and decreased quality of life. It is well known that FMS patients have substantial impairment in their functional abilities, with impaired performance in everyday activities. The objective of the presentation is to synthesize the comprehensive scientific information available on this topic and to highlight the best evidence with implications for ensuring the best care for the management of people with FMS. The literature available draws attention to a variety of non-pharmacological interventions for the management of FMS, including education, exercise, physical modalities, psychological therapies, balneotherapy, acupuncture, etc., direct transcranial electrical stimulation and much more, focusing on their effectiveness on the most common manifestations of the syndrome as pain, fatigue, sleep, depression and the disease specific quality of life, classified as key symptoms of FMS, according to the Results Measures in Clinical Rheumatology Studies (OMERACT). The exact number and types of non-pharmacological therapies that could be used for the treatment of FMS are not fully known to date and there is no widely accepted definition and classification of these the interventions. However, non-pharmacological interventions appear to be used more frequently than drugs as first-line treatment in recent guidelines. Given the diversity of the type of non-pharmacological therapy used, a discussion on the mechanism of action of each would not be possible in this presentation. With regard to non-pharmacological approaches based on evidence, a certain type of exercise and physical modalities, education, some psychological approaches, brain stimulation, balneotherapy and acupuncture benefit from reliable research conducted through several systematic reviews and meta-analyses. The findings of the available research suggest that several non-pharmacological interventions are effective in FMS and various interventions improve different specific outcomes. Of these, exercise has been shown to be most effective by improving most of the FMS-related outcomes. However, it has also been noted that there is a strong limitation in these research due to the high heterogeneity in terms of methodology, sample size, terminology and description of intervention. However, the abundance of non-pharmacological approaches in the management of FMS, most of which are part of the PRM's specialist tools demonstrates the role of PRM specialists in the management of this highly disabling syndrome.
References:

1. Bidonde J, Fisher E, Perrot S, Moore RA, Bell RF, Makri S, Häuser W. Effectiveness of non-pharmacological interventions for fibromyalgia and quality of review methods: an overview of Cochrane Reviews. Semin Arthritis Rheum. 2023 Dec; 63:152248.
2. Kundakci B, Kaur J, Goh SL, Hall M, Doherty M, Zhang W, Abhishek A. Efficacy of nonpharmacological interventions for individual features of fibromyalgia: a systematic review and meta-analysis of randomised controlled trials. Pain. 2022 Aug 1;163(8):1432–1445.

3. Kundakci B, Hall M, Atzeni F, Branco J, Buskila D, Clauw D, Crofford LJ, Fitzcharles MA, Georgopoulos V, Gerwin RD, Kosek E, Macfarlane GJ, Neal C, Rudin NJ, Ryan S, da Silva JAP, Taylor AM, Turk DC, Whibley D, Doherty M, Zhang W, Abhishek A. International, multidisciplinary Delphi consensus recommendations on non-pharmacological interventions for fibromyalgia. Semin Arthritis Rheum. 2022 Dec;57:152101.
4. Hernando-Garijo I, Jiménez-Del-Barrio S, Mingo-Gómez T, Medrano-de-la-Fuente R, Ceballos-Laita L. Effectiveness of non-pharmacological conservative therapies in adults with fibromyalgia: A systematic review of high-quality clinical trials. J Back Musculoskelet Rehabil. 2022;35(1):3–20.
5. Oral A, Ilieva EM, Küçükdeveci AA, Varela E, Valero R, Berteanu M, Christodoulou N. Generalised and regional soft tissue pain syndromes. The role of physical and rehabilitation medicine physicians. The European perspective based on the best evidence. A paper by the UEMS-PRM Section Professional Practice Committee. Eur J Phys Rehabil Med. 2013 Aug;49(4):535–49.

NSS30
KDIGO: WHAT'S NEW IN CKD-MBD

T. Nickolas[1]

[1]Columbia University, New York, United States

Chronic kidney disease mineral and bone disease (CKD-MBD) is a systemic disorder of bone and mineral metabolism that occurs in patients with CKD. In comparison to the general population, persons with CKD-MBD have higher rates of bone loss, fractures and cardiovascular events. Rates of fracture and cardiovascular events increase in parallel with severity of kidney dysfunction. Currently, there are no approved therapies to mitigate the effects of CKD-MBD, and contemporary management strategies to prevent adverse clinical events are controversial and/or have unproven clinical efficacy.

The Kidney Disease: Improving Global Outcomes Working Group (KDIGO) published Clinical Practice Guidelines for the diagnosis, evaluation, prevention, and treatment of CKD-MBD in 2009 and 2017. In October 2023, KDIGO held a Controversies Conference to review new lines of evidence both to support current strategies or to provide rationale to update strategies on the evaluation and management CKD-MBD.

This talk will focus on the data supporting the KDIGO recommendations for the diagnosis and management of bone disease in patients with CKD. There will be an emphasis on studies published since the 2017 guidelines, how future guideline updates may be effected by the current state of the literature, and how the field can address scientific and clinical knowledge gaps so that effective therapeutics and management strategies can be developed and implented.

NSS31
THE ASSOCIATION BETWEEN VERTEBRAL FRACTURES AND VASCULAR CALCIFICATIONS IN PATIENTS WITHOUT AND WITH CKD

M. Fusaro[1,2]

[1]National Research Council (CNR), Institute of Clinical Physiology (IFC), Pisa, Italy, [2]Department of Medicine, University of Padova, Padova, Italy

Despite Skeletal Fragility in CKD having been known since 1966, the nephrology community has poorly investigated this severe complication. CKD patients with moderate chronic renal failure (glomerular filtration rate < 45 mL/min) have a risk of hip fractures two-fold that of the general population, indicating a tight correlation between skeletal fragility and renal failure (1–3). In end-stage renal failure the incidence of hip fracture is at least 4 times higher than in the general population (4–6).

Few studies have been carried out on vertebral fractures (VFs) in CKD patients. In the secondary hyperparathyroidism by CKD is mainly affected cortical bone. We found VF prevalence to exceed 50% in hemodialysis patients (55%), similar to that of a control group affected by primary osteoporosis, and similar to the 50% prevalence reported for osteopenia postmenopausal women or in a renal transplant cohort with a prevalence of 57% (7–9). Noteworthy, there is a bidirectional link between VFs. and Vascular Calcifications (VCs), even more marked in CKD patients than in the general population. (10). Furthermore, VFs are strongly associated to higher mortality (11). In the last September, there has been KDIGO Controversies Conference on Chronic Kidney Disease–Mineral and Bone Disorder: Progress and Knowledge Gaps Towards Personalizing Care meeting, with an update, chair Professor Markus Ketteler.

Furthermore, Bone Biopsy histomorphometric analysis is the gold standard for the diagnosis and classification of different forms of renal osteodystrophy, indeed it is the only technique able to provide comprehensive information on static and dynamic parameters of turnover, cortical and trabecular microarchitecture, and mineralization defects. In particular, in clinical practice, bone biopsy yields relevant indications to support therapeutic choices in CKD impacting the management and prognosis of uremic patients.

Objective of the symposium will be to provide all participants with an in-depth and thus educational growth on prevention, diagnosis, and therapy of osteoporosis in the chronic kidney disease based on the latest evidence in the literature, but also offer the necessary tools to create a fruitful multidisciplinary collaboration, which is essential to improve care for our patients.

References:

1. 1. Nickolas TL, McMahon DJ, Shane E (2006) Relationship between moderate to severe kidney disease and hip fracture in the United States. J Am Soc Nephrol 17:3223–3232.
2. Nitsch D, Mylne A, Roderick PJ, Smeeth L, Hubbard R, FletscherA (2009) Chronic kidney disease and hip fracture–related mortality in older people in the UK. Nephrol Dial Transplant 24:1539–1544.
3. Kinsella S, Chavrimootoo S, Molloy MG, Eustace JA (2010) Moderate chronic kidney disease in women in associated with fracture occurrence independently of osteoporosis. Nephron Clin Pract 116:c256–c262.
4. Alem MA, Sherrad DJ, Gillen DL, Weiss NS, Beresford SA, Heckbert SR, Wong C, Stehman-Breen C (2000) Incidence and risk of hip fracture among patients with end-stage renal disease. Kidney Int 58:396–399—Jadoul M, Albert JM, Akiba T, Akizawa T, Arab L, Bragg-Gresham JL, Mason N, Prutz KG, Young EW, Pisoni RL (2006).
5. Tentori, F.; McCullough, K.; Kilpatrick, R.D.; Bradbury, B.D.; Robinson, B.M.; Kerr, P.G.; Pisoni, R.L. High rates of death and hospitalization follow bone fracture among hemodialysis patients. Kidney Int. 2014, 85, 166–173) associated with increased morbidity and mortality.
6. Ketteler M, Block GA, Evenepoel P et al. Executive summary of the 2017 KDIGO chronic kidney disease-mineral and bone disorder (CKD-MBD) guideline update: what's changed and why it matters. Kidney Int 2017; 92:26–36.
7. Fusaro, M.; Tripepi, G.; Noale, M.; Vajente, N.; Plebani, M.; Zaninotto, M.; Guglielmi, G.; Miotto, D.; Carbonare, L.D.; D'Angelo, A.; et al. High Prevalence of Vertebral Fractures Assessed by Quantitative Morphometry in Hemodialysis

Patients, Strongly Associated with Vascular Calcifications. Calcif. Tissue Int. 2013, 93, 39–47.
8. Arboleya, L.; Díaz-Curiel, M.; Del Río, L.; Blanch, J.; Díez-Pérez, A.; Guañabens, N.; Quesada, J.M.; Sosa, M.; Gómez, C.; Muñoz-Torres, M.; et al. Prevalence of vertebral fracture in postmenopausal women with lumbar osteopenia using MorphoXpressSR (OSTEOXPRESS Study). Aging Clin. Exp. Res. 2010, 22, 419–426.
9. Giannini, S.; Sella, S.; Silva Netto, F.; Cattelan, C.; Dalle Carbonare, L.; Lazzarin, R.; Marchini, F.; Rigotti, P.; Marcocci, C.; Cetani, F.; et al. Persistent secondary hyperparathyroidism and vertebral fractures in kidney transplantation: Role of calcium-sensing receptor polymorphisms and vitamin D deficiency. J. Bone Miner. Res. 2010, 25, 841–848.
10. Fusaro M, Tripepi G, Plebani M, Politi C, Aghi A, Taddei F, Schileo E, Zaninotto M, La Manna G, Cianciolo G, Gallieni M, Cosmai L, Messa P, Ravera M, Nickolas TL, Ferrari S, Ketteler M, Iervasi G, Mereu MC, Vettor R, Giannini S, Gasperoni L, Sella S, Brandi ML, Cianferotti L, De Caterina R. The Vessels-Bone Axis: Iliac Artery Calcifications, Vertebral Fractures and Vitamin K from VIKI Study. Nutrients. 2021 Oct 12;13(10):3567. https://doi.org/10.3390/nu13103567.)
11. Cristina Castro-Alonso, Luis D'Marco, Jaume Pomes ete a. Prevalence of Vertebral Fractures and Their Prognostic Significance in the Survival in Patients with Chronic Kidney Disease Stages 3–5 Not on Dialysis. J Clin Med. 2020 May 25;9(5):1604. https://doi.org/10.3390/jcm9051604.
12. Fusaro M, Re Sartò GV, Gallieni M et al.Time for Revival of Bone Biopsy with Histomorphometric Analysis in Chronic Kidney Disease (CKD): Moving from Skepticism to Pragmatism. Nutrients. 2022 Apr 22;14(9):1742. https://doi.org/10.3390/nu14091742.

NSS32
BONE BIOPSY: HOW, WHEN, AND WHY PERFORM IT IN CKD PATIENTS?

M. Haarhaus[1]

[1]Karolinska Institutet, CLINTEC, Division of Renal Medicine, Stockholm, Sweden

Chronic kidney disease (CKD) is a state of premature aging. Features of senescence, including cardiovascular disease and increased skeletal fragility, are common manifestations of CKD. Fracture risk and cardiovascular mortality are multifold higher in CKD than in the age-matched general population. While primary and secondary forms of osteoporosis frequently coincide with CKD, CKD-associated complex disturbances of mineral metabolism, termed CKD – mineral and bone disorder (MBD), increase bone fragility even further.

CKD-MBD is characterized by biochemical alterations of mineral metabolism, vascular pathology, and disturbed bone metabolism. Based on bone histomorphometry, skeletal manifestations of CKD-MBD are described as disturbances of bone turnover, mineralization, and volume, collectively termed renal osteodystrophy (ROD).

Management of CKD-MBD differs largely, depending on its biochemical, vascular, and skeletal manifestations. Non-invasive diagnostic criteria have been developed to support therapeutic decision making, however, regarding ROD, non-invasive methods lack the ability to sufficiently differentiate between high and low turnover and absence or presence of disturbed mineralization. Thus, an iliac crest bone biopsy for histomorphometric analysis has been described as the gold standard for diagnosis of ROD. Despite its ability to diagnose different forms of ROD with high precision, a bone biopsy has several disadvantages, rendering it not an optimal diagnostic tool for every day clinical practice. Furthermore, expertise to perform classical histomorphometry is rare, causing long waiting times for diagnostic results.

It is thus of importance to integrate bone biopsies in a wider armament of diagnostic tools for the management of manifestations of CKD-MBD. Acknowledging the exceptionally high burden of fragility fractures and cardiovascular disease in CKD, recent development has shifted from a nihilistic to a more active approach to therapy and prevention despite the paucity of large interventional trials specifically targeting the CKD population. While earlier clinical guidelines specified clear indications for bone biopsies, based on pathophysiological considerations, current guidelines are less specific, but define indications by the relevance of the biopsy for clinical decision making.

I will discuss recent developments within skeletal diagnostics for CKD-MBD with a strong orientation towards the clinical management of its main manifestations, i.e. fragility fractures and cardiovascular disease. I will further discuss current clinical indications for bone biopsies in cKD and how to integrate results into the clinical management of patients with CKD.

NSS33
EPIDEMIOLOGY OF VD IN RHEUMATIC DISEASES

P. Clark[1]

[1]Director Clinical Epidemiology Unit, Federico Gomez Hospital, UNAM, Mexico, Mexico

Vitamin D has been a hot spot over the last 2 or 3 decades not only in its effects on bone and mineral metabolism. Its deficiency can lead to rickets, osteomalacia and osteoporosis, mainly mediated by secondary hyperparathyroidism, but also to the possible association of this pro hormone in many diseases in which, the immune system is compromised as in the case of the rheumatic diseases.

Various effects on several components of the innate and adaptative immune system has been reported as the effects of VDR activation the proliferation, function and differentiation of immune cells: however, the role of VD either in prevention or/and treatment of rheumatic diseases is inconclusive due to several confounders as the coexistence with comorbidities, lack of sun exposure or outdoor activities.

There are few epidemiological studies regarding the epidemiology of VD deficiency and rheumatic diseases. In a recent review from *N. Charoenngam (Vitamin D and Rheumatic Diseases: a Review of Clinical Evidence. Int. J. Mol, Sci 2021, 22)* some data are found:

In Rheumatoid Arthritis, multiple observational studies have shown the association of VD status with the incidence and severity of RA. Women in the highest tertile of VD intake had lower risk for RA by 33% compared with those in the lowest tertile. In Systemic Lupus Erythematosus, a low level of serum 25 (OH)D has been associated with deficiency in many case–control studies. Nonetheless in the Nurses' Health Studies I and II, of 186,389 women and 190 incident SLE patients, there was no association between VD intake and risk of incident SLE.

Regarding the Spondyloarthropathies, low levels of serum 25 (OH)D have been observed in patients with AS and IBD compared with healthy individuals.

In Gout and Hyperuricemia, a meta-analysis of 7 cross sectional studies in individuals with increased serum uric acid has been associated with deficiency/insufficiency of VD.

In Osteoarthritis and other rheumatic diseases, as well as in fibromyalgia some studies found the association of disease with low levels of VD.

This association, however, still controversial since the reported literature is controversial, while some studies find this correlation some other don't. The primary studies as well as meta-analysis have

several methodological limitations and further studies carefully designed are needed to find the evidence of this clinical question.

NSS34
VITAMIN D AND SYSTEMIC LUPUS ERYTHEMATOSUS, ANTIPHOSPHOLIPID SYNDROME, AND SYSTEMIC SCLEROSIS

J. L. A. Morales Torres[1]

[1]Rheumatologist, Hospital Aranda de la Parra, León, Mexico

Immunomodulatory effects of Vitamin D (VD) are well recognized, beyond its importance on bone homeostasis. Effects on immune cells, through interactions with VD Receptor expressed on them, are well known. Patients with Systemic Lupus Erythematosus (SLE); antiphospholipid syndrome (APS) and systemic sclerosis (SS), show a higher frequency of VD insufficiency and deficiency, when compared with healthy controls, and hypovitaminosis D is associated with more active disease and cardiovascular risk in SLE; more thrombotic events in APS and with clinical and serological features of SS. Although randomized clinical trials of supplementation with VD in those diseases are scant and results inconsistent, it is generally accepted that patients with SLE, APS and SS should maintain a serum 25-OH-D level of at least 30 ng/ml to preserve bone health and possibly 40–60 ng/ml for immune and overall health.

NSS35
VITAMIN D LEVELS IN PATIENTS WITH RHEUMATOID ARTHRITIS

O. D. Messina[1]

[1]IRO Medical Research Centre, Buenos Aires, Argentina

Rheumatoid arthritis (RA) ia an autoimmune disorders marked by characteristic chronic inflammation of joints in addition of systemic manifestations. Vitamin D is really an hormone rather than a vitamin with immunomodulatory properties and its deficiency has a significant role in the clinical course of RA. Vitamin D deficiency was observed in up to 50% of the patients with RA. Vitamin D deficiency is significantly correlated with disease severity of RA and with DAS28 values.

Main reasons of VtD low levels are, nutritional factors long term glucocorticoid therapy and age related factors in patients with RA. The nuclear vitamin D receptor (VDR = for 1'25) = H = 2D3 is expressed by many cells within the immune system both in innate and adaptive immunity.

Lee et al. showed a correlation between VitD levels and RA activity and published a meta analysis with a deficiency of the 55.2% of patients with RA vs 33.2 in the general population. Cecchetti et al. shoed similar results in the COMEDRA study. It is advisable to maintain VitD serum levels: 30 ng-ml 75 nmol–Lt = and possibly: than 40 ng –ml to achieve maximal benefits from VitD actions in immune health and overall health.

NSS36
FOLLOW-UP THROUGH IMAGINOLOGICAL ASSESSMENT: ADXA, TBS, RX, VFA, 3D-DXA AND QCT

B. Muzzi Camargos[1]

[1]Rede Materdei Saúde, Belo Horizonte, Brazil

Patients eligible to receive bone anabolic therapy have peculiarities linked to degenerative diseases of the spine, fractures and advanced age compared to those patients eligible for oral bisphosphonates. These peculiarities imply on artifactual findings that may interfere with imaging assessment.

Areal DXA is specially affected by lumbar spine degenerative diseases and by calcification of abdominal aorta. Fractures within the L1L4 segment are common but can me neutralized by software resources. The DXA software is able to apply vertebra exclusion, thus reducing the influence of a crushed vertebra on the segment studied. The exclusion criteria is either visual or numerical. If there is a visible fracture or T-score discrepancy (above 1.0 SD T-score) within L1L4 segment, the corresponding vertebra shall be excluded. Other sites like proximal femur and forearm can be used for diagnosis when lumbar spine is impaired for DXA purposes.

TBS is less affected by degenerative diseases and than aDXA. However, it is also affected when there is a massive influence of these artifactual changes within the sites of interest. On primary osteoporosis, TBS predicts fracture independent of BMD and other CRFs, including FRAX. TBS adds predictive value alongside FRAX and/or BMD T-score and the greatest utility is for patients close to an intervention threshold. On secondary osteoporosis, TBS predicts fracture associated with secondary osteoporosis, such as in type 2 diabetes, chronic kidney disease and rheumatological conditions. TBS adds value when monitoring the skeletal response to aromatase inhibitors and glucocorticoids. TBS is useful for stratifying osteoporosis treatment and for monitoring individual response to treatments including denosumab, PTH/PTH analogues and romosozumab.

Plain radiographic X-ray and VFA are useful tools for spine fracture identification. VFA can be done in the same device of aDXA thus it is a practical and low radiation exposure method. VFA lacks precision when the vertebral fractures are in lower grade, classified as mild deformities within the vertebral body. This limitation is due the lower resolution. Plain X-ray radiographs are performed on a separate device from densitometers. But it is considered of higher resolution than aDXA. It allows radiographs to identify even mild compression vertebral fractures. VFA has limitations also on higher spine because of other structures and scoliosis. Patients on anabolic therapy usually have vertebral fractures assessed by CT and MRI or even plain radiographs. Therefore, VFA might be more useful on fracture-free and low density patients, not submitted to a thorough imaging investigation.

3D-DXA and QCT are analogue methods. The first one is a DXA-based method which based it's ROC curve on QCT images. Both target bone quality rather than bone density. Although well recognized, their clinical use is less popular than the othwer methods listed above.

References

- Lewiecki EM, et el. International Society for Clinical Densitometry. Best Practices for Dual-Energy X-ray Absorptiometry Measurement and Reporting. J Clin Densitom. 2016;19(2):127–40.
- Harvey NC, et al. Trabecular bone score (TBS) as a new complementary approach for osteoporosis evaluation in clinical practice. Bone. 2015;78:216–24.
- Engelke K, et al. Clinical Use of Quantitative Computed Tomography (QCT) of the Hip in the Management of Osteoporosis in Adults. J Clin Densitom 2015;18(3):338–58.
- Rosen HN, et al. The Official Positions of the International Society for Clinical Densitometry: vertebral fracture assessment. J Clin Densitom 2013;16(4):482–8.
- Dudle A, et al. 2D-3D reconstruction of the proximal femur from DXA scans: Evaluation of the 3D-Shaper software. Front Bioeng Biotechnol. 2023 1;11:1111–020.

NSS37
CLINICAL MANAGEMENT OF PATIENTS UNDER ANABOLIC THERAPY

A. M. Cheung[1]

[1]Staff, General Internal Medicine and Endocrinology, Department of Medicine and Joint Department of Medical Imaging University Health Network and Sinai Health System, Toronto, Canada

Anabolic therapies are revolutionizing osteoporosis treatment. We can now build bone tissue, rather than just preventing its loss. This session will address who should receive anabolic therapy based on various international guidelines, how long they should receive it for, and how to manage patients receiving anabolic therapy. We will also discuss what laboratory tests/ bone biomarkers may be helpful while on therapy, and things to look out for in the management of these patients. We will also discuss what therapies to consider after completion of the course of anabolic therapy, and whether and when to consider re-use of another course of anabolic therapy.

References:

- Russow G, Jahn D, Appelt J, Märdian S, Tsitsilonis S, Keller J. Anabolic Therapies in Osteoporosis and Bone Regeneration. Int J Mol Sci. 2018 Dec 26;20(1):83. https://doi.org/10.3390/ijms20010083. PMID: 30587780; PMCID: PMC6337474.
- Bandeira L, Lewiecki EM. Anabolic therapy for osteoporosis: update on efficacy and safety. Arch Endocrinol Metab. 2022 Nov 11;66(5):707–716. https://doi.org/10.20945/2359-3997000000566. PMID: 36382760; PMCID: PMC10118815.

NSS38
HOW TO WRITE A NARRATIVE REVIEW

S. Sabico[1]

[1]Professor, King Saud University, Riyadh, Saudi Arabia

Among the literature reviews found in peer-reviewed journals, narrative reviews are undoubtedly the most common type and easiest to draft. As a survey of select, previously published data on a certain topic, narrative reviews also require less resources compared to original articles, with the exception perhaps, of consensus/position statements, a type of narrative review which requires an assembly of experts, usually commissioned by medical societies that will serve as practitioner guidelines for a specific disease. Narrative reviews published in high impact journals are almost always by invitation (solicited), but most journals encourage narrative reviews from early-career researchers. While narrative reviews are non-systematic and less rigorous, it should nevertheless be structured with a topic that is both timely and relevant to the intended audience. Conventionally, narrative reviews need to first have a defined scope and audience, a planned search of literature taking into consideration the level of evidence, time period and outcomes, to name a few. These selected studies can then be structured and synthesized according to themes and relevance, creating the backbone or outline of the review. Lastly, narrative reviews should conclude with statements that match the intended purpose, in light of the available evidence presented, highlighting the gaps that need further research.

NSS39
HOW TO WRITE A SYSTEMATIC REVIEW AND META-ANALYSIS

G. Honvo[1,2]

[1]Assistant Professor of Epidemiology and Public Health, University of Abomey-Calavi, Department of Biodemical Sciences, Abomey-Calavi, Benin, [2]Collaborator University of Liège, Division of Public Health, Epidemiology and Health Economics, Liège, Belgium

Systematic reviews play an important role in clinical medicine and clinical epidemiology, and particularly in the development of clinical guidelines. In fact, they are considered the highest level of evidence for informing clinical and public health decisions. As such, they have become one of the most important types of studies published in the scientific literature over the past decades. However, while there has been a dramatic increase in the number of systematic review articles, reports have shown decrease in the quality of these publications. This presentation aims to discuss how to write a good systematic review and meta-analysis article, and particularly errors to avoid (or good writing practices to adopt) in drafting systematic review manuscripts for submission to scientific Journals. Drawing from extensive experience in peer-reviewing systematic review and meta-analysis articles, as well as in handling this type of research papers as Academic Editor for scientific Journals, the speaker intends to share with the audience some major issues usually seen in systematic review and meta-analyses manuscripts, that should be avoided in preparing these manuscripts. The presentation will specifically cover issues related to guidelines for systematic reviews and meta-analyses, formulation of research question/objective, selection criteria, search strategies, data synthesis/analysis, and more generally the reporting of the methods section of a systematic review article.

NSS40
HOW TO WRITE AN UMBRELLA REVIEW

N. Veronese[1]

[1]Professor, University of Palermo, Palermo, Italy

An umbrella review is a review of systematic reviews or meta-analyses. Some researchers propose that a useful strategy in the rain of evidence. Writing an umbrella review involves a meticulous and structured approach to assimilate and evaluate a broad spectrum of evidence from previously conducted systematic reviews and meta-analyses. The initial step entails defining a well-focused research question to guide the literature search and inclusion criteria. Critical appraisal is fundamental in assessing the methodological quality and bias of the included reviews. Utilizing established tools, such as AMSTAR, helps in evaluating the rigor of each review, aiding in the selection of high-quality evidence. Transparency in reporting the search process, inclusion criteria, and methodological assessments is imperative to enhance the credibility and reproducibility of an umbrella review. Synthesizing evidence from diverse reviews requires a meticulous data extraction process. The umbrella review also provides an opportunity to explore sources of heterogeneity among reviews and potential biases. In the final stages, a comprehensive narrative or quantitative synthesis is crafted to present a cohesive overview of the evidence landscape. Emphasizing clarity and accessibility in conveying the findings ensures that the umbrella review serves as a valuable resource for clinicians, researchers, and policy-makers. In conclusion, crafting an umbrella review demands a rigorous and systematic approach from formulating a precise research question to synthesizing evidence and transparently reporting the methodology. This methodological precision enhances the utility of the umbrella review in guiding future research directions and informing evidence-based practice.

NSS41
WHAT IS 'CLINICAL AI' AND HOW IS IT USED IN OSTEOPOROSIS?

N. Fuggle[1]

[1]Associate Professor, MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom

The field of artificial intelligence is not new, but with the advent of high-speed computing, novel algorithmic architectures and large, multi-modal datasets, there is growing excitement around this technology and it's potential ability to impact healthcare.

In this session we will demystify the jargon which surrounds AI and look at the opportunities for deployment in clinical practice.

To date, the majority of examples of Clinical AI tools approved for use in clinical practice have been in the field of imaging, due to the presence of large libraries to supply training datasets and, in the UK, these include products to assist with mammography assessment and analysis of CT brain scans for the presence of ischaemic stroke.

A similar trend for the development of AI 'Software as a Medical Device' (SaMD) exists in the field of osteoporosis, although AI and machine learning have been used for the development of risk prediction algorithms, and the analyses of muti-omic datasets for potential therapeutic targets.

Imaging studies to date have focused on utilising DXA images to improve fracture prediction beyond bone mineral density (BMD), opportunistic measurement of BMD from routinely performed imaging, opportunistic identification of vertebral fractures from routinely performed imaging and the derivation of bone microarchitectural features from alternative imaging modalities.

Despite the excitement, there are substantial challenges which must be borne in mind and addressed as the field moves forward, including issues around data privacy, establishing clear lines of accountability and working towards explainability of these 'black boxes'.

NSS42
ETHICAL CONSIDERATIONS WHEN USING OF AI IN CLINICAL PRACTICE

I. The Artificial Intelligence Ethics Team[1]

[1]Alan Turing Institute, London, United Kingdom

The ethics of artificial intelligence is often depicted as relating to white robots interacting with humans via versions of Michelangelo's 'Creation of Adam' in which a mechanical digit connects with a human finger. However, the reality of the field lies not in robotics, but in the careful consideration of the ethical issues surrounding the development and deployment of mathematical algorithms or software which are used to perform tasks normally requiring human levels of intelligence, including weighing the benefits against the substantial risks.

There is a dualism to artificial intelligence with the same techniques used, on the one hand, to seek patterns in healthcare data to better understand human health and disease and, on the other hand, to expound disinformation and pose threats to cybersecurity. AI ethics is used to map the path between these potential benefits and possible harms via the consideration of ethical principles in this context.

Furthermore, as AI develops, the deferral of decision-making to these tools has the potential to lead a loss of autonomy, interpersonal interaction and human agency. At worst, AI has the potential to violate human rights, the the use of an individual's data without permission violating their right to privacy and the reproduction of unfair or discriminatory patterns in data entrenching health disparities and clinical biases, leading to discrimination.

Other ethical questions to consider in the present include:

- How will the current driving forces of AI excitement bear upon the use of AI by future generations?
- How will legal and regulatory frameworks stay abreast of the rapidly developing landscape of technological advancement?

Indeed, with the burgeoning excitement around the deployment of artificial intelligence in healthcare and clinical practice, must come a rigorous and thoughtful consideration of the ethical, regulatory and legal implications of using these tools and the development of frameworks which address the above questions, risks and concerns.

NSS43
ARTIFICIAL INTELLIGENCE IN OSTEOPOROSIS: INCLUDING A CASE STUDY OF VERTEBRAL FRACTURE DETECTION: AI FOR VERTEBRAL FRACTURE SCREENING: A UK PERSPECTIVE—FINDINGS OF THE ADOPT STUDY

K. Javaid[1]

[1]Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford, Oxford, United Kingdom

Fracture Liaison Services (FLSs) are widely endorsed for the provision of secondary fracture prevention in adults who have recently been diagnosed with a fragility fracture. Identifying patients with non-spinal fractures is relatively straightforward. However, there are unique challenges in the identification of adults with vertebral fractures, who are often at a very high fracture risk. The widespread use of CT scanning in general clinical practice represent a potential opportunity to help close this care gap. There is mounting evidence that a significant number of adults have radiological vertebral fractures that are not being reported or actioned to mitigate the patient's fracture risk. This oversight represents a missed opportunity to prevent avoidable fractures in the short and longer term.

Several AI models have been trained and tested to identify patients with moderate and severe vertebral fractures. However, there is a paucity of data describing implications from the real-world implementation of these models into routine clinical practice. The ADOPT study, funded by the UK NIHR, is a programme of work specifically designed to test the implementation and performance of an AI model for detecting vertebral fractures (Nanox-AI) across five public hospitals in the NHS. In this symposium, we will share insights around the specific challenges of obtaining local information governance approvals, integrating the software with local radiology systems, clinical training on the detection of vertebral fractures, patient co-production of clinical pathways and service improvement. We will also discuss the performance of the AI model in comparison with routine radiological reports and local radiology re-reading using different sensitivity and specificity settings of the AI model, including impacts on the local FLS workforce.

NSS44
GLOBAL EXPERIENCES IN FLS IMPLEMENTATION AND SECONDARY FRACTURE PREVENTION IN POLICY—ASIA–PACIFIC

M. Chandran[1]

[1]Singapore General Hospital, Osteoporosis and Bone Metabolism Unit, Department of Endocrinology, Singapore, Singapore

By 2050, the number of hip fractures is projected to increase to in the Asia Pacific region from 1.13 million in 2018, to 2.54 million in 2050, resulting in staggering projected costs of almost USD 13 billion[1,2]. Implementation of Fracture Liaison Services has seen an increase from 96 FLS mapped on the Capture the Fracture® Map of Best Practice at the beginning of 2020 to 227 at the beginning of 2024. Regional initiatives such as APCO provide resources for osteoporosis and fragility fracture management such as the Bone Health QI Toolkit launched in 2022[3]. Together, IOF and APCO are developing a 2023 update to the 2013 Asia–Pacific Bone Health Regional Audit, with work starting in 2023[2]. These efforts are promising, and must be continued with support from all levels of decision-making to prepare for the projected more than doubling of hip fractures in the region by 2050.

1. Cheung, C.-L., et al., An updated hip fracture projection in Asia: The Asian Federation of Osteoporosis Societies study. Osteoporosis and sarcopenia, 2018. 4(1): p. 16–21.
2. International Osteoporosis Foundation. Landmark agreement between IOF and APCO to develop Asia–Pacific Bone Health Regional Audit 2023. Available at https://www.osteoporosis.foundation/news/landmark-agreement-between-iof-and-apco-develop-asia-pacific-bone-health-regional-audit-2023. (Accessed January 2024).
3. Asia–Pacific Consortium on Osteoporosis. APCO Bone Health QI Toolkit. 2022. Available at https://apcobonehealth.org/apco-bone-health-qi-tool-kit/. (Accessed January 2024).

NSS45
GLOBAL EXPERIENCES IN FLS IMPLEMENTATION AND SECONDARY FRACTURE PREVENTION IN POLICY—EUROPE

M. L. Brandi[1]

[1]Fondazione FIRMO and Observatory for Fragility Fractures, Florence, Italy

Fragility fractures are a major concern for public health in Italy with approximately 570,000 fragility fractures per year, with associated costs of €9.5 billion in 2019[1]. Guidelines have been developed for the diagnosis, risk assessment, treatment, and management of fragility fractures in Italy[2]. Recent initiatives to track the burden of fragility fractures have been developed, such as the Fragility Fracture Observatory which acts as a monitoring centre for the epidemiology of fragility fractures in Italy. Despite these encouraging advances, additional work needs to be done as more than 2 million Italian women at high risk of fracture remain untreated for osteoporosis and only 10% of Italian hospitals have a Fracture Liaison Service (FLS).

1. International Osteoporosis Foundation. Solutions for Fracture Prevention in Italy. 2022. Available at https://www.osteoporosis.foundation/sites/iofbonehealth/files/2023-01/2022_country_profile_it.pdf. (Accessed January 2024).
2. Sistema Nazionale per le Linee Guida. Diagnosi, stratificazione del rischio e continuità assistenziale delle fratture da fragilità. Available at: https://www.iss.it/documents/20126/8331678/LG-392_Fratture-da-Fragilit%C3%A0_v3.pdf/4e697d88-35ea-3130-b2e7-60cad527c10d?t=1677495524202 (Accessed January 2024).

NSS46
GLOBAL EXPERIENCES IN FLS IMPLEMENTATION AND SECONDARY FRACTURE PREVENTION IN POLICY—NORTH AMERICA

F. Jiwa[1]

[1]Osteoporosis Canada, Toronto, Canada

Fragility fractures are a major concern for public health in Canada with approximately 130,000 fragility fractures per year and 2.2 million people above 40 years old living with osteoporosis[1]. Canadian Clinical Practice Guidelines for screening, fracture risk assessment, treatment, and management of patients with osteoporosis and fragility fractures were developed in 2010 and updated in 2023[2]. Osteoporosis Canada's FLS Registry audits and maps FLS that meet the 8 essential elements of Fracture Liaison Services, which are equally represented on the Capture the Fracture® Map of Best Practice. Additional work in Canada needs to be undertaken as less than 20% of the Canadians who have a fragility fracture receive an osteoporosis diagnosis, bone mineral density test, or an osteoporosis medication prescription within the following year post-fracture[1].

1. Osteoporosis and related fractures in Canada: report from the Canadian Chronic Disease Surveillance System. Ottawa: Public Health Agency of Canada; 2020:1–85. Available: https://www.canada.ca/content/dam/phac-aspc/documents/services/publications/diseases-conditions/osteoporosis-related-fractures-2020/osteoporosis-related-fractures-2020.pdf (accessed January 2024).
2. Morin SN, Feldman S, Funnell L, et al. Clinical practice guideline for management of osteoporosis and fracture prevention in Canada: 2023 update. CMAJ. 2023;195(39):E1333–E1348. https://doi.org/10.1503/cmaj.221647.

NSS47
GLOBAL EXPERIENCES IN FLS IMPLEMENTATION AND SECONDARY FRACTURE PREVENTION IN POLICY—LATIN AMERICA

P. Clark[1]

[1]School of Medicine, National University of Mexico (UNAM), Mexico City, Mexico

Health care costs of managing low bone density (osteopenia/osteoporosis) plus caring for fragility fractures in Mexico was estimated at 411 million USD in 2010, with an expected rise of 42% by 2020[1]. The number of Fracture Liaison Services part of the Capture the Fracture® Network has nearly tripled from 47 at the beginning of 2020 to 136 at the beginning of 2024. Ten years after the first regional audit report for the Latin American region in 2012, the International Osteoporosis Foundation published the LATAM Audit 2021, which highlights both the increase in availability of diagnostic tools and pharmacological and non-pharmacological treatment alternatives, as well as the strong need for national epidemiological data to drive policy change[2].

1. Carlos F, Clark P, Galindo-Suárez RM, Chico-Barba LG (2013) Health care costs of osteopenia, osteoporosis, and fragility fractures in Mexico. *Archives of osteoporosis* 8 (1):1–9. https://doi.org/10.1007/s11657-013-0125-4
2. International Osteoporosis Foundation. Epidemiología, costo e impacto de la osteoporosis y las fracturas por fragilidad. Available at https://www.osteoporosis.foundation/sites/iofbonehealth/files/2022-09/LATAM%20Audit%202021%20-%20Secci%C3%B3n%20General%20-%20FINAL.pdf. (Accessed January 2024).

NSS48
SENIOR CONTRIBUTIONS TO FRAILTY, NUTRITION AND PHYSICAL ACTIVITY

F. Buckinx[1]

[1]WHO Collaborating Center for Public Health aspects of musculoskeletal health and ageing, Division of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium

The SENIOR ("Sample of Elderly Nursing homes Individuals: an Observational Research") study is a prospective follow-up of a cohort of more than 600 people living in nursing homes in Belgium, which started in 2013. Its primary objective was to improve understanding of the risk factors, consequences, and dynamics of frailty. In addition, it aimed to explore strategies for managing frailty in order to reduce the incidence of adverse health events. This symposium will present the key findings from this cohort, enriched by the comprehensive annual collection of demographic, clinical, and anamnestic data.

First, the symposium will address the cross-sectional dimension, highlighting the prevalence of frailty using different diagnostic tools. The variables associated with frailty in the SENIOR cohort will be presented, with a particular focus on muscle strength, sarcopenia, and agism. The longitudinal aspect will then unfold, identifying adverse health events, key risk factors, and their interactions within the first three years of monitoring this cohort.

In addition, the symposium will emphasise the fundamental role of nutrition and physical activity in the management of frailty and present findings from the SENIOR cohort in these areas. In terms of nutrition, a meticulous investigation present precise energy intake using the food-weighing method, as well as revealing energy expenditure using indirect calorimetry in nursing home residents. In particular, it will shed light on the complex relationship between psycho-emotional factors and food intake. Shifting the focus on physical activity, the symposium will highlight the importance of promoting qualitative physical activities in nursing homes to improve residents' quality of life. It will consider strategies to improve the motivational context of group physical activity sessions. It will also explore the feasibility and impact of innovative physical activity programmes, based on the development of novel approaches such as a giant play mat or the organisation of competitions within nursing homes.

The richness of the demographic, clinical, and anamnestic data collected annually makes this cohort of great interest to the scientific community. The SENIOR study has the potential to fill important gaps in the frailty literature.

NSS49
SARCOPHAGE CONTRIBUTIONS TO SARCOPENIA, MALNUTRITION AND QUALITY OF LIFE

C. Beaudart[1]

[1]Department of Biomedical Sciences, Clinical Pharmacology and Toxicology Research Unit, Namur Research Institute for Life Sciences (NARILIS), Faculty of Medicine, University of Namur, Namur, Belgium

The Sarcopenia and Physical Impairment with Advancing Age (SarcoPhage) prospective cohort study, initiated in 2013 in Liège, Belgium, enrolled 534 community-dwelling individuals aged 65 years and older. The study initially aimed to evaluate the short and medium-term health and functional consequences of sarcopenia. Over a decade of meticulous follow-up with annual assessments, this study has produced over 25 scientific publications, prompting a comprehensive reflection on its diverse outputs and original data.

Pr. Charlotte Beaudart will present the study's most significant scientific achievements, with a focus on key findings that have shaped the field. First, early publications from the SarcoPhage study will be presented, as those investigated variations in sarcopenia prevalence using different tools for measuring muscle mass, strength, and physical performance, as well as diverse cutoffs for parameter assessment, yielding highly cited papers. Subsequently, this cohort study played a crucial role in developing, in 2015, the first health-related quality of life questionnaire tailored for sarcopenia, i.e. the SarQoL. Today, this questionnaire is available in 35 languages, widely employed by researchers and clinicians globally, and endorsed by the European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (ESCEO) as the sole validated health-related quality of life questionnaire for sarcopenia. Beyond assessing the repercussions of sarcopenia on physical parameters and quality of life, the SarcoPhage study also delved into malnutrition research. Significantly, the study revealed the profound impact of malnutrition on both the onset of sarcopenia and mortality. More recently, the study has also explored the World Health Organization's emerging concept of Intrinsic Capacities within its Healthy Ageing program.

In this symposium, an overview of the SarcoPhage Study will be presented, highlighting its pivotal scientific achievements and key findings. Emphasis will be placed on how these discoveries have contributed to advancing the broader research landscape on healthy ageing.

NSS50
THE SENIOR AND SARCOPHAGE COHORTS TO STUDY COVID AND LONG-TERM MORTALITY

C. Demonceau[1]

[1]WHO Collaborating Center for Public Health aspects of musculoskeletal health and ageing, Division of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium

The SENIOR ("Sample of Elderly Nursing homes Individuals: an Observational Research") and the SarcoPhAge (Sarcopenia and Physical Impairment with Advancing Age) are two Belgian prospective cohort studies with a duration of 8 and 10 years, respectively. While a direct comparison of these two cohorts is challenging due to inherent differences in their composition, this symposium offers a unique opportunity to place the results of both in parallel, taking advantage of the rich longitudinal data collected.

This symposium will first highlight the associations, or lack thereof, between frailty, sarcopenia and their related components in the context of the Covid-19 pandemic and how these factors may influence the incidence and severity of the Covid-19.

The symposium will also focus on long-term mortality within these cohorts. By using longitudinal data over different follow-up periods, we have identified factors associated with 8- and 10-year mortality, providing new insights for a comprehensive understanding of the dynamics of mortality in the older population.

The wealth of data provided by these cohorts not only offers new insights into the vulnerabilities and health trajectories of older people but also provide major information for tailoring public health interventions for older people in our communities.

NSS51
TREATMENT INDUCED OSTEOPOROSIS IN WOMEN WITH BREAST CANCER

P. Hadji[1]

[1]Head of the Frankfurt Center of Bone Health, Frankfurt, Germany

Osteoporosis is one of the most frequent diseases in postmenopausal women leading to an increased fracture risk due to the physiologic loss of the bone protective effects of estrogen. Hereby, several risk factors for fracture such as prevalent fracture, low BMD, age, family history, use of glucocorticoid use etc. have been identified. Additionally, the further reduction of endogenous estrogens with chemotherapy (CHT), GnRH-Analogues or aromatase inhibitors (AI) continuously increases fracture risk. Breast cancer (BC) on the other hand is the most frequent cancer type in women. Recent reports indicated a continuous increased incidence while mortality, due to early diagnosis and treatment improvements is decreasing. Dependent on specific tumor characteristics, radiation, chemotherapy (CHT), antibody treatment as well as endocrine treatment has been introduced into the adjuvant clinical treatment setting.

Some but not all of this cancer specific treatments interfere with bone turnover leading to an accelerate bone loss referred to as cancer treatment induced bone loss (CTIBL). Whereas CHT leads to an unspecific increased of bone resorption, Aromatase inhibitor (AI) reduces residual serum endogenous estrogen level and is associated with a decrease of bone mineral density (BMD) and increased fracture risk. Independent of the type of AI administered, bone loss is 2–3-fold increase compared to healthy, age matched postmenopausal controls. Therefore, several guidelines have emerged to help managing CTIBL in women with BC including strategies to identify and treat those at highest risk for fractures.

The lecture will summarize the current knowledge on CTIBL and fracturing risk and indicates current treatment guidelines and intervention options.

NSS52
THE IMPACT OF ANDROGEN DEPRIVATION THERAPY ON BONE HEALTH IN PATIENTS WITH PROSTATE CANCER

J. E. Brown[1]

[1]Division of Clinical Medicine, University of Sheffield, Sheffield, United Kingdom

Around 1 in 8 men will experience prostate cancer (PC) in their lifetime. Endocrine-based treatment including androgen deprivation therapy (ADT) has proven to be a mainstay of PC management for many years and many patients now receive ADT throughout their cancer journey. Whilst successful in reducing testosterone levels and improving PC survival, ADT is associated with negative impacts on bone health, leading to bone loss and consequent increased risk of osteoporotic fracture.

Many newer systemic therapies for PC have been introduced in recent years and patients may now live with their disease for many years, but these treatments may themselves cause detrimental effects on the skeleton. The long-term consequences of treatment are therefore of increasing importance. However, these PC patients are often not routinely referred to bone specialists for optimisation of their bone health, despite the fact that the resulting increased risks of osteoporotic fragility fractures (often requiring hospitalisation) represent substantial problems for patients and healthcare systems.

Bone loss (reduction in areal bone density) is easily measured using dual energy x-ray absorptiometry and more recent technology (eg high resolution peripheral quantitative computed tomography), shows that ADT not only reduces areal bone density, but also volumetric bone density and also impairs the mechanical properties of bone.

Bone loss can be prevented or repaired using bone targeted agents such as bisphosphonates or the fully humanised antibody, denosumab. The detailed guidance for managing the skeletal health of patients receiving ADT will be discussed in the light of current treatment pathways for PC patients.

NSS53
CURRENT GUIDELINE DEPENDENT TREATMENT OF BONE METASTASIS

C. Confavreux[1,2]

[1]INSERM UMR 1033-LYOS, Université Claude Bernard Lyon 1, Lyon, France, [2]Bone Metastasis Expert Center (CEMOS), Department of Rheumatology, Hospices Civils de Lyon, Lyon, France

Bone is the third most common site for solid cancer metastasis. Metastases to the bone can cause severe pain, pathological fractures of the long bones and spine, and may even lead to spinal cord compression or hypercalcemia. These complications can result in the suspension of oncological treatment, bed rest, loss of autonomy, and require specific and heavy care involving radiotherapy, surgery, or interventional radiology. Therefore, it is crucial for clinicians to take all necessary measures to prevent skeletal-related events. Along with local treatments and oncological therapy, the use of systemic anti-resorbing agents (ARA) such as zoledronic acid and denosumab has proven effective in reducing the occurrence of bone events in solid tumors.

Trials with ARAs were conducted approximately fifteen years ago, utilizing a 24-month monthly administration schedule in patients with a low survival expectancy. Today, we are witnessing remarkable progress in oncology that is improving patient survival and bone response. This progress is causing us to reconsider our use of ARAs in bone metastases, in order to optimize the balance between benefits and risks (such as osteonecrosis of the jaw and atypical fractures) and enable long-term bone management for patients. These developments raise new questions for rheumatologists. How to interact cross-functionally with the oncologist? How to evaluate and re-evaluate the risk of fracture? Is it possible to space out the treatment? Is it possible to suspend it? If so, what would be the procedures? The presentation will address these topics and emphasize the importance of collaborative work among physicians of different specialities, preferably during the Bone Metastasis Multidiciplinary Meeting.

Conflictofinterests: Oncology conferences: Amgen, Lilly.
Research grants

- Prix Amgen France pour la Science et l'Humain 2023.
- MSD Avenir.
- SFR Dreamer—Novartis.
- Amgen research grant.

References:

Coleman R, Hadji P, Body JJ, Santini D, Chow E, Terpos E, Oudard S, Bruland Ø, Flamen P, Kurth A, Van Poznak C, Aapro M, Jordan K; ESMO Guidelines Committee. Bone health in cancer: ESMO Clinical Practice Guidelines. Ann Oncol. 2020 Dec;31(12):1650–1663.

Confavreux C, Bellière A, Decroisette C, Le Bon M, Barrey C, Brevet M, Pialat JB, Girard N, Tescaru A, Wegrzyn J, Chaudier P, Stacoffe N, Massardier E et le comité de rédaction des référentiels Auvergne Rhône-Alpes en oncologie thoracique. Référentiel sur les Métastases Osseuses dans le Cancer Bronchique: actualisation 2024. ARISTOT 2024. Accessible sur http://referentiels-aristot.com/

Confavreux CB, Pialat JB, Bellière A, Brevet M, Decroisette C, Tescaru A, et al. Bone metastases from lung cancer: A paradigm for multidisciplinary onco-rheumatology management. Joint Bone Spine. 2019 Mar;86(2):185–94.

Confavreux CB, Follet H, Mitton D, Pialat JB, Clézardin P. Fracture Risk Evaluation of Bone Metastases: A Burning Issue. Cancers. 2021 Nov 15;13(22):5711.

NSS54
VASCULAR-BONE NEXUS: A NARRATIVE REVIEW OF THE EVIDENCE FROM EPIDEMIOLOGICAL STUDIES AND RANDOMISED CONTROLLED TRIALS

J. R. Lewis[1]

[1]Edith Cowan University, Perth, Australia

Background: In older individuals at higher risk of musculoskeletal disorders, after the skeleton, the vasculature is often the next most calcified structure within the body. Epidemiological studies, genetic studies and randomised controlled trials link low bone mass and fractures with cardiovascular disease and vice versa.
Objectives: Perturbations of the vascular-bone nexus during aging and chronic disease can lead to accelerated bone loss and vascular calcification. It is essential to improve our understanding of these vascular-bone interactions to develop new ways to prevent bone loss and vascular calcification development as well as address the potential risk–benefit for therapeutic agents to treat both skeletal deterioration and cardiovascular disease. Insights from this bi-directional signalling between the blood vessels and the skeleton are therefore essential to maintain both bone and vascular health during ageing.
Results: We and others have published data identifying supporting this link and the overlap in cytokine regulation of bone and vascular phenomena. However, these signalling pathways and evidence from epidemiological studies and randomised controlled trials for the link remain to be poorly understood. This narrative review will discuss how and why vascular calcification develops and progresses, how and which blood vessels are commonly assessed for vascular calcification and the epidemiological evidence for the temporal nature of the relationship between vascular calcification and measures of bone health and fracture. The review will also discuss and summarise the effects of bone active medications on vascular calcification and cardiovascular events from randomised controlled trials and will discuss the latest advanced in the field of vascular-bone assessment and the clinical implications of this work.
Conclusions: This presentation will provide an overview of the current literature of the vascular-bone nexus including new advanced in the field, existing knowledge gaps and highlight areas for future research.

NSS55
BONE RESORPTION AS A SOURCE OF CALCIUM AND PHOSPHATE IN ATHEROSCLEROSIS

G. Klein[1]

[1]University of Texas Medical Branch/Department of Orthopaedic Surgery and Rehabilitation, Galveston, United States

Objective: Epidemiologic studies link chronic inflammatory conditions with coronary artery calcification and cardiovascular disease. Limited studies indicate reduced cardiovascular and overall mortality in patients using bisphosphonates. Since chronic inflammatory conditions cause bone resorption and bisphosphonates reduce bone resorption, bone resorption may provide the calcium and phosphate precipitating in coronary arteries. The aim of the study was to construct a mechanism whereby calcium and phosphate released from bone could deposit in coronary arteries.
Materialsand methods: Searching PubMed with key words: calcium, phosphate, inflammation, bone, coronary artery calcium, and calcium-sensing receptor (CaSR), I examined the fate of calcium and phosphate entering the circulation from resorbing bone, functional changes in the CaSR from children to adults, inflammatory effects of calcium in the circulation, and known effects of calcium and phosphate in small arteries.
Results: I reviewed 4 inflammatory conditions and burns, which are also accompanied by chronic inflammation: post-menopausal osteoporosis, spinal cord injury, osteoarthritis, and rheumatoid arthritis. Each of the four are associated with bone loss and increased coronary artery calcification. Children with inflammatory conditions up-regulate the CaSR in response to cytokines, causing hypocalcemic hypoparathyroidism with hypercalciuria. When fully grown, adults lose capacity of the CaSR to up-regulate in response to cytokines, possibly by CaSR inhibition by phosphate binding, resulting in persistence of resorbed calcium in the circulation. Calcium accumulation can increase chemokine production by immune cells and stimulate the NLRP3 inflammasome, thus perpetuating or intensifying an inflammatory response. Phosphate from resorbed bone also persists in the circulation due to a decline in Klotho with age and inflammation. In the arterial circulation, calcium-stimulated chemokines can initiate inflammation of lipid deposits and calcium can interact with the vascular endothelial CaSR to increase vessel tone, causing luminal narrowing. Phosphate can initiate osteoblastic differentiation of the vascular endothelium, producing hydroxyapatite which can incorporate the excess calcium and phosphate.
Conclusions: Bone is the likely source of calcium and phosphate precipitating in coronary arteries. Patients with chronic inflammation should have earlier assessment of cardiovascular function and earlier initiation of anti-resorptive treatment or a trial of calcimimetics to reduce coronary artery calcification.
Reference: Klein GL eLife 2022 Dec 29;11:e83841.

NSS56
SARCOPENIA COMPONENTS AND DEFINITIONS: PREVALENCE, AGREEMENT AND PREDICTIVE CAPACITY REGARDING MORTALITY

L. Westbury[1]

[1]MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom

Sarcopenia is characterised by the excessive loss of muscle mass, strength and function with age. It is associated with physical disability, falls, and considerable healthcare costs. This lecture presents findings on the prevalence and agreement between sarcopenia definitions proposed by the Sarcopenia Definitions and Outcomes Consortium (SDOC) and the 2019 European Working Group on Sarcopenia in Older People (EWGSOP2), and examines their association with earlier mortality. For example, in a multinational assembly of Western cohort studies of community-dwelling older people, sarcopenia prevalence was low for EWGSOP2 (1.1%) and SDOC (1.7%); agreement was weak between these definitions (kappa statistic: 0.17) *(Westbury* et al*., JCSM 2023;14(1):565–75)*. However, both definitions were strongly associated with mortality (EWGSOP2 (hazard ratio (95% CI 1.76 (1.42, 2.18)), SDOC (2.75 (2.28, 3.31))).

Findings on the predictive capacity of sarcopenia components regarding mortality will also be presented. For example, in a pooled analysis comprising the Osteoporotic Fractures in Men Study, the Health, Aging and Body Composition Study and the Hertfordshire Cohort Study, grip strength (hazard ratio (95% CI) per SD decrease: 1.14 (1.10, 1.19)) and gait speed (1.21 (1.17, 1.26)) were strongly related to mortality after accounting for established mortality risk factors. However, inclusion of grip strength and gait speed in a Cox

model which already included these established risk factors only increased Harrell's Concordance Index from 0.69 to 0.70. This suggests that the use of these sarcopenia components for identifying older people at risk of earlier mortality may be limited.

NSS57
SARCOPENIA COMPONENTS AND DEFINITIONS AS PREDICTORS OF FRACTURE RISK

N. Harvey[1]

[1]MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom

FRAX is the most widely used fracture risk assessment tool which estimates an individual's 10-year probability of hip and major osteoporotic fracture. This lecture presents recent research exploring the relationship between sarcopenia components and definitions and risk of incident fracture after accounting for FRAX probability and BMD.

In the Osteoporotic Fractures in Men Study cohorts, higher gait speed (hazard ratio (95% CI) per SD increase: 0.85 (0.79, 0.90)), grip strength (0.77 (0.72, 0.82)) and appendicular lean mass index (0.85 (0.80, 0.90)) were associated with lower risk of incident major osteoporotic fracture *(Harvey* et al*., JBMR 2018;33(12):2150–7)*. Although associations were robust after adjustment for FRAX probability, the ALM index association was attenuated after adjustment for BMD. In contrast, greater pQCT calf muscle density was associated with lower risk of incident fracture, independent of FRAX probability, falls and femoral neck BMD *(Harvey* et al*., JBMR Plus 2022;6(12):e10696)*.

Sarcopenia status was predictive of incident major osteoporotic fracture for 10 out of the 11 definitions considered (hazard ratios: 1.39—2.07) *(Harvey* et al*., JBMR 2021;36(7):1235–44)*. Associations were robust to adjustment for FRAX probability (without BMD); but adjustment for BMD attenuated associations, especially for sarcopenia definitions based on DXA-derived ALM.

These findings suggest that whilst physical performance measures may have a role in fracture risk assessment, the predictive capacity of DXA ALM over and above BMD is limited. These findings also demonstrate a complex interplay between measures of bone, muscle strength, function, and quality, in determining fracture risk.

NSS58
PREVALENCE AND BURDEN OF SARCOPENIA IN SUB-SAHARAN AFRICA

K. Ward[1]

[1]MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom

Little is known about the prevalence and burden of sarcopenia and poor functional ability in low- and middle-income countries. Given the exponential rise in adults aged over 60 years in these populations, data are urgently required to inform potential burdens of disease in coming decades.

In earlier work, among 249 women and 239 men, aged 40 years and older from rural Gambia, the prevalence of sarcopenia was 20% (men) and 45% (women) according to the FNIH definition, and 19% (men) and 10% (women) according to EWGSOP *(Zengin* et al*., JCSM 2018;9(5):920–8)*. These prevalences differ greatly compared to Western populations of a similar age range. This suggests that currently accepted international definitions of sarcopenia may need refinement for application in this population.

The MUFASSA (Musculoskeletal Functional Ability in sub-Saharan Africa) programme of work has collated data on over 3000 community-dwelling men and women living in urban regions of The Gambia, Zimbabwe and South Africa. This lecture will review current gaps in knowledge and present recent research on the prevalence of sarcopenia and poor functional ability, and whether they predict falls, frailty and disability in three contrasting countries, at different stages of nutritional and epidemiological transition.

NSS59
CONSTRUCTION OF A PROJECT TO ASSESS THE RISK OF FALLS BASED ON WOMEN'S MUSCULOSKELETAL PHYSIOLOGY

O. De Matos[1]

[1]PhD, Postgraduate Program in Physical Education and Health, Federal University of Technology, Curitiba, Brazil

There are many measures being used to predict the risk of falls in research and clinical practice, and it is important to investigate the usefulness and consistency of these measures, even if it is to reduce the number of possible risk of falls indicators.

Although our research checks neuromuscular control in older people, our main line is women's health, and in this case we have monitoring from post-menopause to the elderly stage. With menopause, women lose their main protective hormone for protein synthesis, causing a rapid loss of bone and muscle mass due to low estrogen production.

We conclude that for an effective and objective treatment of bone and muscle loss, we need to evaluate the 3 phases of anabolism for these tissues, which are: the dietary profile, absorption capacity and nutrient fixation. Thus, I will have the opportunity to present at the congress how all these aspects are interconnected in a single project.

Topics:

- Population-ageing;
- Falls and expenses;
- Primary health care;
- Importance of musculoskeletal analysis since menopause;
- Physiological phases of anabolism: ingestion, absorption and fixation;

NSS60
DEVELOPMENT OF A FALL RISK ASSESSMENT PROTOCOL BASED ON MUSCULOSKELETAL AND COMPREHENSIVE ASSESSMENT: PROTOCOLS AND MAIN RESULTS

B. Lenardt[1]

[1]Professor and Master degree Student in Postgraduate Program in Physical Education and Health, Federal University of Technology, Curitiba, Brazil

Along these lines, our study analyzed variables associated with the risk of falls, mainly aspects of physical performance. Thus, the objective of the project is to develop the protocol to assess the risk of falls and fractures in frail elderly women. The protocol consists of evaluating the association of sleep disorders, history of falls, physical performance and body composition with bone mineral density to verify the conditions in which women can fall, especially at home, and promote early diagnosis as the main care for health. We are working with several validated tools to assess falls and sleep disorders and after statistical analysis and a pilot program, we developed a new

model with short questions and tests to be applied more easily in the Health Units of our province.

Topics:

- Research and objectives;
- Assessment protocols for risk of falls and fractures, sarcopenia, fragility and sleep disorders;
- Short protocol for risk of falls;
- Outcomes found.

NSS61
THE PRINCIPLES OF OSTEOGENIC LOADING

K. Brooke-Wavell[1]

[1]Human Physiology, School of Sport, Exercise and Health Sciences, Loughborough University, Loughborough, United Kingdom

It is well known that bone responds to mechanical loading by losing mass when unloaded and increasing mass when chronically overloaded. Mechanical loading is typically applied through exercise but not all types of exercise have been found to be effective. Preclinical studies have demonstrated that the degree of bone response is highly dependent on the characteristics of strain generated within bone in response to applied forces. These specific load parameters must be considered if the goal is to formulate an effective exercise prescription. The current talk will present evidence from animal and well-controlled human studies, that report the influence of loading parameters such as strain magnitude, strain rate, cycle number, rest, load frequency and load duration on the bone response to loading.

NSS62
TRANSLATION OF OSTEOGENIC PRINCIPLES INTO EFFECTIVE EXERCISE PRESCRIPTION

B. Beck[1]

[1]Musculoskeletal Anatomy, School of Health Sciences and Social Work, Griffith University and The Bone Clinic, Queensland, Australia

In many parts of the world, exercise continues to be considered merely an ancillary strategy for the management of osteoporosis. The four clear reasons for this scepticism are: 1. generic exercise interventions do not provide a notably effective stimulus in comparison to medications, 2. some patients are reluctant to exercise, 3. GPs don't receive adequate training in exercise prescription, and 4. a perception that exercise is not safe for people with weak bones. As it happens, those concerns can be easily managed. We have demonstrated in rigorous clinical trials that brief, high intensity resistance and impact training (HiRIT) exercise improves bone, muscle and function (all risk factors for fracture) in older women and men with low bone mass without incurring injury. Furthermore, growing evidence from clinical practice has moved bone-targeted exercise, from an ancillary strategy in the management of osteoporosis, to front-line therapy central to patient care.

NSS63
KNOWLEDGE, RISK PERCEPTION, AND IMPACT ON ENGAGEMENT IN THE PREVENTION OF MUSCULOSKELETAL DISEASES—THE FOCUS GROUP OF VITAMIN D

F. Kamberi[1,2], J. Jaho[1], T. Kokuri[3]

[1]Scientific Research Centre for Public Health, University of Vlore "Ismail Qemali", Vlore, Albania, [2]Member of Technical Advisory Group on RCCEIM at WHO Regional Office for Europe, Copenhagen, Denmark, [3]Charité-Universitätsmedizin, Berlin, Germany

Objective: The goal was to assess women's risk perceptions for musculoskeletal diseases based on their levels of vitamin D, knowledge, and awareness.

Material and methods: A focus group composed of 14 women who work indoors was conducted in June 2023. The serum levels of vitamin D were assessed, and a discussion in relation to vitamin D knowledge and risk perception for musculoskeletal diseases was held on the premises of the Scientific Research Centre for Public Health, Albania. All the participants gave their informed written consent to be part of the study.

Results: All participants were women, age $\geq$ 35, with 10 academic medical staff and 4 administrative staff. The mean levels in serum vitamin D were 16.78 $\pm$ 9.21 with an average BMI of 25.64 $\pm$ 4.38. Half of the participants did not go out with sun cream protection and had frequently rhinitis. 65% of participants experienced continued musculoskeletal pain and fatigue. Meanwhile, more than half of the participants had mood swings, depression, or sleep problems, as well as hair loss. Low risk perception and engagement in prevention in relation to musculoskeletal diseases were found.

Conclusions: To effectively prevent and manage musculoskeletal diseases, health education and prevention efforts should be tailored to specific target groups based on their health literacy level and access to reliable and scientific information sources.

Keywords: Vitamin D, knowledge, risk perception, engagement, target groups.

NSS64
SELF-EDUCATION IN CHRONIC PATIENTS WITH MUSCULOSKELETAL CONDITIONS

D. Mio[1,2]

[1]University of Belgrade, Belgrade, Serbia, [2]Health Journalist, Tirana, Albania

Objectives: To provide an overview of the impact of self-education on patient outcomes, the role of digital health tools in facilitating learning, and the importance of personalized self-management education plans in catering to the unique needs of individuals with chronic musculoskeletal conditions.

Material and methods: Through exploring and searching for articles on databases like PubMed and Google Scholar, using keywords like patient education and chronic musculoskeletal conditions," a database of selected articles was created, and a reference list was compiled.

Results: Findings reveal that successful self-education initiatives often incorporate a multidimensional approach, integrating educational resources, peer support, and healthcare professionals' guidance. Furthermore, data from patient intervention programs indicates a substantial impact on self-management skills following educational initiatives.

Conclusions: The positive impact on health literacy, self-management skills, and psychosocial well-being emphasizes the need for healthcare providers to prioritize educational interventions in the care continuum for individuals with chronic musculoskeletal conditions. Future research should continue to explore innovative educational approaches, ensuring a tailored and data-driven strategy for optimal patient outcomes.

Keywords: self-education, chronic patients, musculoskeletal conditions.

NSS65
PHYSIOTHERAPY IN OSTEOPOROSIS. PRACTICE BEHAVIORS AND PHYSIOTHERAPISTS' PERCEPTIONS IN ALBANIA

S. Sinaj[1], F. Kamberi[2], V. Ndreu[1]

[1]Faculty of Technical Medical Sciences, University of Medicine Tirana, Tirana, Albania, [2]Scientific Research Centre for Public Health, University of Vlore "Ismail Qemali", Vlore, Albania

Objective: This study's objective was to investigate the most common treatment modalities used by a random sample of physiotherapists practicing in Tirana for individuals with osteoporosis. Assess whether physical therapists have concerns about the use of manual therapy in individuals with osteoporosis, particularly fractures, as a complication of treatment.
Material and methods: This cross-sectional study included 104 physiotherapists in Tirana, Albania. The physiotherapists were evaluated using a questionnaire developed by the Albanian Association of Physical Therapists. Physiotherapists incorporated the osteoporosis treatment modality and the osteoporosis knowledge assessment test (OKAT).
Results: The questionnaire was completed by 97 physiotherapists. The percentage of reaction was 93% (97/104). The majority of the physiotherapists in the study (93%) used therapeutic exercises and posture re-education; only 15% used manual therapy. Ninety-five percent of respondents expressed reservations about using manual treatment. The most often reported issues were vertebral fractures and rib fractures.
Conclusions: According to the research, the majority of physiotherapists in Albania employ evidence-based approaches when treating persons with osteoporosis, whereas a tiny number use manual treatment and are concerned about its use. Fractures, particularly vertebral fractures, are of special concern to physiotherapists, although injury to other musculoskeletal tissues is also a worry. Manual treatment safety and effectiveness studies in this population are needed to guide therapeutic practice.
Keywords: Osteoporosis, therapeutic exercises, manual therapy, fracture.

NSS66
EVALUATION OF KNOWLEDGE ON THE IMPACT OF VITAMIN D ON OSTEOARTHRITIS

G. Sinanaj[1]

[1]Scientific Research Centre for Public Health, University of Vlore "Ismail Qemali", Vlore, Albania

Objective: This review study aims to provide an overview of studies that present the evaluation of knowledge on the influence of vitamin D on osteoarthritis.
Material and methods: This is a literature review that includes research conducted in the Google Scholar, PubMed, and Medline databases. Respecting the inclusion criteria, 27 articles were reviewed.
Results: The data show that the effect of vitamin D varies depending on the disease state; nevertheless, little is known about its role in the onset and progression of OA. Clinical data show that vitamin D has a minimal protective effect on cartilage volume loss or radiologic OA beginning, while it may have a preventative effect on joint discomfort. Vitamin D deficiency is a risk factor for increased knee osteoarthritis progression, and patients with knee osteoarthritis may benefit from increased appropriate dietary consumption. Vitamin D supplementation could be a safe technique to treat and prevent OA, but further research is needed to pinpoint the exact mechanism and final efficacy.
Conclusions: Vitamin D is important not only for bone health but also for general health.
Keywords: vitamin D, impact, osteoarthritis.

NSS67
PRIMARY HYPERPARATHYROIDISM. ETIOLOGY AND CLINICAL MANIFESTATIONS

I. Kostoglou-Athanassiou[1]

[1]Department of Endocrinology, Diabetes and Metabolism, Asclepeion Hospital, Voula,, Athens, Greece

Primary hyperparathyroidism (PHPT) is a common endocrinologic disorder. It leads to chronically elevated levels of serum calcium, decreased phosphate and increased parathyroid hormone concentrations. The disorder may be due either to the presence of one or more than one adenomas in the area of the parathyroid glands or to diffuse hyperplasia of the parathyroid glands. Parathyroid adenomas may also be ectopically located, mainly in the upper mediastinum. In earlier years PHPT was diagnosed late in the course of the disease when the renal and osseous manifestations of the disease were already present. Nowadays, the disease is diagnosed early in the course of the disease due to the measurement of calcium during routine biochemical evaluation. In many cases PHPT is diagnosed when it presents with minimal or no symptoms. PHPT may also present with normal calcium levels and inappropriately elevated levels of PTH. Following the diagnosis of PHPT localization of the parathyroid adenoma is performed by ultrasonography and scintigraphy. Management of primary PHPT is either medical with the use of calcimimetics or by surgery. The calcimimetic cinacalcet decreases calcium and parathyroid hormone levels. However, surgery is the only treatment with permanent results.

NSS68
PRIMARY HYPERPARATHYROIDISM AND PSYCHOLOGICAL IMPLICATIONS

Y. Athanassiou[1]

[1]Trinity College, Dublin, Ireland

Hypercalcemia associated with primary hyperparathyroidism is linked to mild neurologic alterations, such as personality change and depression. Severe hypercalcemia may result in confusion, psychosis, coma and in serious cases death. Neurologic and behavioral symptoms in patients with primary hyperparathyroidism were described early in the course of the in depth study of hyperparathyroidism. These symptoms were loss of energy, depression, disorentiation, memory problems. Later on it was observed that after successful surgery for the treatment of primary hyperparathyroidism neural and psychiatric symptoms improved. In conclusion, primary hyperparathyroidism is associated with neural, cognitive and psychiatric symptoms which improve after successful treatment of the disease. Main symptom of the disease, observed in most of the patients is depression.

NSS69
PRIMARY HYPERPARATHYROIDISM AND MUSCULAR MANIFESTATIONS

L. Athanassiou[1]

[1]Department of Rheumatology, Asclepeion Hospital, Voula, Athens, Greece.

Primary hyperparathyroidism was once considered a rare disorder. Patients were diagnosed in late stages of the disease with severe manifestations, such as osteitis fibrosa cystica or kindey stones. Nowadays many patients are diagnosed each year due to the availability of serum calcium measurement in the routine biochemical examination. Consequently, many patients are diagnosed in early stages of the disease with minimal serum calcium elevation and minimal or absence of symptoms. However, when the disease presents with obvious symptoms muscle weakness is observed in many patients. Muscle weakness usually improves after successful surgical treatment of the disease.

NSS70
PRIMARY HYPERPARATHYROIDISM AND OSTEOPOROSIS. THE ROLE OF EXERCISE

Y. Dionyssiotis[1]

[1]Spinal Cord Injury Unit, University of Patras, Patras, Greece

Primary hyperparathyroidism is associated with the development of osteoporosis. Patients present with low bone mass and subsequently low bone mineral density. Osteoporosis in the context of primary hyperparathyroidism affects mainly the axial skeleton and the risk of fracture is increased. Successful treatment of the disease, mainly surgical, results in improvement of bone mass and bone mineral density. As primary hyperparathyroidism affects all aspects of skeletal health, patients may benefit greatly from exercise. Exercise should be mild, as an increased risk of fracture exists. Exercise should be performed under guidance from physical therapy specialists. After successful treatment of the disease, exercise may accelerate bone mass improvement. In addition, exercise may improve quality of life in primary hyperparathyroidism as it improves general health, skeletal health and depression.

NSS71
PRIMARY HYPERPARATHYROIDISM AND OSTEOPOROSIS. MANAGEMENT

P. Athanassiou[1]

[1]Department of Rheumatology, St. Paul's Hospital, Thessaloniki, Greece

Primary hyperparathyroidism affects all aspects of skeletal health and causes osteoporosis. Osteoporosis in the context of primary hyperparathyroidism preferentially affects the axial skeleton. Osteoporosis increases the risk of fractures. Successful surgical treatment of primary hyperparathyroidism leads to bone mineral density improvement. In cases of primary hyperparathyroidism, when surgery is not indicated, such as in cases of parathyroid hyperplasia, alendronate may be used as it improves bone mass and osteoporosis and decreases calcium levels. The effervescent form of alendronate may also be successfully applied in cases of primary hyperparathyroidism. In cases of severe primary hyperparathyroidism, osteoporosis should be dealt with in order to improve bone health and decrease fracture risk.

NSS72
LONG-TERM TREATMENT OF OSTEOPOROSIS: WHAT'S UP ON 10-YEARS AFTER

G. Altamar-Canales[1,2,3]

[1]Professor of Geriatrics in Valley University, Cali, Colombia, [2]President of Colombian Osteoporosis Association-ACOMM, Bogota, Colombia, [3]Specialist in Internal Medicine and Geriatrics, Cali, Colombia

Registry trials for the bisphosphonates (BP) alendronate (ALE), risedronate (RIS), ibandronate (IBA) and zoledronic acid (ZOL); showed fracture risk reduction after 3 to 4 years of treatment. These trials were further extended to investigate long-term effects of BP treatment. The extension trials used bone mineral density (BMD) as a primary endpoint and fractures were considered adverse events or followed as exploratory endpoints. BP treatment showed fracture risk reduction and BMD gain. ALE and ZOL trials showed reductions on vertebral fracture risk after 10 and 9 years, respectively[1,2]. When BP therapy lasts 10 or more years, drug holidays may be considered[3]. Even considering rare adverse events like atypical femur fractures and osteonecrosis of the jaw, BP use is safe and effective throughout the years; with increased BMD and fracture risk reductions[4]. Denosumab (DMAB) is a monoclonal antibody and reduces fracture risk at 10 years of follow-up[5]. BMD was increased and new vertebral, hip, and nonvertebral fractures remained low on DMAB with continued BMD improvements over time[6]. Anabolic agents (teriparatide[7], abaloparatide[8], and romosozumab[8]) also reduce nonvertebral and vertebral fractures maybe in greater extent than anti-resorptives[9]. Anabolic medications will not be addressed because there is no available data beyond 5 years of treatment with these drugs.

References

1. Schwartz AV, Bauer DC, Cummings SR, et al. Efficacy of continued alendronate for fractures in women with and without prevalent vertebral fracture: the FLEX trial. J Bone Miner Res. 2010.
2. Black DM, Reid IR, Cauley JA, et al. The effect of 6 versus 9 years of zoledronic acid treatment in osteoporosis: a randomized second extension to the HORIZON-Pivotal Fracture Trial (PFT). J Bone Miner 2014.
3. Gehrke B, Alves Coelho MC, Brasil d'Alva C, Madeira M. Long-term consequences of osteoporosis therapy with bisphosphonates. Arch Endocrinol Metab. 2023.
4. Eastell R, Rosen CJ, Black DM, Cheung AM, Murad MH, Shoback D. Pharmacological Management of Osteoporosis in Postmenopausal Women: An Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metab 2019.
5. Bone H and cols. 10 years of denosumab treatment in postmenopausal women with osteoporosis: results from the phase 3 randomised FREEDOM trial and open-label extension. Lancet Diabetes Endocrinol 2017; 5: 513–23.
6. Kendler D and cols. Denosumab in the Treatment of Osteoporosis: 10 Years Later: A Narrative Review, Adv Ther 2022;39:58–74
7. Miller PD, Lewiecki EM, Krohn K, Schwartz E. Teriparatide: Label changes and identifying patients for long-term use. Cleve Clin J Med. 2021 1;88(9):489–493.
8. Shoback D, Rosen CJ, Black DM, Cheung AM, Murad MH, Eastell R. Pharmacological Management of Osteoporosis in Postmenopausal Women: An Endocrine Society Guideline Update. J Clin Endocrinol Metab. 2020
9. Cosman F. Anabolic Therapy and Optimal Treatment Sequences for Patients With Osteoporosis at High Risk for Fracture. Endocr Pract. 2020;26(7):777–86.

NSS73
DISCONTINUATION OF ANTI-OSTEOPOROSIS TREATMENTS: SHOULD WE DO IT, WHEN AND HOW

A. Medina-Orjuela[1,2]

[1]Assistant Professor Universidad Nacional de Colombia, Bogota, Colombia, [2]Endocrinologist, Hospital San José, San José, Colombia

Long-term bisphosphonate (BP) treatment has been associated with atypical femur fractures (AFF) and osteonecrosis of the jaw (ONJ).[1] Anti-resorptive effect of BP lasts beyond it's period of use due to it's strong binding to calcium ions. BP drug holiday concept aims to maintain a long-length fragility fracture reduction with minimum AFF risk. BP drug holidays may be considered at 3 to 5 years of treatment[2]. Between nitrogen-containing BPs; Zoledronic acid (ZOL) has conferred the most durable reduction in fractures, particularly after 06 infusions[2]. Besides BP' long-lasting properties, anti-resorption effect tend to cease progressively over BP drug holidays. A single dose of ZOL 5 mg and 5-yearly doses of 1.0 and 2.5 mg ZOL prevented bone loss at hip and spine for 8 to 10 years in older postmenopausal women.[3] Denosumab (DNB) is a monoclonal antibody approved for treatment of osteoporosis in 2010. DNB is an anti-resorptive agent recommended in almost all guidelines worldwide as first-line treatment in pacients at high risk of fractures[4]. DNB discontinuation lead to BMD reduction and higher risk of fracture.[5] Nevertheless, alendronate (ALE), and zoledronic acid (ZOL) mitigated BMD loss.[6] There is some concern also regarding bone anabolic therapy discontinuation. Teriparatide is approved for 18–24 months and antiresorptive treatment may be necessary to maintain densitometric gains achieved during it's use.[7] Patients who received alendronate presented 4.9% gain in lumbar spine BMD vs. placebo group, stressing the importance of following teriparatide therapy with an antiresorptive drug.[8] Besides the need of sequential anti-resorptive use after teriparatide, the fracture prevention persisted for as long as 31 months after teriparatide discontinuation.[9]

1. Hayes KN, Winter EM, Cadarette SM, Burden AM. Duration of Bisphosphonate Drug Holidays in Osteoporosis Patients: A Narrative Review of the Evidence and Considerations for Decision-Making. J Clin Med. 2021 Mar 9;10(5):1140. https://doi.org/10.3390/jcm10051140. PMID: 33803095; PMCID: PMC7963175.
2. Wang M, Wu YF, Girgis CM. Bisphosphonate Drug Holidays: Evidence From Clinical Trials and Real-World Studies. JBMR Plus. 2022 May 24;6(6):e10629. https://doi.org/10.1002/jbm4.10629. PMID: 35720669; PMCID: PMC9189912.
3. Grey, A., Bolland, M.J., Horne, A., Mihov, B., Gamble, G. and Reid, I.R. (2022), Bone Mineral Density and Bone Turnover 10 Years After a Single 5 mg Dose or Two 5-Yearly Lower Doses of Zoledronate in Osteopenic Older Women: An Open-Label Extension of a Randomized Controlled Trial. J Bone Miner Res, 37: 3–11.
4. Kendler DL, Cosman F, Stad RK, Ferrari S. Denosumab in the Treatment of Osteoporosis: 10 Years Later: A Narrative Review. Adv Ther. 2022 Jan;39(1):58–74. https://doi.org/10.1007/s12325-021-01936-y. Epub 2021 Nov 11. PMID: 34762286; PMCID: PMC8799550.
5. Tay WL, Tay D. Discontinuing Denosumab: Can It Be Done Safely? A Review of the Literature. Endocrinol Metab (Seoul). 2022 Apr;37(2):183–194. https://doi.org/10.3803/EnM.2021.1369. Epub 2022 Apr 14. PMID: 35417954; PMCID: PMC9081316
6. Tutaworn T, Nieves JW, Wang Z, Levin JE, Yoo JE, Lane JM. Bone loss after denosumab discontinuation is prevented by alendronate and zoledronic acid but not risedronate: a retrospective study. Osteoporos Int. 2023 Mar;34(3):573–584. https://doi.org/10.1007/s00198-022-06648-9. Epub 2023 Jan 5. PMID: 36602607; PMCID: PMC9813893
7. Hassan N, Gregson CL, Tobias JH. Anabolic treatments for osteoporosis in postmenopausal women. Fac Rev. 2021 May 5;10:44. https://doi.org/10.12703/r/10-44. PMID: 34131654; PMCID: PMC8170684.
8. Black DM, Bilezikian JP, Ensrud KE, Greenspan SL, Palermo L, Hue T, et al. One year of alendronate after one year of parathyroid hormone (1–84) for osteoporosis. N Engl J Med 2005;353(6):555–65.
9. Lindsay R, Scheele WH, Neer R, Pohl G, Adami S, Mau- talen C, et al. Sustained vertebral fracture risk reduction after withdrawal of teriparatide in postmenopausal women with osteoporosis. Arch Intern Med 2004;164(18):2024–30.

NSS74
RECOMMENDATIONS FOR OSTEOPOROSIS TREATMENTS BEYOND 10 YEARS

A. F. Coy Barrera[1]

[1]Internist-Endocrinologist, Fundación Santa Fé, Bogota, Colombia

As life expectancy expands, women are progressively more exposed to longer hypoestrogenic state and postmenopausal bone loss. Considering that the risk of osteoporosis lasts for the whole life, sequential management of osteoporosis medications frequently needed. Sequential therapy options are increasingly being addressed in clinical trials more often than combination therapies, with the first results showing benefits for the maintenance of stable BMD increases and fracture risk reduction. Hormone replacement therapy (estrogen, tibolone) and selective estrogen receptor modulators (raloxifene) help on postponing bisphosphonate (BP) therapy and is considered an early intervention on the management of postmenopausal osteoporosis. When the use of these agents is not posible, the choice is an oral BP. For patients at high risk of an osteoporotic fracture, oral bisphosphonates (BP) can be used. But, If the patient is considered at very high (or iminent) risk of fracture, oral BP shall be substituted by intravenous, and denosumab or bone anabolic agents (teriparatide, abaloparatide, romosozumab) may be an option. Anabolics like teriparatide, abaloparatide and romosozumab; or Denosumab shall be followed by a subsequent antiresorptive treatment. Regardless of the strategy adopted, follow-up should be maintained indefinitely to help prevent fractures. Dental hygiene should be emphasized given that most of the cases of ONJ were related to tooth extractions. The patient should have regular medical appointments to check BMD, calcium and vitamin D levels, along with keeping vitamin D and calcium supplementation. Bone turnover markers help monitor treatment response and shall be chosen accordingly to the drug mechanism of action.

References:

1. Calaf-Alsina J, Cano A, Guañabens N, Palacios S, Cancelo MJ, Castelo-Branco C, Larrainzar-Garijo R, Neyro JL, Nogues X, Diez-Perez A. Sequential management of postmenopausal health and osteoporosis: An update. Maturitas 2023;177:107846
2. Händel MN, Cardoso I, von Bülow C, Rohde JF, Ussing A, Nielsen SM, Langdahl B, Abrahamsen B et al. Fracture risk reduction and safety by osteoporosis treatment compared with placebo or active comparator in postmenopausal women: systematic review, network meta-analysis, and meta-regression analysis of randomised clinical trials. BMJ. 2023.

3. Foessl, I., Dimai, H.P. & Obermayer-Pietsch, B. Long-term and sequential treatment for osteoporosis. Nat Rev Endocrinol 2023;19:520–533.
4. Gehrke B, Alves Coelho MC, Brasil d'Alva C, Madeira M. Long-term consequences of osteoporosis therapy with bisphosphonates. Arch Endocrinol Metab 2023

NSS75
CHRONIC ARTHRITIDES AND BONE

H. G. Raterman[1]

[1]Rheumatologist Northwest Clinics, Amsterdam, Netherlands

Patients with inflammatory rheumatic diseases suffer from loss of bone quality and density. Underlying inflammatory processes of the IRDs have a negative influence on bone (i.e. bone loss and bone quality). As IRDs patients have an elevated fracture risk there is urgent need to prevent further loss of quality of life due to the ongoing due to the ongoing inflammation and bone loss.

Historically, patients with IRDs were treated with high doses of glucocorticoids, but nowadays there is a wide variety in treatment modalities influencing different targets in the inflammatory cascade of IRD patients. The main goal of treating IRDs like rheumatoid arthritis is to prevent structural damage by pivotal disease modifying anti-rheumatic drugs (DMARDs). Optimal treatment with antirheumatic drugs in IRDs may improve bone quality and density by counteracting the negative effects of inflammatory processes on bone in these patients.

In this lecture the influence of inflammation on bone loss will be discussed. Moreover, the potential positive effects on bone of conventional and biological antirheumatic drugs in IRDs will be highlighted.

NSS76
VITAMIN D IN PATIENTS WITH INFLAMMATORY RHEUMATIC DISEASES

W. Lems[1]

[1]Rheumatologist, Amsterdam UMC, Amsterdam, Netherlands

There are 4 reasons why adequate vitamin D levels are crucial for patients with inflammatory rheumatic diseases (IRDs) such as rheumatoid arthritis, spondyloarthropaties including psoriatic arthritis and SLE. Suboptimal treated with antirheumatic drugs in IRDs are associated with muscular weakness and bone loss /fractures, suboptimal or deficient vitamin D levels elevates fracture risks even further. Suboptimal treated with anti rheumatic drugs in IRDs may induce immobility and thus lack of sunshine, this also elevates fracture risks. Patients with SLE should avoid sunshine because of the sensitivity of their skin for sunshine, this may also elevate even further. Interestingly, basic studies suggest that active vitamin D reduces inflammatory processes.

All these 4 topics will be discussed ending with the statement (to be discussed) that clinicians should measure serum VitD levels in their patients with IRDs and, when in lower range or deficient, correct them into normal, or preferably in upper normal range.

NSS77
FIBROMYALGIA AND BONE

O. D. Messina[1]

[1]Rheumatologist, IRO Medical Research Centre, Buenos Aires, Argentina

Fibromyalgia (FM) is characterized by widespread musculoskeletal pain and tenderness with associated symptoms related to central sensitization syndrome (CSS) such as fatigue, unrefreshing sleep, cognitive dysfunction, anxiety and depression. Relationship between osteoporosis (OP) and FM showed mixed results, and was not fully studied in well designed controlled studies.

Rationale to link FM with OP and VitD disorders are related to low mobility, sedentary lifestyle, low sun exposure, probably sarcopenia and an increased trend to falls and fractures among patients with FM. Lichtenstein et al. conducted a case control study in Israel comparing FM patients and age matched controls and found a significant correlation between FM and OP (correlation coefficient 0.55 $P < 0.001$). A logistic regression for OP showed an odd ratio of 1.94 (95% CI, 1.83–2.06 $P < 0.001$) for FM compared to controls but not with fractures. The mean serum of IL-6 was significantly higher in patients with FM and low VitD levels in comparison with patients with FM and normal VitD levels. This study included 14,296 FM patients and 71,324 age and sex matched controls. Among FM patients 2424 (17%) were found to have OP vs 8592 (12%) among controls (correlation coefficient 0.55, $P < 0.001$). Higher BMI was the only protective parameter among patients with FM. Some meta analysis showed low levels of Vitamin D among patients with FM vs controls and a correlation between low levels of Vitamin D and FM severity measured by FIQ and clinical variables.

Epidemiological studies about sarcopenia and fractures in patient with FM are clearly lacking and are strongly warranted.

NSS78
SCOPE OF THE PROBLEM: BEYOND THE FEMALE ATHLETE TRIAD

S. Tuzun[1]

[1]Professor of Physical Medicine and Rehabilitation, Istanbul University, Cerrahpasa School of Medicine, Istanbul, Turkiye

Understanding and addressing bone health in athletes encompasses a blend of science, art and medicine. Excessive exercising in young women causes a risk for developing the Female Athlete Triad as a result of inadequate energy intake, which is called low energy availability (LEA). Although the literature on LEA has focused on female athletes, it has also been reported in male athletes. However, prevalence of LEA in male athletes is lower, and occurs among the same at risk sports as for female athletes: the weight sensitive sports in which leanness and/or weight are important due to their role in performance. In case of an imbalance between exercise and nutrition as seen in female /male athlete triad, bone mass is compromised and this can lead to stress fractures.

LEA in combination with Functional Hypothalamic Amenorrhea can occur from severe energy restriction, or increased energy expenditure. In females of reproductive age engaging in excessive exercise, the result may be menstrual cycle disorders when there is relative caloric deficiency due to inadequate nutritional intake for the amount of energy expended. Risk for low BMD is increased four times if body weight is below 85% of ideal body weight.

Estrogen deficiency is responsible for low bone mass. Amenorrheic athletes have lower BMD than eumenorrheic athletes, particularly at the lumbar spine. Stress fractures, occur at a much higher frequency in patients with exercise-induced amenorrhea. Repeated stress fractures

occur in up to 30% of ballet dancers and 32% of runners. They are more common in athletes with eating disorders. This is caused by low bone mass and the low-energy state, which leads to low bone turnover and/or favors a resorptive state. Bone loss is one of the most challenging issue in the management of low energy availability since reverse of it takes a longer than other symptoms like lack of energy and menstrual dysfunction. Although some recovery is possible, it is not clear if complete restoration is possible to return bone health equal to that of menstruating exercising women.

NSS79
ASSESSMENT OF BONE STRENGTH IN ATHLETES

J. J. Carey[1]

[1]Professor in Medicine, University of Galway, Galway, Ireland

Elite athletes are not normal people so the assessment of bone health in sports medicine is complex. Extreme body phsiques and performance put the musculoskeletal system under extreme stress. Poor bone health or excessive strain can have devastating consequences, and can be career ending for elite athletes, while good bone health is also essential for past or occasional athletes for general health and well-being. The importance of bone health assessments has gained greater recognition, while the identification of those at risk and the definition of normal is evolving. During this presentation Professor Carey will discuss the importance of central DXA and other methods to assess bone health in sports medicine, and how interpretation of results may differ between elite and past or occasional athletes.

NSS80
HOW REMS CAN BE HELPFUL TO ASSESS BONE IN SPORTS MEDICINE?

R. Matijevic[1,2]

[1]University of Novid Sad, Faculty of Medicine in Novi Sad, Novi Sad, Serbia, [2]Orthopaedic and Trauma Clinic, Clinical Center of Vojvodina, Vojvodina, Serbia

Radiofrequency echographic multispectrometry (REM) represents a cutting-edge technology with promising applications in sports medicine, particularly for assessing bone health. REMS is a non-ionizing technology that evaluates bone status by analysing raw, unfiltered native ultrasound signals, so-called radio frequency ultrasound signals, obtained during an ultrasound scan of the lumbar vertebrae and proximal femur. The analysis of native unfiltered ultrasound signals allows for information about the characteristics of bone tissue to be acquired.

REM allows early detection of microstructural changes in bones, such as stress fractures or microdamage, which are common in athletes due to repetitive stress and high-impact activities. Unlike conventional imaging techniques like X-rays, REM provides a more objective assessment of bone quality by analysing the bone's composition and architecture. This enables sports medicine practitioners to accurately gauge bone strength and resilience, crucial for injury prevention and performance optimization. Injuries like fractures are prevalent in sports, and monitoring bone healing is essential for athletes to safely return to play. It also offers a dynamic method to track the progress of bone healing over time, allowing healthcare professionals to adjust treatment protocols as needed and ensure optimal recovery.

By understanding each athlete's bone composition and structure, healthcare providers can tailor rehabilitation programs and training strategies to address specific needs and minimize the risk of reinjury. This quantitative approach facilitates longitudinal monitoring of bone changes and the evaluation of treatment efficacy over time. REM contributes to ongoing research in sports medicine by advancing our understanding of bone physiology and response to mechanical loading. By elucidating the underlying mechanisms of bone adaptation and injury, REM supports the development of novel interventions and preventive strategies for athletes.

NSS81
HOW TO MANAGE BONE LOSS IN ATHLETES?

R. Terlemez[1]

[1]İstanbul University-Cerrahpaşa, Cerrahpaşa Medical Faculty, Physical Medicine and Rehabilitation, Istanbul, Turkiye

Low energy availability, frequently results in hypoestrogenism and menstrual disruption, which have detrimental impacts on bone health and endothelial cell dysfunction. Athletes with unstable menstruation and/or low bone mineral density (BMD) are more likely to sustain bone stress injuries. Compared to eumenorrheic subjects, athletes with amenorrhea are two to four times more likely to experience a stress fracture.

Weightbearing activity was found to have a considerable effect on BMD, with site specific mechanical loading having a major impact on bone accretion. Both amenorrheic and eumenorrheic athletes had larger total cross-sectional area, trabecular area, and cortical perimeter at the distal tibia than non-athletes. Athletes with low BMD should modify their exercise to include weight training and/or cutting and jumping sports. A good balance between exercise and nutrition, as well as proper intake of calcium and vitamin D, are essential to avoid osteoporosis and bone stress injuries. Lower BMD and stress injuries are linked to the Triad's constituent parts. Therefore, after a stress injury has been recognized, evaluating and treating risk factors that may have an adverse effect on bone health should be a component of the treatment approach. Improving the already compromised bone health requires raising energy availability to prevent the inhibition of growth factors, reproductive hormones, and other vital hormones. Amenorrheic athletes have been found to enhance their BMD more with the resumption of their menses and weight gain.

Young athletes with significant bone loss have limited pharmacologic options. Oral contraceptive pills (OCPs) are frequently prescribed for athletes despite not being the recommended first line treatment. The studies on the effect of OCPs and bone health remain mixed and are frequently confounded by weight gain, which is known to improve BMD. Bisphosphonates use, in reproductive age has a potential teratogenic affect, since almost all of these medications have long half lives and are bound to the bone for years. In future, leptin hormone may have a role in the treatment of low BMD in athletes.

NSS82
QUALITATIVE ASPECTS OF PLATELET-RICH PLASMA INJECTIONS

J.-F. Kaux[1]

[1]MD, PhD, Physical and Rehabilitation Medicine Department, University and University Hospital of Liège, Liège, Belgium

Platelet-rich plasma (PRP) holds promise as a therapeutic agent due to its high concentration of platelets and growth factors. Its widespread use, especially in treating tendinopathies or osteoarthritis among athletes, is notable. However, scientific consensus regarding its efficacy remains elusive, partly due to variations in PRP preparation methods. This literature review examines key parameters affecting PRP quality, including anticoagulant selection, centrifugation speed, platelet concentrations, blood cell ratios, platelet activators, and the use of local anesthetics during infiltration. Additionally, exploring variables like ultrasound guidance during injections could offer further insights into optimizing PRP's therapeutic potential.

NSS83
NERVE ANAESTHESIA FOR PAINFUL PLATELET-RICH PLASMA INJECTION

L. Chimot[1]

[1]MD, CNAES, Clinique Brétéché, Nantes, France

Efficiency of PRP is conditioned by several factors. One of those described is the necessity to avoid local anaesthesia. Being sensitive to pH environment, platelets could be destroyed by the presence of these medications which have low pH. Unfortunately, intra-tendinous injection is a strongly painful procedure. There are some technic to attempt to deal with this problem. One of them is to provide regional anaesthesia which consists to stop the stimulation of the nerve which covers the sensitive territory of the tendon. To perform this anaesthesia, a number of issues must be addressed: nerve territory anatomy, available medications and their properties, patient consigns.

We would try to bring the necessary background to understand the concept of regional anaesthesia and to choose the best technic to obtain a no pain procedure.

NSS84
POST-PROCEDURE AFTER PLATELET-RICH PLASMA INJECTION FOR A TENDINOPATHY

M. Lamontagne[1]

[1]MD, PhD, Physical Medicine Department, University of Montreal Health Center, Montreal, Canada

After an intratendinous platelets rich plasma (PRP) injection, management and recommendations vary greatly from one physician to another. In the absence of studies comparing two different rehabilitation protocols, it is difficult to propose ideal rehabilitation following these injections. Although there is some consensus in the literature on the post-procedure protocol, the rationale for recommending it remains limited. In this context, we believe that a protocol based on the different phases of connective tissue healing, and on principles of optimized active tendon rehabilitation, using exercises favoring a progressive increase in the mechanical load applied to the tendon, remains the most appropriate approach. This presentation will propose a protocol and recommendations that can be used for the management of a patient after receiving a PRP injection for a tendinopathy.

NSS85
OSTEOPOROSIS AND CARDIOVASCULAR RISK: OLD FRIENDS?

A. Medina[1,2,3,4]

[1]Endocrinologist, Hospital San José, San José, Colombia, [2]Assistant Professor Universidad Nacional de Colombia, Bogota, Colombia, [3]Past President of Colombian Osteoporosis Association-ACOMM, Bogota, Colombia, [4]Member of Regional Board IOF, Bogota, Colombia

Introduction: The link between osteoporosis and cardiovascular disease (CVD) includes shared risk factors, common pathophysiological mechanisms, common genetic factors and a causal association. Osteoporosis and CVD commonly occur in advanced age, but age is not the only factor that is associated.

Results: Both diseases have similar risk factors, including diabetes, smoking, alcohol, sedentary lifestyle, ageing, menopause, and dyslipidemia which may simultaneously promote atherosclerosis and bone demineralization. Studies have shown that low bone mineral density (BMD) is a risk factor for cardiovascular mortality in both women and men. BMD loss at the hip increased mortality 1.3-fold in CVD being a significant predictor of cardiovascular mortality.

Discussion: Common pathophysiological mechanisms involving inflammatory cytokines, endogenous sex hormones, oxidized lipids, vitamin K deficiency, and vitamin D were implicated in the progression of the two conditions. Inflammatory cytokines play a role in all stages of atherogenesis from fatty streak formation to plaque rupture and increasing the resorption leading to bone loss. Osteoporosis and atherosclerosis are characterized by low grade chronic inflammation, therefore, the processes involved in the calcification of atheroma plaque are similar to them in bone remodeling with participation of common proteins in the bone matrix and atheromatous plaques as: osteoprotegerin, osteonectin, osteopontin and type 1 collagen. The mineral composition of calcified atherosclerotic plaques is like hydroxyapatite crystals located in the inorganic bone matrix.
Regarding the hormonal effect, estradiol increases the proliferation of endothelial cells, production of endothelium-derived factors such as nitric oxide and decreases the expression of leukocyte adhesion molecules. In bone, prevents resorption and increases formation. Androgens also seem to have a positive effect on bone and vascular health.

Vitamin K deficiency has been associated to atherosclerotic calcification and low bone mass involving matrix-gla protein and osteocalcin. Deficiency of Vitamin D is associated to CVD mortality. Vitamin D receptor (VDR) polymorphisms contribute to the risk of both osteoporosis and CVD. In end-stage renal disease, secondary hyperparathyroidism was also linked to increased risk for fractures and vascular calcification. Regarding, genetic factors, the Osteoprotegerin, matrix-gla protein, and apolipoprotein E (Apo E) genes have been invoked in both atherogenesis and bone loss.

Finally, the reduced blood flow caused by atherosclerosis, reduces intraosseous blood circulation in the lower extremities, altering bone metabolism in the hip and resulting in osteoporosis. CVD, in turn, might limit physical activity contributing to bone loss.

Conclusion: An understanding of these mechanisms that involve CVD and osteoporosis, will serve as a basis for using common preventive and therapeutic measures targeted at both diseases.

References:

1. Azeez, T.A. Osteoporosis and cardiovascular disease: a review. *Mol Biol Rep*2023; 50:1753–1763
2. Farhat GN, Cauley JA. The link between osteoporosis and cardiovascular disease. Clin Cases Miner Bone Metab. 2008 Jan;5(1):19–34.
3. Warburton DE, Nicol CW, Gatto SN, Bredin SS. Cardiovascular disease and osteoporosis: balancing risk management. Vasc Health Risk Manag. 2007;3(5):673–89.
4. Lello S, Capozzi A, Scambia G. Osteoporosis and cardiovascular disease: an update. Gynecol Endocrinol. 2015;31(8):590–4.
5. Isaia, G., Marchese, L., Marchetti, M., Bo, M. (2018). Osteoporosis and Cardiovascular Risk. In: Lenzi, A., Migliaccio, S. (eds) Multidisciplinary Approach to Osteoporosis. Springer, Cham. https://doi.org/10.1007/978-3-319-75110-8_12

NSS86
OSTEOPOROSIS AND DEMENTIA: WHERE ARE WE GOING?

G. Altamar[1,2,3]

[1]Specialist in Internal Medicine and Geriatrics, Cali, Colombia, [2]Professor of Geriatrics in Valley University, Cali, Colombia, [3]President of Colombian Osteoporosis Association-ACOMM, Bogota, Colombia

Introduction: Low bone mineral density (BMD) share risk factors with dementia, however, remains unclear whether low bone density itself may be causally linked to dementia or vice versa, we will review some associations between osteoporosis and dementia.
Results: Low BMD has been associated with time to Alzheimer's disease (AD) in a Chinese cohort study and all-cause dementia in the Framingham Heart Study (FHS) in women, but not men. Low BMD was also associated with brain structural changes and cognitive performance in FHS. In elderly women, the decline in femoral neck BMD was associated to decline in cognitive screening. Recently, a meta-analysis of baseline BMD showed higher BMD to have a significant protective association with incident dementia and a significant association of risk between prior bone loss and incident dementia in one of the studies implicated.
Discussion: The brain and bones are interconnected. The neurotransmitters affect bone homeostasis and sensory nerve innervation of bone, likewise bone act as an endocrine organ secreting osteocalcin, which impact the production of neurotransmitters affecting cognitive function. Alzheimer's disease (AD) is a neurodegenerative disease with extracellular aggregates of amyloid-beta peptide (Ab) derived from amyloid precursor protein (APP) and the presence of neurofibrillary protein. APP/Ab can directly damage skeletal remodeling by impacting osteoclast differentiation, decrease in osteoblastogenesis and loss of trabecular bone mass. Insufficient Wnt/b-catenin activation is possibly related to bone loss and brain pathology because its signalling contributes to osteoblast differentiation and promotes bone formation, synaptic junctions, and neuronal survival.
Other factors in common are low protein intake and sedentarism lead to reduced muscle strength, reduced bone mechanical strain with consequent accelerated bone loss. Osteosarcopenia is associated with malnutrition, cognitive deterioration, atherosclerosis, frailty, falls and fractures. Fragility fractures lead to consequences in mobility, quality of life, increased morbidity, and mortality in AD patients. Unfortunately, only 5% of hip fracture patients receive appropriate treatment for osteoporosis.

Exercise, prevention of falls and fortified nutrition are beneficial for improve gait, balance, strength, mobility and reduce falls and fractures in the patient with dementia and/or osteoporosis.
Conclusion: In AD, direct factors like amyloid pathology, abnormal brain-bone interconnection, Wnt/b-catenin signaling deficits, low protein intake, sedentarism, are associated to osteoporosis and fractures.

References:

1. Amouzougann A and cols, High prevalence of dementia in women with osteoporosis. Joint Bone Spine 84 (2017) 611–614
2. Haasum Y and cols, Undertreatment of osteoporosis in persons with dementia? A population-based study. Osteoporos Int (2012) 23:1061–1068 https://doi.org/10.1007/s00198-011-1636-8
3. Lary C and cols, Osteoporosis, and dementia: establishing a link. J Bone Miner Res. 2021 November; 36(11): 2103–2105. https://doi.org/10.1002/jbmr.4431.
4. Lary C and cols, Bone mineral density and the risk of incident dementia: A meta-analysis. J Am Geriatr Soc. 2023;1–7. https://doi.org/10.1111/jgs.18638
5. Zhou B-N, Zhang Q and Li M, Alzheimer's disease and its associated risk of bone fractures: a narrative review. Front. Endocrinol. 14:1190762. https://doi.org/10.3389/fendo.2023.1190762

NSS87
TREATMENTS FOR OSTEOPOROSIS AND CARDIOVASCULAR EVENTS: WHAT DO WE KNOW?

A. Román-González[1,2,3]

[1]Specialist in Internal Medicine-Specialist in Endocrinology, Medellin, Colombia, [2]Master in Neuroendocrinal Tumors, Medellin, Colombia, [3]Associate Professor Antioquia University -Hospital San Vicente Fundación, Medellin, Colombia

Introduction: Anti-osteoporosis drugs are commonly used for preventing and treating osteoporosis. However, some of these drugs have been associated with an increased risk of cardiovascular events.
Results: Anti-osteoporosis treatment is composed of two pharmacological groups, antiresorptives and osteoanabolics, the following is the evidence associated with cardiovascular risk.
Antiresorptivestherapies: Bisphosphonates are the most widely used anti-osteoporosis drugs, slow down bone turnover. Some studies suggest an increased risk of atrial fibrillation, though others have not found this association. The overall evidence on the cardiovascular safety of bisphosphonates is mixed. Additionally, zoledronic acid was associated with lower mortality, but a clear explanation for this finding is lacking.
Denosumab, a monoclonal antibody inhibiting RANKL to reduce bone resorption, has conflicting evidence regarding cardiovascular risks. Some studies suggest an increased risk of major adverse cardiovascular events (MACE), while others report neutral effects. Although this side effect appears infrequent, further research is needed. Recent research suggests an increase in mortality. However, this may be explained by type I error.
Osteoanabolictherapies: Romosozumab, a monoclonal antibody inhibiting sclerostin and a newer anti-osteoporosis drug, is more effective than bisphosphonates in reducing fracture risk. However, some studies suggest an increased risk of myocardial infarction and stroke. Heterogeneous evidence exists across basic, clinical, population, and genetic studies, and this side effect seems rare. More research is needed to confirm these findings, and further phase IV studies may provide clarification.
Teriparatide and Abaloparatide, bone-forming agents acting through PTHR or PTHrp-mediated pathways, showed no evidence of increased cardiovascular risk. Some evidence even suggests cardioprotective roles.
Conclusion: The cardiovascular safety of anti-osteoporosis drugs is a complex issue. Evidence on the cardiovascular safety of bisphosphonates is mixed, denosumab may increase the risk of MACE or be neutral, and Romosozumab may increase the risk of myocardial infarction and stroke. On the other hand, PTH analogues seem neutral or even protective. The discontinuation of Odanacatib and findings from Romosozumab trials suggest a common link between osteoporosis mechanisms and cardiovascular risk. However, methodological issues or serendipitous findings may also explain these uncommon side effects. More research is needed to definitively determine the cardiovascular safety of these drugs, and phase IV studies may provide further clarification.

References:

1. Adachi, S., Kameda, T., Tanaka, Y., & Taniyama, T. (2020). Cardiovascular safety of denosumab for postmenopausal

osteoporosis: A meta-analysis of randomized controlled trials. Journal of Bone and Mineral Metabolism, 38(5), 728–738.
2. Amling, M., Pfeifer, C., Samel, L., & Bonewald, L. F. (2023). Cardiovascular effects of anti-osteoporosis drugs: A review of the literature. Current Osteoporosis Reports, 21(1), 1–10.
3. Bone, H. G., Adachi, S., Arisawa, T., & Tanaka, Y. (2022). Cardiovascular safety of romosozumab for the treatment of osteoporosis: A systematic review and meta-analysis. Osteoporosis International, 33(5), 899–911.
4. Papacosta, C., Giaggis, L., & Weitzmann, M. N. (2023). Cardiovascular effects of anti-osteoporosis drugs: What do we know and what do we still need to learn?. Current Drug Safety, 18(9), 933–946.

NSS88
BONE FRAGILITY AND OSTEOPOROSIS IN YOUNG ADULTS

L. Seefried[1]

[1]Orthopedic Department of the University Hospital at the Julius-Maximilians University Würzburg, Germany, Würzburg, Germany

While osteoporosis with progressive aging is a well-established condition with clear-cut diagnostic and therapeutic implications, the management of bone fragility and osteoporosis in younger adults still imposes extensive challenges. Operational definitions of this so early-onset osteoporosis in the age range of 20–50 years by ISCD and IOF both include a low BMD with a Z-score $\leq$ -2.0 or T-score $\leq$ -2.5, respectively, along with a low-trauma fracture or secondary cause of osteoporosis.

In terms of appropriate diagnosis, it is therefore important to cover a wide range of potential secondary causes in order not to miss any specific reasons, which are critical to further guide appropriate management treatment. In addition to medical history, radiographs, biochemical investigations, bone mineral density assessment and a bone biopsy in specific cases, genetic testing should be generously considered to identify potential underlying causes or predisposing factors.

Growing scientific evidence supports the notion that heterozygous alterations in genes otherwise causing recessive monogenic diseases of mild variants in genes associated with dominant skeletal dysplasias play an important role in many patients experiencing osteoporotic manifestations not sufficiently explainable otherwise. Specifically variants in genes related to type I collagen biosynthesis and key regulatory proteins of canonical WNT signaling like LRP5 and WNT1, the X-chromosomally located actin-binding plastin-3 protein (PLS3) and more recently sphingomyelin synthase 2 (SGMS2), critical for signal transduction in sphingomyelin metabolism, have recurrently been identified in such conditions. This also applies to cases of pregnancy and lactation associated osteoporosis.

While treatment is currently taking advantage of compounds established and primarily approved in the context of postmenopausal osteoporosis, a better understanding of the aforementioned monogenic disorders will help to integrate and adopt experiences from the management of these rare disorders to more common cases early onset osteoporosis.

NSS89
ASSESSMENT OF BONE HEALTH IN PREGNANCY

V. A. Degennaro[1], T. Ghi[1]

[1]Department of Medicine and Surgery, Obstetric and Ginecology Unit, university of Parma, Italy, Parma, Italy

Background: Women's bones are subjected to considerable change throughout pregnancy due to the concurrence of several factors. While the higher level of estrogen and vitamin D promote the formation of bone tissue, the fetal uptake of maternal calcium destined to skeletal development leads to maternal bone resorption. Furthermore, some recognized hormonal factors may concur to reduce the mineralization of maternal bone during pregnancy, such us the rise of parathyroid hormone-related protein or progressive increase level of oxytocin which activates the osteoclast and stimulates the calcium transport to the fetus. Moreover, lifestyle may have a negative impact on the bone mass during pregnancy. The physical activity or the sun exposure may be lower than usual in pregnant women, particularly in the third trimester. On this basis, the World Health Organization (WHO) recommends an extra dietary calcium intake of 200 mg/day for pregnant women compared to non-pregnant women. Based on the concomitant effect all of these factors, a net reduction of women's bone mineral density is purported to occur during pregnancy. However, this alleged demineralization of maternal bone during pregnancy has never been demonstrated or quantified due to lack of an appropriate method of BMD assessment which can be safely employed across gestation. Actually, the dual-energy X ray absorptiometry (DEXA), which is still widely considered as the gold standard method in determining the amount of bone loss, is limited by the potential harmful effect of radiation during pregnancy. Recently, an innovative ultrasound-based technique has been introduced in the clinical practice for an accurate assessment of BMD in the central site, such as the femoral neck or the lumbar spine. This method, known as Radiofrequency Echographic Multi Spectrometry (REMS), has been shown to be as reliable as DEXA in the diagnosis of osteoporosis among non-pregnant women.

The aim of the present work is to assess the BMD of the femoral neck by means of Rems technology, to objectify the reduction of BMD in pregnancy.

Methods: A review of the literature on the use of REMS technology in pregnancy was performed.

Results: In this prospective case–control observational study, a non-consecutive group of pregnant women with uncomplicated pregnancy at or $>$ 37 weeks were enrolled. The study subjects were submitted to a sonographic examination of the proximal femur with Radiofrequency Echographic Multi Spectrometry (REMS) technology to quantify the BMD of the femur. The BMD values obtained in the study group were compared with those of a control group of non-pregnant women matched for age, ethnicity and pre-pregnant body mass index (BMI). Overall, 78 pregnant women at 39.1 $\pm$ 1.5 weeks were assessed. Compared with non-pregnant women, the femoral BMD values measured in pregnancy using REMS were significantly lower (0.769 $\pm$ 0.094 g/cm^2 vs 0.831 $\pm$ 0.101 g/cm^2, p = 0.0001) with a mean BMD reduction of 8.1%. The femoral neck BMD presented a positive correlation with the pre-pregnant woman's BMI (p = 0.0004) and a negative correlation with the maternal age (p $<$ 0.0001). In addition, a lower femoral neck BMD in Caucasian ethnicity compared with non-Caucasian was noted (p $<$ 0.0001). In another study, over a period of seven months, a total of 65 participants underwent bone mineral density measurement at the femoral neck at first and third trimester of the pregnancy using REMS. A significant reduction of the bone mineral density at the femoral neck (0.723 $\pm$ 0.069 vs 0.709 $\pm$ 0.069 g/cm^2; p $<$ 0.001) was noted with a mean bone mineral density change of -1.9 $\pm$ 0.6% between the first and third trimester of pregnancy. At multivariable linear regression analysis, none of the demographic or clinical variables of the study population proved to be independently associated with the maternal bone mineral density changes at the femoral neck.

Conclusion: In this review of the literature a decrease BMD in pregnant women has been objectively demonstrated thank to REMS technology which is able to identify and quantify femoral BMD loss non-invasively during pregnancy. Furthermore, REMS technology is a safe and valid approach for monitoring bone health during and after pregnancy. Further studies are needed to promptly identify and follow

up with pregnant women who show transient osteoporosis and or decreased bone density in order to preserve bone health.

NSS90
MANAGEMENT OF BONE FRAGILITY IN PREGNANT WOMEN

M. L. Brandi[1]

[1]Fondazione FIRMO and Observatory for Fragility Fractures, Florence and University San Raffaele, Milan, Italy, Florence, Italy

Pregnancy-and lactation-associated osteoporosis (PLO) is a rare condition characterized by fragility fractures, most commonly vertebral. These complications appear in the third trimester of pregnancy or nearly post partum. The incidence is unknown.

The problems to be faced are diagnosis and therapy of this disorder.

In order to contribute to the recognition of this disorder the Observatory on Fragility Fractures Italy launched in 2023 a multicenter clinical study to evaluate the risk of fractures in 7 major gynecological centers in Italy. The protocol includes evaluation of bone biomarkers and bone density with the REMS technology. A dedicated fracture risk questionnaire has also been developed. The project will be presented and discussed during the meeting.

The therapy of fragility fractures in PLO is a complicate issue. The presentation will include the analysis of pharmaceutical approaches in this disease with an eye to future guidance efforts.

NSS91
INTRODUCTION IN SARCOPENIA

P. Athanassiou[1]

[1]Department of Rheumatology, St. Paul's Hospital, Thessaloniki, Greece

Sarcopenia is a geriatric syndrome with progressive loss of mass, quality and function of skeletal muscles associated with aging. Its prevalence may reach 30% for people over 60 in European populations. Sarcopenia is a multifactorial process: some factors lead to the development of sarcopenia and its associated negative effect on physical function. The loss of skeletal muscle fibers secondary to the reduced number of motor neurons appears to contribute significantly to the disorder, which may further include reduced levels of hormones (particularly GH, IGF-1, MGF, and testosterone), lack of protein and calories of the diet, oxidative stress, inflammatory processes etc. Sarcopenia requires a rehabilitation program to improve physical performance but also nutritional interventions: protein supplementation combined with exercise, leucine-enriched amino acids and vitamin D supplementation, as adjunctive therapy.

NSS92
SARCOPENIA IN METABOLIC DISEASES

I. Athanassiou-Kostoglou[1]

[1]Department of Endocrinology, Asclepeion Hospital, Voula, Athens, Greece

There is a lack of studies with outcome interventions to counteract sarcopenic obesity. However, there are recommendations for sarcopenia and/or weight loss. Strength exercise combined we proper diet demonstrated positive effects on muscle function and combination of a dietary weight loss intervention and additional protein supplements may reduce body fat. Nutrition is a common factor in both entities: sarcopenia and obesity, although interventions differ due to different pathophysiological mechanisms causing the problem: inadequate nutrition vs. excess consumption is the case. The problem is how to increase muscle mass in a situation of energy deficit. During weight loss, which is effective in reducing fat mass, skeletal muscle mass may also be lost and consequently reduced. Higher protein intakes prevent muscle mass loss, especially when combined with an exercise intervention. Exercise programs containing strength and aerobic exercise in combination with dietary weight loss program may possibly have positive effects on sarcopenic obesity.

NSS93
SARCOPENIA IN DIABETES MELLITUS

Y. Dionyssiotis[1]

[1]2nd Physical Medicine and Rehabilitation Department, National Rehabilitation Center EKA, Athens, Greece

The analysis of body composition for assessing the health and nutrition of the individual is a useful test. Diseases such as diabetes mellitus may be associated with adverse changes in body composition. However, there is a lack of studies that examine the association of sarcopenia in patients with type 2 diabetes mellitus (T2DM). To examine this relation individuals who visited endocrinological outpatient clinics, aged 20–80 years (n = 35), to assess the presence of sarcopenia in type 2 diabetes mellitus (T2DM) in comparison with controls. Appendicular skeletal mass (ASM) and other parameters such as total fat and total muscle mass (in kg) were calculated. The skeletal muscle index (SMI) was calculated as ASM divided by the square of the body height in meters. Low muscle mass is defined as SMI < 7.0 kg/m^2 in males and SMI < 5.7 kg/m^2 in females. Low physical performance was defined as a walking speed of < 0.8 m/s. The incidence of sarcopenia was significantly higher in patients with T2DM than in healthy subjects (27% vs 20%, $p = 0.01$ for sarcopenia) and higher in elderly participants (70 years and over) vs. younger (40% vs. 12%, $p < 0.001$). Walking velocity was significantly lower in patients with T2DM than in controls men and women (1.02 ± 0.34 vs. 1.25 ± 0.15, $p < 0.001$) and (1.01 ± 0.22 vs. 1.27 ± 0.12, $p < 0.001$), respectively. The prevalence of sarcopenia in patients with T2DM is moderate and gradually increases significantly in older men.

NSS94
SARCOPENIA IN NEUROLOGICAL DISORDERS

Y. Dionyssiotis[1]

[1]2nd Physical Medicine and Rehabilitation Department, National Rehabilitation Center EKA, Athens, Greece

Muscle decay and dysfunction are seen in ageing, but in neurological disorders with muscular atrophy, muscle loss can be seen also at younger ages. The pathophysiology of sarcopenia in neurological diseases is complicated. One factor is unloading of affected skeletal muscle, and consequently deconditioning which occurs in any muscle that is not active. Low muscle mass can be explained by neurogenic injury, both due to muscle atrophy and disturbed regulation by the central nervous system. A neurological disability causes inactivation and, consequently, unloading of affected skeletal muscle. The danger of decline in capacity for physical activity begins immediately after the injury. Disuse, spasticity, and microvascular damage, contribute to the induction of the marked morphological and enzyme histochemical changes seen in the paralyzed skeletal muscle leading to altered functional properties and atrophy. Motoneuron death and muscle denervation must contribute to the severe atrophy that is

measured in muscles after SCI. Malabsorption leads to protein deficits and muscle catabolism. Hormonal disturbances of the thyroid, hypercortisolism and insulin resistance lead to sarcopenia resulting from protein deficiency.

NSS95
THE CRITICAL SHIFT TO A PROACTIVE APPROACH TO BONE HEALTH

P. D. Cummings[1]

[1]Director of Bone Health Clinic TOCA at Banner, Scottsdale, United States

As the proportion of older individuals across the world increases, the prevalence/incidence of osteoporosis is rising and the economic burden of fragility fractures is growing. Current models for the identification of osteoporotic fracture patients are reactionary; predicated to responding only after the initial fracture in hopes of preventing a secondary fracture. This myopic view of bone health care leaves patients suffering and health care costs spiraling out of control. Imagine never having your high blood pressure checked, and instead waiting for a heart attack or a stroke as your first symptom of heart disease. We are at a critical state and our focus needs to change. Education, identification, and treatment of bone health are archaic, costly, and limited in exposure. They also fail to understand that bone health requires a *Cradle to Grave* mentality.

NSS96
OPTIMAL CLINICAL PARADIGM: 4-PILLAR EVALUATION, INTEGRATED PROFILE, AND MULTIDISCIPLINARY CARE PLAN

R. Patel[1]

[1]Bone Health Specialist TOCA at Banner, Scottsdale, United States

Bone Health Solutions operates in a closed-loop system designating an orthopaedic surgeon working in concert with an Advanced Practice Provider to be the champions for patients with bone health concerns. This care model attempts to eliminate the current problem of fragmented care as orthopaedic surgeons and their staff are already managing the treatment of patients with fragility fractures and preventing future fractures is a natural extension of the treatment phase. Additionally, our program utilizes a Bone Health Educator who is responsible for educating physicians and their staff across a variety of healthcare settings to raise awareness about bone health and patients that may be at a high risk for fracture.

Our clinic uses the Optimal Clinical Paradigm and 4-Pillars assessment to address six critical steps to the evaluation and comprehensive management of patients with regards to Bone Health. The first step is to identify all patients at high risk for fracture from local health care systems, not just those presenting to the Emergency Department. Second is to capture those patients to ensure they are evaluated by a dedicated bone health specialist. Third is to evaluate the patient by performing a comprehensive examination that assesses all aspects of bone health and its potential underlying causes and manifestations. Fourth is to use our 4-Pillar system to diagnose any underlying Biological, Functional, Behavior and Environmental factors that may be contributing to the development or enhancement of their underlying bone health that may place them at high risk. Fifth is to develop an individualized treatment plan involving a multidisciplinary team. The final step is prevention, which involves sustainable educational programs throughout the community.

NSS97
BONE HEALTH SOLUTIONS

P. D. Cummings[1]

[1]Director of Bone Health Clinic TOCA at Banner, Scottsdale, United States

Bone Health Solutions was created to either replace the current FLS programs or augment them depending upon the community they serve. We believe that our Optimal Clinical Paradigm through Bone Health Solutions completely addresses all aspects of bone health care and ultimately decreases the "Patient Care Gap". Data is currently being collected and it is hypothesized that a greater reduction in secondary fractures will occur due to a standardized, less fragmented system. Additionally, it is proposed that patient adherence will increase because of multi-disciplinary treatment, a shared decision-making plan and better education. This program sets the framework to create a more proactive approach to bone health and to better capture patients before they fracture.

NSS98
VITAMIN D STATUS AND DIVERSE MEDICAL PRACTICES IN MEXICO AND LATIN AMERICA

P. A. Garcia-Hernandez[1]

[1]Hospital Universitario "Dr. José E. González" UANL, Professor of Internal Medicine and Endocrinology, Nuevo Léon, Mexico

While vitamin D deficiency has been extensively documented globally, recent years have seen more data from countries near the Equator, including Latin America. Several studies in Latin American countries indicate an overall observed prevalence of vitamin D deficiency at around 35%, with a higher prevalence as age increases, particularly among the elderly. National surveys reveal this deficiency to be more common among older women than men, and levels below 15 ng/ml have been associated with increased mortality. Nevertheless, there are significant differences in prevalence rates related to age, gender, country, latitude, season, and year of publication.

The healthcare systems in the region display considerable diversity, incorporating a mix of public and private services. Despite notable improvements in some countries, unequal access to healthcare persists, primarily due to limitations in economic resources and infrastructure challenges. The duality in financial systems, drawing contributions from public and private sources, underscores the complexity of addressing public health issues such as vitamin D deficiency. The lack of coherent medical information and the limited consensus among specialists in the region further complicate the management of this issue. Notably, some medical practices need to consistently consider exploring vitamin D status, potentially impacting the prescription and guidance of treatments by healthcare professionals, with the associated inconsistency and even low adherence to medical recommendations among the population.

To overcome these challenges, it is imperative to promote collaboration among experts, encourage research to understand patterns of vitamin D deficiency, and enhance continuous medical education to establish a clear consensus and ensure the availability of accurate information. These measures are essential for effectively addressing vitamin D deficiency and improving bone and overall health in the Latin American population.

NSS99
GLOBAL AND REGIONAL DYNAMICS: HETEROGENEITY IN VITAMIN D SUPPLEMENTATION ACROSS LATIN AMERICA

H. Gutierrez-Hermosillo[1]

[1]PHD, Hospital Aranda de la Parra, Department of Geriatrics' Coordinator, Leon, Mexico

Recent data shows hypovitaminosis D is common in Asia, Eurasia, Western Europe, Africa, and the Americas. The IOF LATAM recent report concludes that in the region, as much as 75% of the population has low Vitamin D (VD) levels.

Most of the countries in Latin America have a combined health system, sometimes making access to new technologies or treatments different for those who work in public or private areas; Mexico is not an exception.

Before the COVID-19 pandemic, the prevalence in Mexicans across different ages was as high as 71%, being more pronounced as age increases- in contrast to other continents where it seems to be more prevalent in the younger population- and almost universal among the very old. Recently, we described that those Mexicans with levels below 15 ng/ml have an increased risk of death.

There are many explanations for this high prevalence of hypovitaminosis D, including low sun exposure even in countries like Mexico, where there are sunny days almost all year, urban–rural disparities, darker skin in the population, aging of the population, Government regulations regarding VD added to the food are present only in one-third of the countries in the region, some medical practices among physicians where there have been described that a high percentage do not consider hypovitaminosis D a medical problem, nor identifying the different presentations of VD they have available in their countries or being confused of which of the many presentations to prescribe in their patients having several options (daily, weekly, monthly, tablets, gel caps, etc.).

As part of the development of the Mexican Consensus on Vitamin D, a survey is taking place in several Latin-American Countries and Spain among Medical Doctors and there is a significant percentage that does not measure VD levels in their patients; some others only measure it in those they consider at high risk, most of them do not identify a therapeutic goal or in whom to initiate supplementation.

During the pandemic, there were changes in the intake of various nutrients, including VD, and in the Mexican population, there is data that showed that the serum levels increased significantly; the ingestion of VD compounds can explain this.

Therefore, with all this information, several medical associations in Mexico have focused on developing the National Joint Position.

References:

Osteoporosis Int (2018)29(Suppl1):S149–S565.

International Osteoporosis Foundation (2012). LATAM Audit: epidemiology, cost and impact of osteoporosis in Latin America. Nutr Hosp. 2023 Aug 28;40(4):732–738.

NSS100
FORMULATING UNITY: MEXICO'S APPROACH TO THE NATIONAL JOINT POSITION ON VITAMIN D SUPPLEMENTATION IN ADULTS

J. F. Torres-Naranjo[1]

[1]Centro de Investigación Ósea y de la Composición Corporal, CIO. Universidad de Guadalajara, Guadalajara, Mexico

Vitamin D is crucial in numerous physiological processes beyond maintaining calcium homeostasis. Specialist involvement in Vitamin D prescription underscores its growing clinical importance. However, a lack of consensus on optimal doses and protocols poses a challenge in maximizing benefits while minimizing risks. Addressing this gap is crucial for advancing standardized Vitamin D supplementation practices in healthcare.

This lecture offers insights into the meticulous process of formulating Mexico's national joint position, presented as a regional model. It explores how this national joint position addresses and mitigates heterogeneity within the Latin American context.

Since this national position aimed to harmonize approaches across medical disciplines, a multidisciplinary expert panel was formed, involving specialists from diverse clinical disciplines, including endocrinologists, gynecologists, geriatricians, internists, orthopedic surgeons, and rheumatologists from National Medical Organizations: AMMOM, AMEC, AMG, CMIM, CMO, CMR, CONAMEGER, FEMECOG, and FEMECOT. The panel aimed to address variations in vitamin D supplementation approaches and concentrated on three main areas: the necessity of medical vitamin D supplementation for the general population or specific groups, the need for serum vitamin D level determination to identify suitable candidates for supplementation, and define precise dosages, and the general guidelines for initiating and evaluating the response to medical vitamin D supplementation.

Over the consensus process, substantial differences among expert panel members emerged on specific aspects due to diversity in the formation and approaches. To overcome this, the methodological team compiled an evidence report from relevant clinical evidence. A consensus opinion was formed, and an anonymous peer review process was conducted over four rounds.

The consensus is pivotal in unifying perspectives on vitamin D supplementation in Mexico. This interdisciplinary approach resolves discrepancies and establishes clear guidelines for clinical practices. The proposal extends this approach to the Latin American Region, recognizing documented heterogeneity in medical practices.

NSS101
THE IMPACT OF MENOPAUSE AND HIV ON MIDLIFE BONE HEALTH

T. Madanhire[1]

[1]The Biomedical Research and Training Institute, Harare, Zimbabwe

Improved access to HIV treatment means that more women in Africa are now aging and reaching menopause. Taken together, this means that there is a coh improved access to HIV treatment means that more women in Africa are now aging and reaching menopause. Taken together, this means that there is a cohort of elderly women living with HIV at risk of chronic comorbidities. We identified 450 urban-dwelling South African women aged 40–60 years with and without HIV and followed them for five-years and determined whether HIV infection modifies the effect of menopause on bone mineral density (BMD). At baseline, mean age was 49.5 years, 14% of the women were living with HIV and two in five were postmenopausal. I will describe differences in BMD and osteoporosis (T-score by HIV status at baseline and the change in menopausal status over the five-year period. In addition, I will also show that BMD losses after follow-up are higher among women identified to be living with HIV status at baseline. I will also describe how transitioning from pre- to post-menopause was associated with greater BMD losses in women living with HIV than HIV negative women, novel findings in the African context. Therefore, women living with HIV may be at greater risk of menopause-related osteoporotic fractures such that HIV services should consider routine bone health assessments among midlife women as part of HIV-care delivery.

ort of elderly women living with HIV at risk of chronic comorbidities. We identified 450 urban-dwelling South African women aged 40–60 years with and without HIV and followed them for five-years and determined whether HIV infection modifies the effect of menopause on bone mineral density (BMD). At baseline, mean age was 49.5 years,

14% of the women were living with HIV and two in five were post-menopausal. I will describe differences in BMD and osteoporosis (T-score by HIV status at baseline and the change in menopausal status over the five-year period. In addition, I will also show that BMD losses after follow-up are higher among women identified to be living with HIV status at baseline. I will also describe how transitioning from pre- to post-menopause was associated with greater BMD losses in women living with HIV than HIV negative women, novel findings in the African context. Therefore, women living with HIV may be at greater risk of menopause-related osteoporotic fractures such that HIV services should consider routine bone health assessments among midlife women as part of HIV-care delivery.

NSS102
THE CHALLENGES OF POOR MUSCULOSKELETAL HEALTH IN THE GAMBIA

K. Ward[1]

[1]MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom

Over coming decades, the greatest rise in ageing populations will be seen in Africa. Inevitably there will be a concominent rise in non-communicable diseases, of which musculoskeletal diseases form a major part. Despite this, conditions such as osteoporosis and sarcopenia, and consequent falls and fractures remain low priority for healthcare spending. The Gambia, West Africa, is one of the lowest income countries in the world (in 2022 gross domestic product per capita was 840 USD). Whilst healthcare expenditure has risen over recent years, there remains a challenge for public healthcare facilities to meet the rising demands of an older population.

The Gambian Bone and Muscle Ageing Study (GamBAS) is a prospective observational study in Black African men and women aged $\geq$ 40 years (ISRCTN17900679). Fractures-E3 (https://wellcomeopenresearch.org/articles/8-261/v1) is a multi-country study of fracture epidemiology, ethnography and economic impact across The Gambia, Zimbabwe and South Africa. The community prevalence sur ver of FE3 has two study locations in urban and rural The Gambia. This talk will review findings from both GamBAS and Fractures-E3 Gambia work. Both studies have collected detailed assessments of bone and muscle, together with functional ability, medical history and blood samples. This talk will focus on the epidemiology of osteoporosis, vertebral fractures and associated risk factors. These data are the first of their kind in West Africa and provide important evidence to address barriers in diagnosis and access to care in older people in the country.

NSS103
HIP FRACTURE INCIDENCE AND OUTCOMES IN ZIMBABWE

C. Gregson[1,2]

[1]Professor, University of Bristol, Bristol, United Kingdom, [2]The Biomedical Research and Training Institute, Harare, Zimbabwe

In Southern Africa, rapidly ageing populations are increasing demands on healthcare services. In 2021 there were an estimated 212,830 women and 208,607 men aged $\geq$ 40 years living in Harare, equating to 16.2% of the city's population. Over 2 years we identified 243 hip fracture cases, with a mean age 71 years, most presented to public rather than private hospitals, with a fragility fracture. High-impact trauma e.g., traffic accidents, was generally only seen in younger men. I will describe the estimated current and future hip fracture incidence in Zimbabwe which we found to be similar to rates previously reported in Black South Africans. I will share emerging findings from one-year follow-up of the incident cases, describing how late presentations, comorbid HIV and malnutrition are all common. Non-operative management was also common and associated with high mortality, potentially reflecting surgical and financial challenges and/or multimorbidity. Understanding barriers to care will be important to inform future healthcare delivery, as demands on an already over challenged healthcare system are predicted to increase and fracture services will need to respond.

NSS104
THE ECONOMIC IMPACT OF HIP FRACTURE IN ZIMBABWE AND SOUTH AFRICA

N. Mafirakureva[1], P. Ishumael[2], P. Mushayavanhu[2], J. Masters[3], H. Wilson[4], F. Paruk[5], B. Cassim[6], R. Ferrand[2], C. Gregson[7], S. M. Noble[8]

[1]Sheffield Centre for Health and Related Research (SCHARR), Division of Population Health, School of Medicine and Population Health, University of Sheffield, Sheffield, United Kingdom, [2]The Research Unit Zimbabwe, Harare Zimbabwe, Biomedical Training Research Institute, Harare, Zimbabwe, [3]NDORMS, University of Oxford, Oxford, United Kingdom, [4]Musculoskeletal Research Unit, Bristol Medical School, University of Bristol, Bristol, United Kingdom, [5]Department of Rhuematology, School of Clinical Medicine, University of Kwa-Zulu Natal Durban, Durban, South Africa, [6]Department of Geriatrics School of Clinical Medicine, University of Kwa-Zulu Natal Durban, Durban, South Africa, [7]The Biomedical Research and Training Institute, Harare, Zimbabwe, [8]Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, United Kingdom

Despite rapidly ageing populations and projected increases in hip fractures, data on hip fracture-related healthcare resource use and costs in sub-Saharan Africa are limited. The worldwide average health and social care cost in the first year post hip fracture was reported as US$43,669 per patient in a 2017 systematic review, with inpatient care costing US$13,331. Costs were highly variable, reflecting different contexts, variation in methodology, elements of care and patient populations. Data on costs associated with hip fractures are important for quantifying demands on healthcare services, informing accurate cost-effectiveness analyses, and for guiding policy decisions on priority setting, planning, and budgeting. As part of the Fractures-E3 study, we collected healthcare resource utilisation data and costs for cohorts of hip fracture patients in South Africa, The Gambia, and Zimbabwe. This talk will describe the first estimates of the direct healthcare costs associated with the acute management of hip fractures in South Africa and Zimbabwe. We will also discuss the methodological challenges associated with estimating these costs in sub-Saharan African settings.

NSS105
WHY; INTRODUCTION TO PPI, OVERVIEW OF IMPACT AND PROGRESS

A. Adebajo[1]

[1]Faculty of Medicine, Dentistry and Health, University of Sheffield, Sheffield, United Kingdom.

Patient and public involvement and engagement (PPI/E) is research being carried out by researchers alongside members of the public rather than to, about, or for them (National Institute for Health Research, UK). PPI/E as a concept is not new, and it has gained support in recent years due to increased awareness and commitments placed on researchers by funding agencies, patient groups, regulators, reimbursement agencies/HTAs and scientific societies. Notably, the dynamic, heterogeneous and multifaceted nature of lived experiences encourages researchers to partner with patients early and during

research if their primary aim is to learn from patients and effectively improve health for all. This session will focus on why PPI/E is imperative to improve/impact health for all.

NSS106
WHAT; PPI ARTICLE COLLECTION AS A GLOBAL RESOURCE

C. Fitzpatrick[1]

[1]Senior Editor, BMC Medicine, London, United Kingdom

Musculoskeletal and rheumatic healthcare practitioners play a reciprocal role in developing strategies to involve patients as authentic partners in clinical practice and research; however, many researchers express needing knowledge and resources to contact, plan and/or manage meaningful PPI. In June 2023, BMC Rheumatology and BMC Musculoskeletal Disorders (part of Springer Nature) published an Article Collection on 'Patient and public involvement (PPI) in rheumatic and musculoskeletal research' to provide a constructive learning experience and involve public partners more effectively. All papers championing PPI were welcomed and considered. The Article Collection is a global resource of musculoskeletal-related examples ranging from research priority setting through to guideline implementation & community partnerships for multi-modal management. This session will share available PPI resources and where to find them as part of the special collection, highlighting examples from which tailoring to suit different musculoskeletal diseases may be undertaken. Article Collection link:https://www.biomedcentral.com/collections/PPI-RMD

1. Arumugam A, Phillips LR, Moore A, Kumaran SD, Sampath KK, Migliorini F, Maffulli N, Ranganadhababu B, Hegazy F, Botto-van Bemden A. Patient and public involvement in research: a review of practical resources for young investigators. BMC Rheumatol. 2023;7:2.
2. Myers H, Keefe F, George SZ, George SZ, Kennedy J, Davis Lake A, Martinez C, Cook C. The influence of a cognitive behavioural approach on changing patient expectations for conservative care in shoulder pain treatment: a protocol for a pragmatic randomized controlled trial. BMC Musculoskelet Disord. 2021;22:727.
3. Åkesson KS, Sundén A, Stigmar K, Stigmar K, Fagerstrom C, Pawlikowska T, Hansson EE. Enablement and empowerment among patients participating in a supported osteoarthritis self-management programme—a prospective observational study. BMC Musculoskelet Disord. 2022;23:555.
4. Dorris, E.R., Grealis, S., Kegl K, Kennedy N, Larkin L, Lynch B, Moran A, O'Brien J, Skeffington S, Slater K, Ward R, Willet A. Priorities for rheumatic and musculoskeletal disease research in Ireland. BMC Rheumatol. 2022;6:55.
5. Vitaloni M, Botto-van Bemden A, Sciortino R, Carne X, Quintero M, Santos-Moreno P, Espinosa R, Rillo O, Monfort J, de Abajo F, Oswald E, Matucci M, du Souich P, Moller I, Bauers MR, Vinci A, Scotton D, Bibas M, Eakin G, Verges J. A patients' view of OA: the Global Osteoarthritis Patient Perception Survey (GOAPPS), a pilot study. BMC Musculoskelet Disord. 2020;21:727.
6. Teo JL, Zheng Z, Bird SR. Identifying the factors affecting 'patient engagement' in exercise rehabilitation. BMC Sport Sci Med Rehabil 2022;14:18.
7. Middlebrook N, Heneghan NR, Falla D, Silvester L, Rushton AB, Soundy AA. Successful recovery following musculoskeletal trauma: protocol for a qualitative study of patients' and physiotherapists' perceptions. BMC Musculoskelet Disord 2021;22:163.
8. Cornelissen D, Boonen A, Evers S, van den Bergh JP, Bours S, Wyers CE, van Kuijk S, van Oostwaard M, van der Weijden T, Hiligsmann M. Improvement of osteoporosis Care Organized by Nurses: ICON study—Protocol of a quasi-experimental study to assess the (cost)-effectiveness of combining a decision aid with motivational interviewing for improving medication persistence in patients with a recent fracture being treated at the fracture liaison service. BMC Musculoskelet Disord. 2021;22:913.

NSS107
HOW; IMPLEMENTING PATIENT PARTNERSHIPS

M. De Wit[1]

[1]Patient Research Partner, Stichting Tools, Amsterdam, Netherlands

Practical examples for involving patients in health research. There is increasing emphasis on patient-centred research to support the development, approval and reimbursement of health interventions that best meet patients' needs. Through a structured, collaborative process the group generated practical guidance to facilitate optimal patient involvement in basic, translational and clinical research. Patient involvement is a relational process. Principles will be shared based on lessons learned through applied experience. This session will focus on partnering with patients, and sharing an example of applied principles to facilitate optimal patient engagement.

NSS108
WHERE WE ARE GOING; PPI OPPORTUNITIES

A. Botto-Van Bemden[1,2,3,4,5]

[1]Global Patient Ambassador, Patient and Public Involvement, Musculoskeletal Research International, Inc., Miami, United States, [2]EUPATI Fellow, EUPATI, Utrecht, Netherlands, [3]Patient Partner, Patient Focused Medicines Development, Clinical Research Experts, LLC., Tampa, United States, [4]Chairperson, Patient Registry, International Cartilage Repair and Joint Preservation Society, Zurich, Switzerland, [5]Member Engagement Co-Chair, Patient-Centered Special Interest Group, ISPOR- The Professional Society for Health Economics and Outcomes Research, Lawrenceville, United States

Patient preferences are a type of patient experience data (PED). Including patient preferences stimulates innovation in medical product development, patient-focused drug development/PFDD or patient focused medicines development/PFMD. Industry prioritizes attributes that matter most to patients, driving creation of more patient-focused interventions and technologies. Incorporating patient preferences explicitly into HTA and regulatory decision-making is a transformative concept in healthcare that not only promotes patient-centric care but also has significant global implications & enormous opportunities. By taking into account the full spectrum of diverse needs and preferences of patients, stakeholders can make more accurate and informed decisions about which treatments should be available for patients. This session will focus on upcoming PPI opportunities with PED dossiers, HTAs and regulators.

NSS109
HYPERTHYROIDISM. ETIOLOGY AND CLINICAL MANIFESTATIONS

I. Kostoglou-Athanassiou[1]

[1]Department of Endocrinology, Diabetes and Metabolism, Asclepeion Hospital, Voula,, Athens, Greece

Hyperthyroidism is a frequent thyroid disorder which may be due to a variety of causes. Hyperthyroidism includes the increase in thyroid hormone levels either directly from the thyroid or from extrathyroidal sources. Hyperthyroidism may have an autoimmune etiology, may be

due to hormone production from autonomous or toxic adenomas, or to thyroid inflammation which causes tissue destruction, and, finally, from extrathyroidal hormone production, such as in the ovaries or to excessive thyroid hormone intake. From the history and the clinical picture, depending on the severity of hyperthyroidism, there usually exist weight loss, tachycardia and rarely atrial fibrillation, fatigue and muscular weakness and rarely periodic paralysis, excessive sweating, gastrointestinal and neuropsychiatric disorders, goiter and other manifestations. Finally, in Graves' disease extrathyroidal manifestations may be found, such as ophthalmopathy and pretibial myxedema. Laboratory evaluation includes the measurement of thyroid hormones in the blood, where T_3 and T_4 are elevated, rarely T_4 is normal and TSH is decreased.

NSS110
HYPERTHYROIDISM. PSYCHOSOCIAL IMPLICATIONS

Y. Athanassiou[1]

[1]Trinity College, Dublin, Ireland

Stressful life events may lead to the development or exacerbation of Hashimoto's thyroiditis and Graves' disease. Financial crises or bereavement may lead to the development of Graves' disease and severe hyperthyroidism. Additionally, hyperthyroidism itself may have psychological and psychiatric implications. The disease leads to depression and severely affects quality of life. Management of hyperthyroidism in the cases related to bereavement may lead to quick recovery and in many instances full remission of the disease. Successful management of hyperthyroidism leads to improvement of psychological disturbances and quality of life.

NSS111
HYPERTHYROIDISM AND SARCOPENIA

L. Athanassiou[1]

[1]Department of Rheumatology, Asclepeion Hospital, Voula, Athens, Greece

Overt hyperthyroidism causes proximal limb muscle weakness which improves after correction of the disease. Subclinical hyperthyroidism may also cause a degree of muscle weakness. This muscle weakness may be significant if it is observed in aging patients, who already have muscle loss. Sarcopenia, a syndrome which is currently under intense scientific investigation, is considered a main risk factor for morbidity and mortality among adults. Thyrotoxicosis may contribute to its development. Indices of sarcopenia such as grip strength, as a measure of muscle strength, appendicular skeletal muscle mass as an index of muscle quantity and gait speed as an index of physical performance were found to be impaired in patients with thyrotoxicosis. Thus, thyrotoxicosis may be associated with sarcopenia. Successful treatment of hyperthyroidism leads to improvement of muscle mass and muscle function.

NSS112
HYPERTHYROIDISM AND OSTEOPOROSIS. PATHOPHYSIOLOGY AND MANAGEMENT

P. Athanassiou[1]

[1]Department of Rheumatology, St. Paul's Hospital, Thessaloniki, Greece

Thyroid hormones are essential for normal skeletal development and normal bone metabolism in adults. However, increased thyroid hormone levels may have detrimental effects on bone metabolism and bone structure. Severe hyperthyroidism increases bone turnover, decreases bone mass and subsequently bone mineral density. Subclinical hyperthyroidism, which is defined as low TSH levels and free T_4 and T_3 levels within the normal range, which may have minimal symptoms or may be completely asymptomatic leads to decreased bone mass and bone mineral density. Hyperthyroidism may lead to an increased risk of fractures. Medical or surgical successful management of hyperthyroidism may ameliorate bone mass loss and may lead to improvement in bone mineral density. In cases of long-standing hyperthyroidism, osteopenia and osteoporosis should be managed with vitamin D and calcium supplementation as well as with the administration of agents such as bisphosphonates as well as denosumab. The administration of alendronate and the effervescent formulation of alendronate may lead to successful management of osteoporosis in the context of long-standing hyperthyroidism.

NSS113
OSTEOPOROSIS AND THE SPINE: KEY STATISTICS AND AN OVERVIEW OF THE NATIONAL SPINE HEALTH FOUNDATION'S KEY PATIENT AND HEALTH CARE PROFESSIONAL INITIATIVES

T. Schuler[1,2]

[1]President, National Spine Health Foundation, Reston, United States, [2]Founder, Virginia Spine Institute, Reston, United States

- Fractures caused by osteoporosis most often occur in the spine (and in the United States, there are 1.5 million vertebral compression fractures that occur each year)
- The age- and sex-specific prevalence of osteoporosis in patients undergoing spine surgery goes up markedly as people age, particularly in females (from 27.8% for women from age 50–59 to 75.4% for women from age 70–79)
- The efforts that the National Spine Health Foundation (which Dr. Schuler founded) is driving to educate patients and health care professionals on the need to identify, diagnose, and treat vertebral compression and spine fractures (both surgically and through anti-osteoporotic medications)
- His work as a leading spine surgeon and how he addresses spine and bone health in his patient population
- The opportunity to disseminate and create patient education tools in support of the recently released North American Spine Society (NASS) Diagnosis and Treatment of Osteoporotic Vertebral Compression Fractures in Adults clinical practice guideline through the members of the National Spine Health Foundation Spine Health Coalition (which includes the Cervical Spine Research Society, Lumbar Spine Research Society, National Spine Health Foundation, North American Spine Society, and Setting Scoliosis Straight Foundation)

NSS114
A SPINE SURGEON PERSPECTIVE ON THE NEED FOR PERIOPERATIVE SPINE AND BONE HEALTH OPTIMIZATION

P. Anderson[1,2]

[1]Co-Chair, National Spine Health Foundation Spine & Bone Health Task Force, Renson, United States, [2]University of Wisconsin School of Medicine, Madison, United States

- Gaps in spine surgeon awareness of the need to conduct perioperative spine health optimization before surgery as a crucial step for improving patient outcomes and reducing complications (which includes a thorough bone health assessment) given the

high prevalence of osteoporosis in patients undergoing spine surgery
- Why spine surgeons should establish care pathways to systematically identify and diagnose osteoporosis in their practices (which may include the establishment of a Fracture Liaison Service program or other means to ensure patients are assessed before surgery)
- The need for vertebral compression fractures to be treated as equally aggressively as hip fractures, with medications including anabolics
- Opportunities for spine/orthopaedic surgeons to work more effectively with bone health specialists to maximize patient care and improve outcomes

NSS115
SPINE AND BONE HEALTH PATIENT EDUCATIONAL GAPS AND NEEDS

R. Roy[1]

[1]Chief Executive Officer, National Spine Health Foundation, Renson, United States

- Key messages that are most effective with patients to educate them on the connection between spine and bone health (including prevention of osteoporosis, how it is treated, and why bone health is such an important component of spine health)
- How to get patients to understand the potential need to delay surgery (to ensure their bones are strong enough to increase the chances of having a good surgical outcome)
- A review of the targeted patient education NSHF is providing to educate and activate patients to take action in talking with their health care professionals regarding spine and bone health, including the most effective written, digital, and social media content
- Successful approaches to empowering patients to ask their health care professionals about spine and bone health

NSS116
A EUROPEAN PERSPECTIVE ON KEY SPINE SURGEON GAPS IN THE DIAGNOSIS AND TREATMENT OF OSTEOPOROTIC PATIENTS

E. Najjar[1,2]

[1]Member, North American Spine Society Continuing Medical Education Committee Member, Illinois, United States, [2]Associate Spinal Specialist, Centre for Spinal Studies & Surgery, Nottingham University Hospitals, Nottingham, United Kingdom

- Economic and personal impact of vertebral fractures, a national and global challenge
- UK National Institute for Health and Care Excellence (NICE) guidelines for early assessment and tailored interventions
- The effect of osteoporotic fractures on spinal global sagittal alignment
- The effect of bone quality on mechanical failure following spine surgery
- Integrating bone quality assessment into decision making and surgical planning in spine surgery

NSS117
GCS IN THE TREATMENT OF RHEUMATOID ARTHRITIS. FRIENDS ?

O. D. Messina[1]

[1]Rheumatologist, IRO Medical Research Centre, Buenos Aires, Argentina

Low dose glucocorticoids (GC) therapy is widely used in rheumatoid arthritis (RA) but the balance of benefit (short term) and harm (long term) is still unclear. GC was first used at the Mayo Clinic in a patients with RA by Hench et al. with spectacular results but after some time of enthusiasm many side effects were evident. In the GLORIA trial (glucocorticoid low-dose in rheumatoid arthritis) pragmatic double-blind randomized trial compared 2 years of prednisolone, 5 mg/day to placebo in patients aged > 65 years with active RA added to disease-modifying treatments including 14% on biologics. Disease activity was 0.37 points lower on prednisolone (95% CL, $p < 0.0001$), joint damage progression was 1,7 points lower (95% CL 0.7 $p = 0.003$). 60% vs 49% of patients experienced the harm outcome adjusted relative risk 1.24 (95% CL 1.04, $p = 0.02$) with the largest contrast in non severe infections. Add on low dose prednisolone has beneficial long-term effects in senior patients with established RA. this suggest a favourable balance of benefit and harm. However other studies using short term GC as a "bridging therapy "at high dose showed no long –term benefit with regard to pregression of radiographic damage at I year. One study by Wassenberg et al. showed than beryloe doses, lower than 5 mg of prednisolone given over 2 years in combination with background DMARDs therapy substantially decreased radiographic progression in early RA at low risk.

Many years ago a Dutch study by M Boers, the COBRA study showed that the combination of prednisolone and MTX and SSZ during the first six months was superior to SSZ alone with less articular damage and less disease activity. In a recent study Lotte van Ouwerkerk et al. compared the use of GC over time in patients with RA who were or were not treated initially with GC as a "bridging therapy ", combining data from BeSt, CareRA and COBRA trials. In randomized trials comparing GC bridging and no GC bridging, bridgers had more rapid clinical improvement, fewer DMARD changes and similar late use of GC compared with non bridgers. GC bridging per protocol resulted, as could be expected in higher cumulative GC over 2 years.

Future research will develop new molecules with less side effects modulating transrepression and transactivation. Some years ago deflazacort, an oxazoline derivative of prednisolone showed less side effects although its equipotency compared with traditional GC was questioned and not definitively established. However deflazacort is approved and prescribed in several European, Latin American and Asian countries.

NSS118
GLUCOCORTICOIDS "FOE"

G. Adami[1]

[1]Medical Doctor presso Azienda Ospedaliera Universitaria Integrata Verona, Verona, Italy

Glucocorticoids are widely used to treat common inflammatory diseases, including inflammatory rheumatic musculoskeletal diseases (iRMDs) such as rheumatoid arthritis and connective tissue diseases. More than 1% of the overall population uses glucocorticoids in chronic as part of the treatment of their condition, and, as a result, glucocorticoid-induced osteoporosis (GIOP) is the most common form of secondary osteoporosis. Glucocorticoids have various detrimental effects on bone. In the early phases, glucocorticoids can

increase osteoclasts activity and, simultaneously, can decrease osteoblasts functionality. Later in the treatment course, glucocorticoids are associated with an overall suppression of bone turnover with osteocyte apoptosis and microarchitectural damage. In aggregate, glucocorticoids cause a rapid reduction in bone mineral density (BMD), which is only partially preventable by anti-osteoporosis medications. Furthermore, by damaging bone microarchitecture, glucocorticoids alter the BMD fracture threshold; in other words, glucocorticoid users tend to fracture at osteopenic or even normal T-scores.

NSS119
MANAGING EGFR AND BONE

R. Keen[1]

[1]Consultant in Metabolic Bone Disease, Royal National Orthopaedic Hospital, Brockley Hill, Stanmore, United Kingdom

Dr Keen will discuss the clinically pertinent management of osteoporosis in people with chronic kidney disease. The attendees will be equipped with latest data on guidelines and data on pharmacological management of osteoporosis in the context of kidney disease.

NSS120
MANAGING AROMATASE INHIBITOR INDUCED BONE LOSS

M. K. Nisar[1,2,3,4]

[1]Consultant Rheumatologist & Physician, Luton, United Kingdom, [2]Director of Research & Development, Luton, United Kingdom, [3]Secretary to East Anglian Rheumatology Society, Luton, United Kingdom, [4]Luton & Dunstable University Hospital, Luton, United Kingdom

Dr Nisar will discuss the guidelines encompassing latest data on aromatase inhibitor induced bone loss in women with breast cancer and how the latest consensus guidelines have provided real world evidence of their efficacy in improving bone health and fracture prevention.

NSS121
OSTEOCALCIN (OC) "OLD"-NEW MARKER—CAN IT BE PROGNOSTIC FOR CVD?

B. Miskic[1], V. Cosic[2], S. Sokolovic[3], M. Knezevic-Pravecek[4], I. Bitunjac[5], K. Cvitkusic-Lukenda[4]

[1]GH drJ Bencevic, Slav. Brod, Slavonski Brod, Croatia, [2]Faculty of Dental medicine and health, University of Osijek, Osijek, Croatia, [3]University clinic Sarajevo, Sarajevo, Bosnia & Herzegovina, [4]GH dr.J.Bencevic SL.Brod, GH dr.J.Bencevic SL.Brod, Croatia, [5]GH dr.J.Bencevic SL.Brod, SL.Brod, Croatia

Objective: Cardiovascular diseases have been the leading cause of death worldwide for a long time. systematic analysis of modern literature. Systematic analysis of modern literature from the scientific databases (2013–2023.) define osteocalcin as a potential biomarker of cardiovascular status. Its increased values are associated with a potentially protective mechanism against the development of cardiovascular diseases (CVD). Contradictory in the pathogenitic mechanism of CVD leaves a lot if possibilities for research.
We concluded a short -term pilot study on the association of OC levels with acute myocardial infarct (AMI) and Heart failure (HF) in the Department of cardiology, in GH Slav. Brod, Croatia.
Materialsand Methods: We investigated serum level of osteocalcin in the patients (N25) with (AMI) and (N23) patients with (HF) comparable with age AMI 51 ± 3,6, IC 54 ± 5,3 and sex. Female (N8) AMI; (N7) and HF. and correlation between level of troponin, N-terminal proBrain Natriuremic Peptide (NT-proBNP) and other bone markers. Those with diseases affecting bone status were excluded.
We used the SPSS 28.0.1 package.
Results: Tropinin level (ng/L) was statistically significant between those two categories: AMI and HF, $p < \mathbf{0.001}$ Nt-proBNP (pg/ml) correlated with stage of HF but level of osteocalcin β-Crosslabs (ng/ml), vitamin D (nmol/L), Parathyroid hormon (pg/ml) and calcium were not very different between groups.
Conclusion We found slightly higher, statistically insignificant levels of OC in subjects with AMI. The reason for the insignificant difference may be the small number or great scale of results. From our results its cannot be ruled out whether OC is a significant predictor of CVD and by what mechanism. Large randomized well-designed double-blind studies with clear hypotheses are needed to gain insight into the real role of OC in CVD.

NSS122
THE HIDDEN UPSTAIRS BETWEEN BONE DENSITY AND CARDIOVASCULAR MORTALITY

H. Bassiouni[1]

[1]Update Rheumatology Foundation, Cairo, Egypt

Objective: Cardiovascular disease (CVD) and osteoporosis are common age-connected conditions associated with high morbidity, mortality, and disability. Accumulating biological and epidemiological evidence holds up a link between the two conditions namely low bone mass and CV disease. The aim of the present work is to review the relation between both conditions.
Observations: Atherosclerotic calcification and bone mineralization split a number of intriguing common aspects. It is now conceded that arterial tissue calcification is not merely a passive process of calcium phosphate precipitation or adsorption in advanced atherosclerosis, but alternatively is a highly organized process that is mastered by mechanisms similar to those involved in bone mineralization. Literature suggests that low BMD and bone loss seems to be risk factors for cardiovascular mortality in both genders. A number of studies have studied the link between BMD and cardiovascular morbidity. In the Health, Aging, and Body Composition (ABC) Study, it was noted that the volumetric BMD (vBMD) measures of the spine were notably and inversely associated with prevalent CVD in both genders, and areal BMD (aBMD) of the trochanter was related to CVD in women. Further browsing in papers suggested that there were more relevant associations between osteoporosis and CVD in women proposed by the MORE trial which highlighted that osteoporosis was a strong predictor of incident cardiovascular events in postmenopausal women maverick of age and other traditional cardiovascular risk factors. An inverse relationship was found in women between bone mass and various measures of subclinical disease in many publications. Cross-sectionally, vascular calcification, in both the aorta and the coronary arteries was found to disagree if correlated with bone density and directly related to vertebral and hip fractures, chiefly in white postmenopausal women.
Conclusion: CVD and osteoporosis increase with aging. Historically, these two conditions were considered unrelated and their coexistence was attributed to unconventional age-related processes. Currently, an increasing body of biological and epidemiological evidence has furnished support for a link between the two conditions far from age and shared risk factors. It is suggested that common molecular, cellular, and biochemical processes are implicated in their pathogenesis and warrants further clarifying studies.

NSS123
OSTEOPOROSIS AND CARDIOVASCULAR DISEASES: A CASE-SERIES STUDY

S. Sokolovic[1], I. Sokolovic[1]

[1]Society for Osteoporosis in Federation of Bosnia and Herzegovina, Sarajevo, Bosnia & Herzegovina

Introduction: Osteoporosis is associated with increased risk for cardiovascular morbidity and mortality. On the other hand, cardiovascular disorders may reflect bone and mineral dysregulation. This risk is particularly observed in postmenopausal women and elderly male. The estrogen deficiency plays a major role in women for osteoporosis and cardiovascular diseases. Both vitamin D and minerals have another important influence in both. The BMD, hyperlipidemia, diabetes contribute to and in cardiovascular diseases. The pro-inflammatory cytokines, osteoprotegerin act in the same time on bone and vascular calcifications. Both entities share the similar pathophysiology processes, clinical manifestations, prevention of the same risk factors and some novel therapies.
Material and methods: A case series study was implemented. Total of 16 postmenopausal women were included in a study. No males were included. The cardiovascular risk factors, bone mineral density (BMD), arterial hypertension, arterial stiffness, coronary calcium score and vitamin D level were analysed. Multi slice CT scan (MSCT) was diagnostic procedure for CHD.
Results: Among 16 patients, there were 9 suffering from the severe Osteoporosis and Coronary Heart Disease, while other 7 subjects did not have either severe osteoporosis or any other heart disease. Osteopenia was included.

Severe Osteoporosis (9pts)		No Osteoporosis/Osteopenia (7pts)
Average age	57y/o	65y/o
Average BMD	3,4	1,6
Coronary Calcium score:	368	18
LAD Stenosis	≥70%	≤ 50%
Vitamin D:	6,9 ng/ml	28 ng/ml
Blood pressure/Pulse: 146/94mmHg/78/min		102/88mmhg/84/min
Arterial stiffness /Vascular age	8 years older	3 years younger

Conclusion/discussion: Patients with osteoporosis and with no manifested CVD should be examined for silent heart disease. Patients with manifested CVD should be examined for osteoporosis.

NSS124
PREVENTION OF HIP FRACTURES

B. Duyur Cakit[1]

[1]MD, Professor, University of Health Science Ankara Training and Research Hospital, Department of Physical Medicine and Rehabilitation, Ankara, Turkiye

Osteoporosis is a major public health problem that affects millions of people worldwide. A frequent and serious consequence of osteoporosis is a hip fracture leading to high morbidity, excess mortality, substantial costs and decreased quality of life. Several risk factors are known to predispose individuals to hip fractures, including: female gender, older age, a high number of comorbidities, low cognitive function, previous spine or hip fracture and poor neuromuscular function. Falls in older adults are a highly prevalent problem.

Sarcopenia is identified as one of the most common comorbidities associated with femoral neck fracture. Preventive interventions are needed to reduce the number of hip fractures. Several interventions have been described to reduce the risk of hip fractures including regular exercises, drug treatments (e.g. calcium, vitamin D and antiresorptives/anabolics) and/or the use of hip protectors. Since more than 90% of the hip fractures are the result of a fall, hip protectors could be an interesting strategy/intervention for preventing hip fractures. Shock-absorbing flooring may also minimise fall-related injuries. In conclusion, preventing fractures in older community-dwelling adults requires careful consideration of an individual's estimated fracture risk, life expectancy, and health priorities. Clinicians must consider pharmacologic and non-pharmacologic interventions to reduce fracture burden in this vulnerable population.

NSS125
ANTIOSTEOPOROTIC AGENTS AND FRACTURE HEALING

P. Borman[1]

[1]MD, Professor of PMR, University of Ankara Medipol, Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Ankara, Turkiye

Osteoporosis poses a significant public health concern, characterized by compromised bone strength and an increased risk of fractures. There is an intricate relationship between antiosteoporotic agents and the process of fracture healing. As osteoporotic fractures are associated with delayed and impaired healing, understanding the impact of pharmacological interventions becomes crucial. Antiosteoporotic agents, including bisphosphonates, selective estrogen receptor modulators, denosumab, and anabolic agents such as teriparatide, are commonly prescribed to manage osteoporosis and prevent fractures. While these medications primarily focus on bone density improvement, emerging evidence suggests their potential influence on the fracture healing process. While a number of studies using osteoporotic animal models have shown a detrimental impact on fracture healing, clinical evidence regarding whether fracture healing is impaired in the presence of osteoporosis is complicated by numerous associated conditions including advancing age. The mechanism of some anti-osteoporotic medications creates concern about a potential detrimental impact on fracture healing, while others appear to enhance fracture healing. There are still large gaps in the understanding of the potential effect of anti-osteoporotic drugs on fracture healing, although based on present knowledge a recent or present fracture should not be considered as a contraindication to such treatment. The current evidence indicates that the beneficial effects of anti-osteoporosis treatment exceeds any concerns about possible adverse consequences on fracture healing in most circumstances. The current literature, highlighting the mechanisms by which antiosteoporotic agents may impact fracture healing, shedding light on potential therapeutic implications and areas for future research will be discussed in this session.

NSS126
REHABILITATION OF HIP FRACTURES

A. Yaman[1]

[1]MD, Specialist of PMR, Ankara Etlik City Hospital, Department of Physical Medicine and Rehabilitation, Ankara, Turkiye

Hip fractures represent a significant health challenge, particularly among the elderly, often resulting from falls or trauma. The rehabilitation process following a hip fracture is crucial for restoring functionality, independence, and overall quality of life. Key aspects of

hip fracture rehabilitation encompass early postoperative care, physical therapy, and the psychosocial elements which are essential for a successful recovery.

The initial phase of hip fracture rehabilitation begins with educating patients and their caregivers about the importance of compliance with rehabilitation protocols, medication management, and lifestyle modifications are crucial. The postoperative care with early mobilization is encouraged to prevent complications associated with immobility and to promote circulation. Physical therapy plays a central role in hip fracture rehabilitation, aiming to rebuild strength, improve balance, and enhance mobility. Progressive exercises, tailored to the individual's capabilities, target the hip muscles and surrounding areas. Weight-bearing exercises, gait training, and balance drills are essential components, gradually reintroducing patients to daily activities. The use of adaptive devices like walker or cane, and assistive technology is integral to hip fracture rehabilitation. As psychological impact of a hip fracture, including fear of falling and anxiety about mobility, can impede progress, psychosocial aspects of hip fracture rehabilitation are critical for a holistic recovery. In addition, safe and supportive environment modifications enhance patient confidence and facilitate a smoother transition back to independent living.

As a conclusion; a comprehensive individualized approach that combines early postoperative care, targeted physical therapy, adaptive technologies, psychosocial support, environmental modifications, and patient education is essential for achieving optimal outcomes and contribute significantly to restoring functionality and enhancing the overall well-being of patients.

NSS127
HEALTH ECONOMICS OF OSTEOPOROSIS: THE MISSED INTERVENTIONAL THRESHOLD

Y. El Miedany[1]

[1]Consultant Rheumatologist, Canterbury Christ Church University, Kent, United Kingdom

Healthcare systems face considerable challenges to meet the population healthcare needs. This is of particular interest in low- and middle-income countries (LMICs) who have markedly fewer resources than those in high income countries. Therefore, the strategy in which the existing resources are assigned across competing priorities is critical in affecting the level of the health is generated overall, who receives healthcare interventions and who goes without. There are several tools of economic evaluation to facilitate and help policy makers in the process of resource allocation (e.g. cost-effectiveness analysis (CEA). The central factor is to consider both the effectiveness of the intervention versus its cost to be able to determine whether the health gains offered by an intervention are large enough relative to its costs and consequently warrant adoption. This involves some notion of the value that should be achieved by an intervention, which is most frequently represented using a cost-effectiveness threshold. This presentation is for healthcare professionals who are interested in health economics and would like to learn more about approaches to implementing it in standard practice. It will give an introduction of health economics and cost benefit analysis in a trial to make this challenging topic easy. This will include health economics evaluations, outcomes as well as modelling, Quality Adjusted Life Year (QALY), the incremental cost-effectiveness ratio (ICER), willingness to pay threshold and its implementation in osteoporosis and fragility fractures management.

NSS128
DIRECT COST OF OSTEOPOROTIC HIP FRACTURES

W. El Wakil[1]

[1]Lecturer Rheumatology and Rehabilitation, Alexandria University, Alexandria, Egypt

Osteoporosis and its associated fragility fractures not only have a major impact on health and quality of life but also impose a significant economic burden on the health system. The economic costs of a disease can be used to estimate the disease burden whether at the national or global levels. The costs in the economy can stratified into two sections, direct and indirect costs. The direct costs are the treatment costs, whereas the indirect costs are the costs associated with the days off from work due to illness.

Among the different components of health care systems, hospitals are facing a shortage of resources as a challenge, and every type of shortage of resources leads to a competition. Under such a condition and competition, only the organizations that could reduce the costs while paying attention to the quality of services provided can be successful. Therefore, cost information can be of great value in optimizing resource allocation, modifying budgets, reducing waste costs, and making more efficient use of available resources. The objective of every cost detection and cost management system is to provide accurate and practical information to help organizations deliver quality services under a competitive setting. This presentation will discuss the large treatment gap among those at high risk for fragility fractures at the international as well as national levels, direct as well as indirect costs of hip fractures, and approaches to implement the annual costs of hip fractures, calculated through construction of a Continuum-Care Episode, as a confounder in the health policy decision-making.

NSS129
ECONOMIC EVALUATION OF FRACTURE LIAISON SERVICE (FLS): THE EGYPTIAN EXPERIENCE

M. Toth[1,2]

[1]H. Senior Clinical Lecturer, King's College London, London, United Kingdom, [2]Medicine, Dartford, Kent, United Kingdom

With populations ageing, the burden of fragility fractures on healthcare systems around the world is on the rise, resulting in a spiral of increased patient disability, loss of independence, and early mortality within the older population. Given that patients with a fragility fracture are at substantially high risk of subsequent fractures, effective secondary fracture prevention is of critical importance. In this regard, Fracture Liaison Services (FLS) have been shown to be an optimal way to systematically identify, assess, treat, and monitor patients who have recently sustained a fragility fracture, and they have been proven to reduce the risk of subsequent fractures in numerous studies and reviews. This presentation will discuss the health benefits and budget impact of the national Fracture Liaison Services (FLS) in Egypt and its potential effectiveness in shaping positive patient outcomes and help drive policy decisions. Markov model has been assessed through five health states (with and without osteoporosis treatment, subsequent hip, subsequent major fracture, and death). A time horizon of 10 years and a 1-year cycle duration was used. Clinical and economic variables were estimated from the literature and Egyptian clinical practice. Effectiveness was measured in life-years gained (LYG) and quality-adjusted life years gained (QALYs). Implementing FLS at a national level in Egypt, has benefited patients' outcomes, through a significant reduction in subsequent fragility fractures and gains in quality of life, whilst at the same time reducing hospital bed days, surgeries, need for institutional social care, and their associated costs.

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): Posters Abstracts

P101
EXAMINING TREATMENT TARGETS AND EQUITY IN BONE-ACTIVE MEDICATION USE WITHIN SECONDARY FRACTURE PREVENTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

A. A. Ali[1], E. H. Huszti[1], S. N. Noordin[2], U. A. Ali[2], J. S. Sale[1]

[1]Institute of Health Policy, Management & Evaluation, Univ. of Toronto, Toronto, Canada, [2]Dept. of Surgery, Aga Khan Univ., Karachi, Pakistan

Objective: This review seeks to evaluate the proportion of fragility fracture patients screened in secondary fracture prevention programs who were indicated for pharmacological treatment, received prescriptions for bone-active medications, and initiated the prescribed medication. Additionally, the study aims to analyze equity in pharmacological treatment by examining various equity-related variables including age, sex, gender, race, education, income, and geographic location.

Methods: We conducted a systematic review to ascertain the proportion of fragility fracture patients indicated for treatment who received prescriptions and/or initiated bone-active medication through secondary fracture prevention programs. We also examined treatment indications reported in studies and eligibility criteria to confirm patients who were eligible for treatment. To compute the pooled proportions for medication prescription and initiation, we carried out single group proportional meta-analysis. We also extracted the proportions of patients who received prescription and/or began treatment based on age, sex, race, education, income, location, and chronic conditions.

Results: This review includes 122 studies covering 114 programs. The pooled prescription rate was 77%, and the estimated medication initiation rate was 71%. Subgroup analysis revealed no significant difference in treatment initiation between the Fracture Liaison Service and other programs. Across all studies, age, sex, and economic status were the consistent equity variables reported in relation to treatment outcomes. Our data indicated no age-specific or income-related differences in the treatment proportions. Nine studies examined sex-related differences, and 44% of them found that females tended to be more likely to receive prescription and/or initiate treatment compared to men.

Conclusion: This review identified and described 122 studies encompassing 114 secondary fracture prevention programs. The pooled proportions for treatment outcomes may not fully reflect the targets reached by various programs. However, computing treatment proportions for eligible patients allowed us to compare them with international standards. The present review emphasizes the need for standardized reporting guidelines in post-fracture interventions. A thorough documentation of study population and treatment proportions would improve the applicability of findings. Moreover, considering equity stratifiers in the analysis of post-fracture outcomes will help address inequities and improve the overall quality of programs.

P102
THE ASSOCIATION BETWEEN MULTIMORBIDITY AND TREATMENT OF HIGH RISK FRAGILITY FRACTURE PATIENTS IN AN ONTARIO COORDINATOR-BASED FRACTURE SCREENING PREVENTION PROGRAM

A. A. Ali[1], E. H. Huszti[1], S. N. Noordin[2], J. S. Sale[1]

[1]Institute of Health Policy, Management & Evaluation, Univ. of Toronto, Toronto, Canada, [2]Dept. of Surgery, Aga Khan Univ., Karachi, Pakistan

Objective: This study investigated the association between multimorbidity and pharmacological treatment rates in high risk patients who were screened through Ontario Coordinator-based Fracture Screening Prevention Program (FSPP).

Methods: We conducted a retrospective cohort study to determine the magnitude of association between multi-morbidity and bone-active medication prescription and initiation rates. All high risk patients who were enrolled in the FSPP and screened at one of the 40 FSPP sites between June 1, 2017, and June 30, 2022 were included in the study. The FSPP collects information on seven chronic disease categories including heart disease (stroke, heart attack), diabetes, respiratory disease (asthma, COPD, emphysema), arthritis (rheumatoid arthritis, osteoarthritis), cancer, high blood pressure, and high cholesterol. We created an ordinal variable of multimorbidity by summing the total number of chronic conditions available in the dataset. Multi-morbidity was classified into four categories: (1) no chronic condition; (2) one chronic condition; (3) two chronic conditions; and 4) three or more chronic conditions. To investigate the association between treatment rates and multimorbidity, we created multivariable logistic regression models to compute adjusted odds ratios (AOR) along with their corresponding 95% CIs.

Results: Among 27,148 patients in the FSPP during study duration, 11,245 were identified as high risk. Patients with two chronic conditions demonstrated a 26% higher odds of receiving a medication prescription, and those prescribed bone-active medications had a 57% increased odds of initiating the treatment compared to individuals without chronic conditions. Significant predictors included age, sex, marital status, and living location.

Conclusion: Our analysis did not reveal any disparities in pharmacological treatment for patients with two or more chronic conditions screened through the FSPP. Instead a greater burden of health issues was associated with an increased likelihood of receiving treatment within the FSPP. The systematic identification of high risk patients for future fractures, appeared to eliminate disparities in treatment prescription and initiation rates based on multimorbidity. This underscores the program's success in ensuring that patients with a more complex health profile, characterized by multiple chronic conditions, receive the necessary attention and care within the FSPP.

P103
PREDICTIVE VALUE OF TRABECULAR BONE SCORE ADJUSTED FRAX FOR VERTEBRAL FRACTURES IN POSTMENOPAUSAL TYPE 2 DIABETIC WOMEN: A CROSS-SECTIONAL STUDY

A. A. Mousa[1], H. Abdelhay[1], M. Roshdy[1], S. Sameh[1]

[1]Specialized Medical Hospital, Mansoura Univ., Egypt, Mansoura, Egypt

Objective: Among the several comorbidities that affect postmenopausal women with diabetes, increased fracture risk is a relatively under covered complication. Individuals with T2DM exhibit higher BMD, which complicates the assessment of fracture risk. The most frequent type of osteoporotic fractures is vertebral

fractures (VFs), and is associated with future VFs and non-VFs. We aimed to evaluate the predictive value of fracture risk assessment (FRAX) tool adjusted with TBS in assessment of postmenopausal type 2 diabetic patients with VFs.

Methods: 125 postmenopausal type 2 diabetic women from Diabetes Clinic of Specialized Medical Hospital, Mansoura Univ. were included. DXA scan on vertebrae using TBS was done. For each patient, the FRAX algorithm for major osteoporotic fracture (MOF) and for hip fracture (HF) with BMD was computed, together with TBS-adjusted FRAX.

Results: 27.2% of the patients had morphometric VFs. BMD and FRAX with BMD did not differ; while TBS and TBS adjusted FRAX was statistically higher in patients with VFs compared to those without VFs. Based on the receiver operating characteristic (ROC) curve**,** the best curves to identify subjects with VFs were: age (area under the curve (AUC) 0.64; p = 0.02, duration of menopause (AUC 0.67; p = 0.008), TBS (AUC 0.63; p = 0.03), TBS-adjusted FRAX MOF (AUC 0.64; p = 0.01 with a threshold of 3%) and TBS-adjusted FRAX HF (AUC 0.63; p = 0.04 with a threshold of 20%).

Table 1. Characteristics associated with vertebral fractures in postmenopausal diabetic patients

Characteristics	Patients with VFs	Patients with no VFs	P value
Number (%)	34(27.2)	91(72.8)	
Age (y)	65 (55-79)	59 (53-61)	0.002
Duration of menopause (y)	16 (10-25)	13 (4-29)	<0.005
Duration of diabetes (y)	18(12-22)	14(10-21)	0.016
History of non VFs (%)	17.6	16.4	0.181
BMI (kg/m^2)	30.1 (26.4-33.9)	32.8 (22.6-45.7)	0.279
HbA1c (%)	8.2 (7.8-9.3)	7.9 (6.4-9.5)	0.637
Lumbar spine, T-score	−1.93±0.99*	−1.81± 1.18*	0.338
Lumbar spine BMD, g/cm^2	0.82± 0.11*	0.85±0.13*	0.944
Femoral neck, T-score	−2.04±(0.93*	−1.93 ±0.77*	0.817
Femoral neck BMD (g/cm^2)	0.62± 0.11*	0.63 ±0.10*	0.078
FRAX-MOPF (%)	4.9 (2.9-8.9)	4.6 (1.2-11.5)	0.788
FRAX-HF (%)	1.84±2.52*	2.08±2.92*	0.590
TBS	1.132 (1.109–1.154)	1.200 (1.192–1.207)	<0.0001
TBS adjusted FRAX-MOPF (%)	7.9 (5.3-16.5)	5.5 (4.1- 8.7)	0.002
TBS adjusted FRAX-HF (%)	5.36±6.27*	2.39±2.20*	<0.001

Data are presented as the median (Q1, Q3) or as mean±standard deviation*
BMD=bone mineral density, BMI=body mass index, FRAX-HF=10-y probability of hip fracture by fracture risk assessment tool, FRAX-MOF=10-y probability of major osteoporotic facture by fracture risk assessment tool, TBS=trabecular bone score, VF=vertebral fracture

Table 2. Area under the curve (AUC), sensibility and specificity for ROC curves that identify subjects with vertebral fractures (p value<0.05)

	Sensitivity (%)	Specificity (%)	AUC (95%CI)	p value
Age (y)	50	76	0.64 (0.52–0.76)	0.02
Duration of menopause (y)	40.6	89.6	0.67 (0.54–0.79)	0.008
Duration of diabetes (y)	23.3	66	0.62 (0.51–0.78)	0.01
TBS	31.6	84	0.63 (0.51–0.76)	0.03
TBS adjusted FRAX-MOPF (%)	51	94.5	0.64 (0.52–77)	0.01
TBS adjusted FRAX-HF (%)	22	75	0.63 (0.50–0.75)	0.04

FRAX-HF=10-y probability of hip fracture by fracture risk assessment tool, FRAX-MOF=10-y probability of major osteoporotic facture by fracture risk assessment tool, TBS=trabecular bone score.

Conclusion: TBS, TBS-adjusted FRAX MOF and TBS-adjusted FRAX HF but not FRAX with BMD could identify vertebral fractures in postmenopausal diabetic women.

P104
COGNITIVE IMPAIRMENTS IN RHEUMATOID ARTHRITIS PATIENTS RECEIVING ADEQUATE PSYCHOPHARMACOTHERAPY OF ANXIETY AND DEPRESSIVE DISORDERS: OUTCOMES OF THE 5-YEAR PROSPECTIVE STUDY

A. Abramkin[1], T. Lisitsyna[1], D. Veltishchev[2], O. Seravina[2], O. Kovalevskaya[2], S. Glukhova[1], E. Nasonov[1]

[1]V.A. Nasonova Research Institute of Rheumatology, [2]Moscow Research Institute of Psychiatry, Serbsky NMRC PN MoH, Moscow, Russia

Objective: To assess the baseline rates and 5-y outcomes of cognitive impairments (CI) in patients with rheumatoid arthritis (RA) and comorbid anxiety and depressive disorders (ADD) receiving conventional antirheumatic drugs and biologics with or without adequate psychopharmacotherapy (PPT) in 5-y prospective study. To compare clinical, demographical characteristics, ADD severity and prevalence in RA patients depending on CI outcomes.

Methods: 128 RA-patients (pts) were enrolled, 86% were women with a mean age of 47.4 ± 11.3 (M ± SD) y. All pts met the full ACR criteria for RA. Disease activity was assessed using DAS28, mean RA activity was high (5.27 ± 1.78) at baseline. ADD were diagnosed in 123 (96.1%) of RA-pts in accordance with ICD-10 in semistructured interview by a licensed psychiatrist. Severity of depression and anxiety was evaluated with MADRS and HAM-A. CI were diagnosed during clinical and psychological examination using the battery of pathopsychological and projective techniques including remembering the ten words, indirect (relational) memorization with pictograms, incomplete-sentence test, Wechsler scale, Raven's Progressive Matrices. According to test results, CI were classified as memory deficit (mechanical and/or or relational), impaired logical thinking (distortion, decrease of generalization process), impairments in memory and logical thinking or normal cognitive function. Patients missing 1 or more cognitive test results were excluded from the analysis. Biologics treatment duration varied from 1 to 6 y, antidepressants from 6–96 weeks. CI outcomes were considered favourable in cases with no CI diagnosed throughout the study or in cases of reversal of cognitive impairments (memory and/or logical thinking). Cases with CI remained unchanged throughout the study or CI newly diagnosed after 5 y were considered unfavourable. RA-pts with ADD were divided into the following treatment groups: 1—conventional disease-modifying antirheumatic drugs (DMARDS) (n = 39), 2—DMARDs + PPT (sertraline or mianserine) (n = 43), 3—DMARDs + biologic DMARDs (bDMARDS) (n = 32), 4—DMARDs + bDMARDs + PPT (sertraline or mianserine) (n = 9).

Results: At baseline CI were diagnosed in 25 (64.1%) patients in 1st group, 35 (81.4%) in 2nd, 24 (75%) in 3rd and 6 (66.7%) in 4th. At 5-y endpoint 83 RA-pts were assessed, 18 cases excluded due to absence of one or more cognitive tests performed, 65 included in analysis (1st group—22, 2nd—14, 3rd—20, 4th—9). 16 cases were considered as favourable outcomes (18.2%, 35.7%, 15% and 44.4% for groups 1–4 respectively, $p > 0.05$), 49 as unfavourable. Total percent of favourable outcomes was significantly higher in PPT (2 and 4) than in no PPT (1 and 3) groups (39.1 vs. 16.7%, p = 0.045, RR 1.97, 95% CI 0.61–6.32). Patients with favourable vs. unfavourable CI outcomes had similar clinical and demographical characteristics, including disease activity, CRP level,% of extraarticular RA manifestations, GC usage, but were characterised by lower major depression prevalence (12.5 vs. 46.9%), lower baseline depression levels by Montgomery–Asberg scale (18 ± 6.7 vs. 21.6 ± 6.9), major decrease of depression symptoms after 5 y (− 6.5 [− 11.0; − 4.0] vs. − 1.0 [− 8.0; 1.0]), higher rates of remission of anxiety and depressive symptoms after 5 y (44 vs. 12.8%, $p < 0.05$). Favourable CI outcomes significantly correlated with remission of

anxiety and depressive symptoms at 5-y follow-up (r-Spearman's 0.35, p = 0.002).
Conclusion: CI rates are associated with depression levels and tend to remain unchanged or deteriorate in a majority of RA patients with ADD in long-term perspective. Adequate PPT and remission of ADD symptoms is associated with favourable CI outcomes after 5 y.

P105
MEMORY IMPAIRMENT IN PATIENTS WITH RHEUMATOID ARTHRITIS WITH COMORBID ANXIETY AND DEPRESSIVE DISORDERS

A. Abramkin[1], T. Lisitsyna[1], D. Veltishchev[2], O. Seravina[2], O. Kovalevskaya[2], S. Glukhova[1], E. Nasonov[1]

[1]V.A. Nasonova Research Institute of Rheumatology, [2]Moscow Research Institute of Psychiatry, Serbsky NMRC PN MoH, Moscow, Russia

Objective: To assess the baseline rates and 5-y outcomes of cognitive impairments (CI), including memory loss, in patients with rheumatoid arthritis (RA) and comorbid anxiety and depressive disorders (ADD) receiving conventional antirheumatic drugs and biologics with or without adequate psychopharmacotherapy (PPT) in 5-y prospective study. To assess factors associated with impaired memory after 5 y.
Methods: 128 RA-patients (pts) were enrolled, 86% were women with a mean age of 47.4 ± 11.3 (M ± SD) y. All pts met the full ACR criteria for RA. Disease activity was assessed using DAS28, mean RA activity was high (5.27 ± 1.78) at baseline. ADD were diagnosed in 123 (96.1%) of RA-pts in accordance with ICD-10 in semi-structured interview by a licensed psychiatrist. Severity of depression and anxiety was evaluated with MADRS and HAM-A. CI were diagnosed during clinical and psychological examination using the battery of pathopsychological and projective techniques including remembering the ten words, indirect (relational) memorization with pictograms, incomplete-sentence test, Wechsler scale, Raven's Progressive Matrices. According to test results, CI were classified as memory deficit (mechanical and/or or relational), impaired logical thinking (distortion, decrease of generalization process), impairments in memory and logical thinking or normal cognitive function. Patients missing 1 or more cognitive test results were excluded from the analysis. Biologics treatment duration varied from 1–6 y, antidepressants from 6 to 96 weeks. RA-pts with ADD were divided into the following treatment groups: 1—conventional disease-modifying antirheumatic drugs (DMARDs) and/or biologic DMARDs (bDMARDS) and no PPT (n = 71), 2—DMARDs and/or bDMARDs + PPT (sertraline or mianserine) (n = 52). Stepwise logistic regression analysis was performed to assess factors associated with memory deficits after 5 y.
Results: At baseline CI were diagnosed in 90 (73.2%) patients, 49 (69%) patients in 1st group and 41 (78.9%) in 2nd, difference between groups nonsignificant. Logical thinking was impaired in 36 (50.7%) vs. 27 (51.9%), memory in 44 (62%) vs. 39 (75%), including mechanical memory deficit in 4 (5.6%) vs. 1 (1.9%), relational memory deficit in 17 (23.9%) vs. 18 (34.6%), impairments in both mechanical and relational memory in 23 (32.4%) vs. 20 (38.5%), combined memory and logical thinking impairments in 31 (43.7%) vs. 23 (44.2%) for 1st and 2nd groups respectively, $p > 0.05$. At 5-y endpoint, 83 RA-pts were assessed and 74 (42 in 1st group and 32 in 2nd) included in analysis. After 5 y, CI rates in 1st (no PPT) group increased from 69 to 85.7% and in 2nd (PPT) decreased from 78.9% to 62.5%, between-group significance p = 0.021 (85.7% vs. 62.5%, RR 1.93, 95% CI 0.63–5.9). Rates of logical thinking impairments in both groups increased (from 50.7 to 69.1% in 1st group and from 51.9 to 59.4% in 2nd), mechanical memory remained unchanged 3 (7.1%) vs. 1 (3.1%), relational memory deficit remained in 1st and decreased in 2nd group, 10 (23.8%) vs. 6 (18.8%), mechanical and relational memory deficit increased in 1st and decreased in 2nd group. 20 (47.6%) vs. 10 (31.3%), total memory deficit rates slightly increased in 1st group (from 62 to 78.6%, $p > 0.05$) and significantly decreased in 2nd (from 75 to 53.1%, p = 0.034), significance between groups p = 0.041 (78.6% vs. 53.1%, RR 1.56, 95% CI 0.59–4.13). According to univariate logistic regression, age, major depression, cholesterol level, longer duration of depression symptoms were positively associated, and RF, ACCP, anxiety spectrum disorders, baseline hemoglobin level, anxiety level (HAM-A score) and remission of depression symptoms after 5 y were negatively associated with memory deficit after 5 y ($p < 0.3$). These variables were subjected to multivariate logistic regression: cholesterol level were positively associated (OR 2.1, 95% CI 1.2–3.6, $p < 0.001$) while hemoglobin levels (OR 0.98, 95% CI 0.96–1.0, p = 0.08) and remission of anxiety and depression symptoms (OR 0.18, 95% CI 0.05–0.62, $p < 0.001$) negatively associated with memory impairments after 5 y.
Conclusion: Memory deficit, along with impaired logical thinking, is highly prevalent in RA patients with comorbid ADD. Rates of logical thinking impairments tend to increase in most patients and remain stable in antidepressants treated group. Memory function shows improvement after PPT and remission of ADD symptoms. Multiple regression shows cholesterol levels to be associated with higher risk of memory impairments after 5 y, and PPT and hemoglobin levels to be associated with lower risk. PPT of ADD and hemoglobin levels may play a protective role in regulation of memory function in RA patients with ADD.

P106
LOGICAL THINKING IMPAIRMENTS IN PATIENTS WITH RHEUMATOID ARTHRITIS WITH COMORBID ANXIETY AND DEPRESSIVE DISORDERS

A. Abramkin[1], T. Lisitsyna[1], D. Veltishchev[2], O. Seravina[2], O. Kovalevskaya[2], S. Glukhova[1], E. Nasonov[1]

[1]V.A. Nasonova Research Institute of Rheumatology, [2]Moscow Research Institute of Psychiatry, Serbsky NMRC PN MoH, Moscow, Russia

Objective: To assess the baseline rates and 5-y outcomes of cognitive impairments (CI), including logical thinking impairments, in patients with rheumatoid arthritis (RA) and comorbid anxiety and depressive disorders (ADD) receiving conventional antirheumatic drugs and biologics with or without adequate psychopharmacotherapy (PPT) in 5-y prospective study. To assess factors associated with logical thinking impairments after 5 y.
Methods: 128 RA-patients (pts) were enrolled, 86% were women with a mean age of 47.4 ± 11.3 (M ± SD) y. All pts met the full ACR criteria for RA. Disease activity was assessed using DAS28, mean RA activity was high (5.27 ± 1.78) at baseline. ADD were diagnosed in 123 (96.1%) of RA-pts in accordance with ICD-10 in semi-structured interview by a licensed psychiatrist. Severity of depression and anxiety was evaluated with MADRS and HAM-A. CI were diagnosed during clinical and psychological examination using the battery of pathopsychological and projective techniques including remembering the ten words, indirect (relational) memorization with pictograms, incomplete-sentence test, Wechsler scale, Raven's Progressive Matrices. Patients missing 1 or more cognitive test results were excluded from the analysis. CI were classified as logical thinking impairments (distortion, decrease of generalization process), memory deficit (mechanical and/or or relational) or combined memory and logical thinking impairments. Biologics treatment duration varied from 1–6 y, antidepressants from 6–96 weeks. RA-pts with ADD were divided into the following treatment groups: 1—conventional disease-modifying antirheumatic drugs (DMARDs) and/or

biologic DMARDs (bDMARDS) and no PPT (n = 71), 2—DMARDs and/or bDMARDs + PPT (sertraline or mianserine) (n = 52).

Results: At baseline CI were diagnosed in 90 (73.2%) patients, 49 (69%) patients in 1st group and 41 (78.9%) in 2nd, difference between groups nonsignificant. Logical thinking was impaired in 36 (50.7%) vs. 27 (51.9%), memory in 44 (62%) vs. 39 (75%), and combined memory and logical thinking impairments—31 (43.7%) vs. 23 (44.2%) for 1st and 2nd groups respectively, $p > 0.05$. At 5-y endpoint, 83 RA-pts were assessed and 74 (42 in 1st group and 32 in 2nd) included in analysis. After 5 y. CI rates in 1st (no PPT) group increased from 69 to 85.7% and in 2nd (PPT) decreased from 78.9% to 62.5%, between-group significance p = 0.021 (85.7 vs. 62.5%, RR 1.93, 95% CI 0.63–5.9). Rates of logical thinking impairments in both groups increased (from 50.7 to 69.1% in 1st group and from 51.9 to 59.4% in 2nd), memory loss slightly increased in 1st group (from 62 to 78.6%, $p > 0.05$) and significantly decreased in 2nd (from 75 to 53.1%, p = 0.034), significance between groups p = 0.041 (78.6 vs. 53.1%, RR 1.56, 95% CI 0.59–4.13). According to univariate logistic regression, female gender, DAS28, cholesterol levels, myocardial infarction in anamnesis, major depression (against minor depression and anxiety disorders), baseline depression severity (MADRS score), lower baseline anxiety levels (HAM-A score) and nonremission of depression symptoms after 5 y were associated with logical thinking impairments after 5 y ($p < 0.3$). These variables were subjected to multivariate logistic regression: only baseline major depression was associated with logical thinking impairments after 5 y (OR 3.17, 95% CI 1.265–7.929, p = 0.014).

Conclusion: CI are highly prevalent in RA patients with comorbid ADD. While CI rates tend to deteriorate in most patients, PPT and remission of ADD symptoms is associated with improvement in memory function, but not in logical thinking. Only major depression was independently associated with logical thinking impairment after 5 y.

P107
IS DEPRESSION ASSOCIATED WITH DIFFICULT TO TREAT RHEUMATOID ARTHRITIS?

A. Abramkin[1], T. Lisitsyna[1], D. Veltishchev[2], O. Seravina[2], O. Kovalevskaya[2], A. Borisova[1], S. Glukhova[1], E. Nasonov[1]

[1]V.A. Nasonova Research Institute of Rheumatology, [2]Moscow Research Institute of Psychiatry, Serbsky NMRC PN MoH, Moscow, Russia

Objective: To compare demographical characteristics, disease activity, patient-reported outcomes and depression severity in rheumatoid arthritis (RA) patients with depression with or without difficult-to-treat RA (D2T RA) and patients with no depression and no D2T RA. To determine factors associated with D2T RA phenotype.

Methods: 92 RA-patients were enrolled, all met the full ACR criteria for RA and were resistant to conventional DMARDs, 11 met EULAR definition for difficult-to-treat RA. Disease activity was assessed using DAS28 in all patients, functional limitations with HAQ questionnaire, fatigue with FSS scale, quality of life with EQ-5D scale, pain intensity with VAS pain, depression severity with PHQ-9 questionnaire. Depressive disorders were diagnosed in 84 (91.3%) of patients in accordance with ICD-10 in semistructured interview by a licensed psychiatrist. Patients were divided into the following treatment groups: 1—depression + D2T RA (n = 11), 2—depression and no D2T RA (n = 73), 3—no D2T RA and no depression (n = 8). Linear regression analysis was performed to determine factors associated with D2T subgroup of RA patients.

Results: Depression + D2T patients (group 1) were characterized by longer RA duration, higher RF titer, GC treatment duration, cumulative GC dosage, PGA, EGA, pain VAS, FSS and HAQ scores, the lowest quality of life (Table 1). Nondepressed patients with no D2T (group 3) had the lowest PGA, EGA, pain VAS and FSS scores. Depressed patients with no D2T (group 2) were older compared to groups 1 and 3 and demonstrated the interim results for the rest of the variables assessed. According to correlation analysis, age, RA duration, BMI, GC usage and depression severity by PHQ-9 score correlated with D2T subgroup of RA patients (Pearson's $R > 0.1$). Those variables were subjected to linear regression analysis. According to multinominal linear regression, age (B = 0.3), PHQ-9 (B = 0.31) score and GC usage (B = 0.4) were significantly associated with D2T subtype of RA, $R^2 = 0.189$, $p < 0.005$, ROC-curve AUC 0,74, $p < 0.005$.

Table 1. Clinical and demographical characteristics of RA patients by groups.

	Group 1 (depression+D2T), n=11	Group 2 (depression, no D2T), n=73	Group 3 (no depression, no D2T), n=8	Between-group difference (p)
Age	34 [30; 46]	52 [40; 59]	36 [30; 41]	P2-1, 2-3 <0,05
RA duration (months)	120 [72; 144]	60 [30; 120]	72 [60; 216]	P1-2, 1-3 <0,05
BMI	23,5 [18,3; 26,8]	25,2 [22; 30,5]	23,8 [18; 27,3]	P>0,05
RF (IU/ml)	122,5 [9,1; 261]	53,5 [10,6; 175]	42,3 [13,2; 148,9]	P1-3<0,05
Duration of GC usage (months)	46 [23; 72]	13,5 [4,5; 44]	9,8 [0; 132]	P1-2<0,05
Cumulative GC dosage (g)	6,3 [3,9; 16,2]	2,4 [0,75; 7,65]	2,925 [0; 41,6]	P1-2<0,05
Morning stiffness duration (h)	105 [60; 180]	120 [60; 180]	45 [20; 300]	P>0,05
SJC	8 [6; 10]	9 [6; 11]	7 [3; 15]	P>0,05
PJC	10 [8; 17]	12 [10; 18]	11 [7; 18]	P>0,05
PGA VAS	72 [60; 80]	60 [50; 70]	45 [40; 50]	P1-3, 2-3<0,05
EGA VAS	50 [50; 60]	58 [50; 60]	40 [35; 45]	P1-3, 2-3<0,05
Pain VAS	79 [50; 80]	70 [50; 80]	50 [40; 60]	P1-3, 2-3<0,05
DAS 28	5,7 [5,2; 6,25]	5,9 [5,3; 6,35]	5,22 [4,18; 6,83]	P>0,05
SDAI	33,4 [28,2; 42]	36,7 [29,6; 44]	27,1 [22,2; 35,4]	P>0,05
CRP (mg/l)	30,4 [12,3; 49,6]	27,5 [17,8; 49]	20,1 [18,3; 30,6]	P>0,05
ESR (mm/h)	56 [35; 66]	46 [28; 72]	34 [25; 40]	P>0,05
EQ-5D	0 [-0,02; 0,59]	0,52 [0,08; 0,59]	0,55 [0,26; 0,59]	P1-2, 1-3<0,05
FSS	5,84 [3,8; 6,78]	5,22 [3,9; 6,11]	3,4 [3; 4,1]	P1-3, 2-3<0,05
HAQ	1,75 [1; 2]	1,375 [1; 1,875]	1,188 [0,5; 1,5]	P1-3<0,05
PHQ-9	11 [6; 17]	8 [5; 12]	5,5 [3,25; 8,5]	P1-3<0,05

Conclusion: D2T RA subtype is mostly characterized by demographic variables (age, RA duration), patient-reported outcomes (quality of life, functional limitation, global health VAS) and depression level (PHQ-9), not clinical disease activity indexes and/or CRP level. Regression model shows younger, GC usage and depression level by PHQ-9 to be associated with D2T RA. Psychopharmacotherapy of depression may show potential to improve PROs and improve RA treatment response.

P108
NUMERICAL-DIGITAL APPROACH FOR BONE PROPERTIES EVALUATION

O. Gerasimov[1], A. Akhmetzyanova[1], K. Sharafutdinova[1], D. Sabirova[1], M. Baltin[1], T. Baltina[1], O. Sachenkov[1]

[1]Kazan Federal Univ., Kazan, Russia

Objective: To develop numerical-digital approach for bone properties evaluation. Such approach allows estimating stress–strain state of bone and even specifying bone tissue Young's modulus using CT data. In contrast to common approaches, the proposed method does not require reconstruction of bone geometry.

Methods: The approach is based on finite element method. An eight node hexahedral element with linear approximation was modified. CT data was used as an objects digital prototype [1]. So, hexahedral elements stiffness matrix was integrated regarding to CT data [2]. Meshing of the study area can be easily built by filtering the circumscribed regular mesh [3]. Fore and hind limbs of male Vietnamese swine with 8th week spinal cord injury (SCI) were investigated.

Results: Numerical results showed a significant difference in the mechanical behavior of the forelimbs and hind limbs. So, the restored Young's modulus was about 2.57 ± 0.1GPa and 1.12 ± 0.11 GPa, respectively. To validate results the bones was tested in the same conditions as in numerical simulation. Then stress–strain curve was built and compared to numerical stress–strain curve. Coefficient of determination was equal to 0.9985.
Conclusion: CT based simulation is gold standard in modern biomechanics. But, reconstruction of bone geometry and further meshing is labor-intensive process. Proposed approach allows reducing the preparing model time. Moreover the modified finite element allows taking into account structural anisotropy in simulation, and this explains the good agreement with experiment.
References:

1. Gerasimov OV, et al. Russ. J. Biomech 2019;23:104
2. Gerasimov OV, et al. Front. Mech. Eng 2021;7:688474
3. Gerasimov OV, et al. Lect Notes Comp Sci Eng 2022;141:125

Acknowledgment: The research was funded by the subsidy allocated to Kazan Federal Univ. for the state assignment in the sphere of scientific activities, project No. FZSM-2023–0009.

P109
HIGH PREVALENCE OF SARCOPENIA IN OLDER PATIENTS WITH TYPE 2 DIABETES MELLITUS IN SAUDI ARABIA: A CROSS-SECTIONAL STUDY

A. Alfaifi[1], M. Almalki[2], U. Almohareb[1], I. Brema[1], A. Alobedollah[1], S. Abdulhamid[3], F. Alshahrani[4], M. Almohaya[1]

[1]Obesity, Endocrine and Metabolism Center, King Fahad Medical City, Second Health Cluster, [2]Obesity, Endocrine and Metabolism Center, King Fahad Medical City, Second Health Cluster. College of Medicine, Alfaisal Univ., [3]Research Center, King Fahad Medical City, [4]College of Medicine, King Saud Bin Abdulaziz Univ. for Health Sciences, Riyadh, Saudi Arabia

Objective: Sarcopenia is prevalent amongst the geriatric population, and confers a risk of physical disability, diminished quality of life, and increased mortality. Previous evidence showed a wide range of prevalence in patients with type 2 diabetes mellitus (T2DM), ranging from 7–30% in different populations; local studies about its prevalence are lacking. We aimed to estimate the prevalence of sarcopenia among older patients with T2DM in Saudi Arabia.
Methods: We prospectively evaluated patients treated for T2DM at a tertiary center in Riyadh, Saudi Arabia. Muscle strength assessed using hand grip testing (Jamar Plus dynamometer) and physical performance tested by a 4 m walk gait speed test. Appendicular skeletal muscle index (ASMI) by body composition using DXA machine. Sarcopenia definition and cut-off values of each category were applied according to the EWGSOP2 recommendations.
Results: Total of 75 patients with T2DM were included (37 females, 38 males). Mean age 60 y ± 5 and mean diabetes duration of 15 y (mean HgbA1C of 8.1% ± 1.4%). Low hand grip strength observed in 65.7% of males and 70% of females. A 69% of males and 88.5% of females showed poor physical performance. Interestingly, males had a significant lower muscle mass ASMI (kg/m^2) compared to females (35.7 vs. 5.7%, p-value 0.004) when EWGSOP2 cut-off values applied. In 41.6% of males and 60% of females, sarcopenia has been confirmed by presence of two criteria according to EWGSOP2 definition.
Conclusion: These data indicate high prevalence of sarcopenia in older patients with T2DM in Saudi Arabia. Clinicians need to be aware about these associations and its risk factors. This will allow early recognition and addressing appropriate therapeutic strategies to prevent further negative consequences.

P110
FRACTURE LIAISON SERVICE IN DUBAI HEALTH

A. Alshaali[1], S. Abd El Aziz[1], A. Aljaziri[1], M. Elsherbiny[1], T. Farid[1], M. Hammam[1], M. Elnoamani[1]

[1]Dubai Health, Dubai, United Arab Emirates

Osteoporosis is a disease classified by the alteration of bony microarchitecture and the loss of its structural integrity and predisposition to fracture. Following an osteoporotic fracture, it is common to have a second fracture referred to as a secondary fracture. Secondary fracture prevention remains a major problem in most countries following the treatment of hip fracture, vertebral fracture, distal radius fracture, proximal humerus fracture, and other fragility fractures. A systematic review showed that fracture liaison services from Arab countries are still lacking and such service will help in closing the gap for prevention and management of secondary fracture. A Fracture Liaison Service (FLS) has started in Dubai Health in February 2023. It aims to screen patient with fragility fracture for osteoporosis and provide appropriate management.

P111
CLINICAL AND DENSITOMETRIC RESPONSE TO BISPHOSPHONATE THERAPY IN OSTEOPOROSIS PSEUDOGLIOMA SYNDROME: CASE REPORT

A. Alturkistani[1], M. Almohaya[1]

[1]Obesity, Endocrine and Metabolism Center, King Fahad Medical City, Riyadh, Saudi Arabia

Osteoporosis pseudoglioma syndrome (OPPG) is a rare autosomal recessive disease caused by mutation in gene LRP5 (LDL receptor-related protein) on chromosome 11q13.4. This protein helps in regulation of BMD and development of retina. Patient with OPPG usually present with decrease bone density and early onset of blindness.

We report the clinical, radiological and genetic findings of patient with OPPG in Saudi Arabia, and also we highlight the clinical and densitometric improvement observed with bisphosphonate administration.

A 14-year-old male was referred to the metabolic bone clinic for further evaluation of low-trauma multilevel severe vertebral compression fractures. He was born with severe visual impairment of both eyes. He is offspring of non-consanguineous parents and family history was unremarkable. Workup for other secondary causes of low bone mass was normal. CT scan demonstrated severe diffuse bone demineralization with multilevel non-acute compression fractures. DXA scan showed BMD of lumbar spine (L1–L4) 0.726 g/cm^2, BMD of dual femur neck mean 0.751 g/cm^2 and BMD of dual femur total mean = 0.697 g/cm^2. Genetic testing showed mutation in exon 6 LRP5 gene (homozygous) that is confirmed the diagnosis of OPPG. Oral alendronate 70 mg weekly was initiated in 2019. After 2 y of oral bisphosphonate therapy, his BMD values improved significantly by 9.5% in lumbar spine area, 9.8% in total dual femur areas. Later, BMD values declined by 3.8% at lumbar spine area due to compliance issues and lack of supply, therefore patient was switched to zoledronic acid 5 mg yearly. Patient continued to have an increase in his BMD values (increased by 7% in lumbar spine and 10.5% in total dual femur areas) over 2 y administration of zoledronic acid with no reported adverse events.

This is the first reported case of OPPG in Saudi Arabia. Long term bisphosphonate therapy showed clinical and densitometric improvement. These clinical and radiological findings may help the clinicians to consider OPPG in the differential diagnosis of young patients with fractures and congenital visual impairment and to consider an early intervention with bisphosphonate therapy.

P112
ASYMPTOMATIC HYPOPHOSPHATASIA: A CLINICAL CASE REPORT

A. Asanova[1], E. Drachuk[1], E. Pigarova[1], L. Dzeranova[1]

[1]Endocrinology Research Centre, Moscow, Russia

Hypophosphatasia is a rare hereditary metabolic disease caused by alkaline phosphatase (ALP) deficiency as a result of a mutation in the *ALPL* gene, which is accompanied by impaired bone mineralization and musculoskeletal manifestations in the form of bone deformities, frequent fractures, tooth loss, bone and muscle pain, decrease in muscle strength. The disease can manifest in utero, in childhood or in adulthood. An early age of onset is usually associated with a more severe disease, and a late age—with a mild course of the disease. Relatively little data is available on the prevalence and clinical features of hypophosphatasia in adults.

Casereport: An 18-year-old female (weight 56 kg, height 160 cm, BMI 21.9) with complaints of general weakness and dizziness, pain in the legs and joints, periodic darkening in the eyes, itching of the knuckles. Development in childhood and adolescence proceeded without any special features. Considers herself sick since the age of 16, when swelling and tenderness of the left ankle and knee joints appeared without x-ray changes. At the same time, the patient was diagnosed with infectious mononucleosis, after which she noted an increase in general weakness, periodic increases in body temperature in the mornings and evenings to 37.2 °C, loss of appetite, lightheadedness, pain in the bones and joints. When examining CRP, ASLO, RF—negative, biochemical indicators, parameters of bone and calcium-phosphorus metabolism were normal except for the detected decrease in ALP to 13–15 U/l (40–150) and a pronounced deficiency of vitamin D—9 ng/ml (30–100). The diagnosis of hypophosphatasia was confirmed genetically—a pathogenic nucleotide variant chr1:21563115C>A was detected in a heterozygous state in the ALPL gene. According to X-ray densitometry of the whole body, BMD, taking into account the skull, corresponds to the age norm: − 0.5 SD (according to the Z-criterion); BMD excluding the skull corresponds to the age norm: − 0.7 SD (according to the Z-criterion). According to lateral morphometry, no data were obtained for vertebral deformities and compression fractures. There were no fractures. Teeth, hair, nails—without any features. A detailed collection of family history revealed similar symptoms of joint pain in the mother with a decrease in ALP to 20 U/l (35–105).

Conclusion: Despite the low activity of alkaline phosphatase, the patient does not have the characteristic clinical manifestations of hypophosphatasia (mild form), which can be confirmed by the absence of manifestations in the mother. The regarded symptoms may also be a consequence of previous mononucleosis. The influence of other genetic, epigenetic or non-genetic factors on the course of the disease may explain cases in which it is difficult to establish a relationship between the genotype and phenotype of a given pathology.

P113
LUPUS NEPHRITIS: IS THE KIDNEY BIOPSY CURRENTLY NECESSARY IN THE MANAGEMENT OF LUPUS NEPHRITIS?

A. Aseeva[1], Y. Nikishina[1], K. Solovyev[1]

[1]Federal State Research Institution (FSRI) named after V. A. Nasonova, Dept. of SLE, Moscow, Russia

Objective: Lupus Nephritis (LN) is an immune-complex mediated glomerulonephritis affecting up to 60% of all SLE patients during the disease course. A kidney biopsy is indicated in SLE patients when proteinuria stably reaches or overcomes the level of 500 mg/24 h or spot urine protein to creatinine ratio (UPCR) > 500 mg/g (50 mg/mmol), especially with impaired renal function or active urinary sediment, and is generally recommended to evaluate the inflammatory findings but also to rule out other etiologies of renal involvement and to guide the need of immunosuppressive therapy. We aimed to investigate the histopathologic findings in first-time renal biopsies from SLE patients and evaluate the type and occurrence of histopathological findings other than LN as these may lead to a risk of inadequate therapeutic interventions.

Methods: 64 SLE patients who had a first-time onset of renal involvement from 24/11/2020 up to 24/10/2022 and subsequent renal biopsy were included in the study. All patients fulfilled the Systemic Lupus Erythematosus International Collaborating Clinics (SLICC) disease classification criteria (1) for SLE and were biopsied on clinical indication, i.e., proteinuria > 0.5 g/d or active SLE in combination with a rise in plasma creatinine, decrease in glomerular function or new onset proteinuria with concurrent active urine sediment.

Results: In total, 64 patients (female 51 (76%), Male (15 (24%) with first time presentation of renal involvement who had been subject to renal biopsy were included. The median age at the time of biopsy was 35.34 ± 11.19 y. For more patient baseline characteristics (Table 1). Fifty-two (81%) had findings consistent with LN according to ISN/RPS classification system [2]. Four patients (6%) had Class I–II, 19 (30%)—Class III, 13 (20%)—Class IV, 8 (12%)—Class V, 2 (3%)—Class VI, 3 (4%)—Class III ± V, 3 (4%—Class IV ± V. Twelve patients (19%) did not have histological changes in accordance with LN. Of these, 3 had thrombotic microangiopathy, 5 had IgA nephropathy, 4 were later found to be ANCA-positive and were re-diagnosed with concomitant ANCA-associated vasculitis. Of the 12 non-LN patients, all had proteinuria > 0.5 g/day, 2 had new-onset low-grade proteinuria and concurrent active urine sediment, 2 had new-onset low-grade proteinuria with concurrent increasing SLE disease activity, and 5 patients had isolated persistent low-grade proteinuria.

Table 1. Baseline characteristics, 64 patients

Age (y) Mean (SD)	
SLE duration at biopsy (y); M (IQR)	0.7 (0.4 – 7.3)
Systolic blood pressure (mm Hg); Mean (SD)	127.5 (20.8)
Ethnicity	
Caucasian; n (%)	58 (90%)
Asian; n (%)	6 (10%)
Diagnosis according to ISN/RPS	
Class I-II	4 (6%)
Class III	19 (30%)
Class IV	13 (20%)
Class V	8 (12%)
Class VI	2 (3%)
Class III±V	3 (4%)
Class IV±V	3 (4%)
TMA	3 (4%)
Vasculitis	4 (6%)
IgA nephropathy	5 (7%)

Conclusion: We demonstrate that renal histopathology confirmed other causes than LN in a significant proportion (19%) of SLE patients with signs of renal involvement. Since these patients may need other therapeutic interventions than patients with classic LN, we can conclude that the renal biopsy is important in order to guide the choice of therapeutics.

P114
A REVIEW ON THE ASSOCIATION OF CARDIOVASCULAR LIPID PROFILE WITH OSTEOPOROSIS, BONE MINERAL DENSITY AND OSTEOPOROTIC FRACTURES

A. Auyong[1], C. S. Goh[2], S. B. Ang[3], S. D. Satvinder[3]

[1]Lee Kong Chian School of Medicine, [2]Ministry of Manpower Singapore, [3]Duke-NUS Medical School, Singapore, Singapore

Objective: This systematic review is to evaluate the association between total cholesterol (TC), triglycerides (TG), low-density lipoprotein (LDL) and high-density lipoprotein (HDL), and osteoporosis in postmenopausal women, defined by either BMD or the presence of osteoporotic fractures.
Methods: A systematic literature search was conducted in PubMed, Embase and Web of Science from inception to December 2023. Studies that met the eligibility criteria were assessed for quality and data were extracted and synthesised.
Results: 32 articles were shortlisted for analysis—23 cross-sectional studies, 8 case–control studies and 1 cohort study. LDL had the greatest association with osteoporosis, followed by HDL, then TC and TG. A positive correlation refers to an unhealthier lipid level (increased for LDL, TC and TG, decreased for HDL) correlating with lower BMD and increased osteoporosis risk. The results of the papers are as below:

Lipid Level	n	Positive Correlation (%)	Inverse Correlation (%)	No correlation (%)
LDL	28	14 (50.0%)	2 (7.14%)	12 (42.9%)
TC	28	9 (32.1%)	3 (10.7%)	16 (57.1%)
TG	29	9 (31.0%)	4 (13.8%)	16 (55.2%)
HDL	30	10 (33.3%)	4 (13.3%)	16 (53.3%)

A majority of papers were noted to contain mixed results across the different lipid levels, with few papers coming to a consensus on the association of the whole lipid profile with osteoporosis. The exclusion criteria, in terms of pre-existing medical conditions, drugs and definition of menopause also varied significantly. Stratifying results by geographical regions, outcome measure and study type did not reveal significant differences in results.
Conclusion: There is a positive correlation between an increased LDL level, and BMD and osteoporotic fractures. The relationship between HDL, TC and TG, and osteoporosis is inconclusive. Future studies might be improved through standardised population criteria and study designs, to confirm the relationship between cardiovascular lipid profile and osteoporosis.

P115
PERFORMANCE EVALUATION OF AN ARTIFICIAL INTELLIGENCE-BASED SOFTWARE FOR OPPORTUNISTIC DETECTION OF VERTEBRAL COMPRESSION FRACTURES ON CT SCANS

A. Ayobi[1], D. Chow[2], J. Soun[2], P. Chang[2], C. Castineira[1], J. Kiewsky[1], M. Mahfoud[1], C. Avare[1], Y. Chaibi[1]

[1]Avicenna.AI, La Ciotat, France, [2]Univ. of California Irvine, Irvine, USA

Objective: To evaluate the performance of an artificial intelligence (AI)-based application designed to automatically screen CT scans with unsuspected VCF in order to assist physicians in the assessments of musculoskeletal diseases.
Methods: We conducted a retrospective, multicenter and blinded study on chest-abdominal-pelvis CT scans performed for other clinical indications than for thoraco-lumbar vertebral compression fractures assessment. The ground truth (GT) was established by three senior board-certified radiologists who defined by majority agreement if the scans were positive for VCF. The same data was processed by CINA-VCF (Avicenna.AI, La Ciotat, France), an AI software intended to passively notify positive VCF cases. The sensitivity, specificity, positive and negative predictive values (PPV, NPV) were calculated and the discrepancies between the AI and the experts were analyzed. Furthermore, the cases with VCF that were not mentioned in the clinical report but that were correctly detected by the algorithm were analyzed.
Results: A total of 317 opportunistic scans were analyzed (mean age: 70.1 yo ± SD: 9.2, 51.7% female, 37.8% positive). The AI sensitivity and specificity were 92.5% [86.2–96.5%], 95.4% [91.5–97.9%], respectively. PPV and NPV were 92.5% and 95.4%. False negatives were caused by very slight compressions (n = 4), Shmorls's nodes (n = 2), uniform compressions (n = 2) and severe artifacts (n = 1). False positives were due to Schmorl's node (n = 4), disc calcifications (n = 1), L5 natural deformation (n = 1), osteophytes (n = 1), mild compressions (n = 1) and Scheuermann's disease (n = 1). An example of a true positive, false negative and false positive is shown in Fig. 1. Among the 120 positive cases according to the GT, 76/120 (63.3%) were not mentioned in the clinical report. The algorithm was capable of detecting 67/76 cases. This indicates that 55.8% (67/120) of the patients with VCF could have been additionally identified by using the AI software.

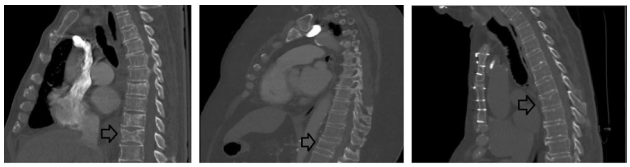


Figure 1. Example of a true positive, a false negative caused by a mild deformation and a false positive caused by a Schmorl's node.

Conclusion: This accurate AI tool may impact the early analysis of vertebral fractures, reducing the rate of undiagnosed scans. In addition, using routine CT to opportunistically detect VCF with AI may improve the diagnostic workflow of musculoskeletal diseases, such as osteoporosis.

P116
OSTEOPOROSIS AND FRACTURE RISK AFTER THE PROCEDURE IN PATIENTS UNDERGOING CHOLECYSTECTOMY: A SYSTEMATIC REVIEW AND META-ANALYSIS

A. Ghaseminejad-Raeini[1], A. Shirinezhad[1], A. Azarboo[1], K. Pirahesh[1], S. H. Hosseini-Asl[1], A. H. Hoveidaei[2]

[1]School of Medicine, Tehran Univ. of Medical Sciences, [2]Sports Medicine Research Center, Neuroscience Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Cholecystectomy has been associated with declining vitamin D absorption, raising concerns about osteoporotic fracture risk and lower BMD. There was no aggregate study to pool all the controversial findings in this regard. This study aimed to systematically review the increased incidence of osteoporosis and fracture in cholecystectomy patients.
Methods: A systematic literature search was conducted across major databases to identify relevant studies. Inclusion criteria comprised studies investigating osteoporosis and fracture outcomes in patients who underwent cholecystectomy. The Joanna Briggs Institute (JBI) Risk of Bias Tool was employed to evaluate the methodological

quality of included studies. Meta-analysis of hazard ratios was conducted when available, using R.

Results: Our search yielded 8 studies (624,290 cholecystectomy and 2,006,246 controls) meeting the inclusion criteria. The meta-analysis revealed a 1.08-fold increase in the fracture risk among post-cholecystectomy compared to normal patients. In descriptive synthesis of osteoporosis incidence, some studies showed an association with cholecystectomy (aHR [95% CI] = 1.23[1.14–1.32]). On the other hand, some studies reported the aforementioned outcomes to show no difference in cases and controls (aHR [95% CI] = 1.00 [0.97–1.03]). By the same token, BMD was lower in cholecystectomy cases (T score of femur: -0.5 ± 0.8 vs. 0.19 ± 1.1, p = 0.001—lumbar spine: -1.5 ± 1.0 vs. -0.9 ± 1.0, p = 0.004).

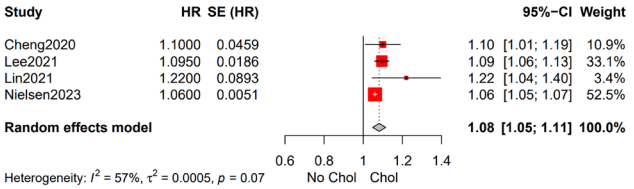


Figure 1. Fracture risk in patients having cholecystectomy compared to the normal control population.

Conclusion: Our findings suggest a significant association between cholecystectomy and increased risks of fractures. Although debatable, cholecystectomy seems to be associated with higher osteoporosis risk and worse BMD status, as it should be interpreted with caution. These findings underscore the importance of considering vitamin D supplementation and close follow-up in patients undergoing cholecystectomy, with further research warranted.

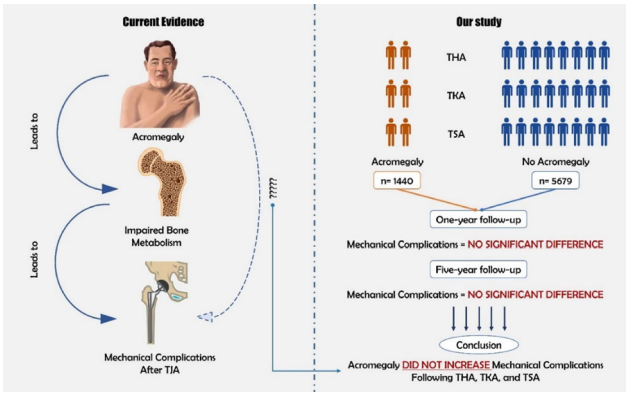
P117
MECHANICAL COMPLICATIONS AND REVISIONS IN JOINT ARTHROPLASTY FOR ACROMEGALIC PATIENTS: A MATCHED-CONTROL NATIONWIDE STUDY

J. D. Conway[1], A. Ghaseminejad-Raeini[2], A. H. Hoveidaei[3], A. Bahrami[4], S. Esmaeili[5], M. S. Khonji[2], B. O. Nwankwo[6], A. Azarboo[2]

[1]International Center for Limb Lengthening, Rubin Institute for Advanced Orthopedics, Sinai Hospital of Baltimore, Baltimore, USA, [2]School of Medicine, Tehran Univ. of Medical Sciences, Tehran, Iran, [3]Sports Medicine Research Center, Neuroscience Institute, Tehran Univ. of Medical Sciences, Tehran, Iran, [4]School of Medicine, Kashan Univ. of Medical Science, Kashan, Iran, [5]Sina Univ. Hospital, Tehran Univ. of Medical Sciences, Tehran, Iran, [6]Howard Univ. Hospital, Dept. of Orthopaedic Surgery and Rehabilitation, Washington, USA

Objective: Increased physical function and pain relief from osteoarthritis and arthritis are two benefits of total joint arthroplasty (TJA). There have been variations in the results of TJA in individuals with endocrinological conditions such as Cushing's illness and Diabetes Mellitus, according to earlier research. One of the main risk factors for osteoarthritis is acromegaly, a chronic hormonal disorder. Severe cases might be treated with TJA. Due to their higher rate of OA, comorbidities, and fracture risk, it is imperative to look into TJA results in individuals with acromegaly. There is a substantial knowledge gap, however, as there are notably few controlled trials assessing TJA outcomes in individuals with acromegaly.

Methods: We used data from the PearlDiver national database to analyze data for this retrospective matched-control research. Using a combination of Current Procedural Terminology (CPT) codes and International Classification of Diseases (ICD) codes from versions -9 and -10, the Patient Records Database covering the years 2010–2022 was utilized to identify acromegalic patients who underwent total hip arthroplasty (THA), total knee arthroplasty (TKA), and total shoulder arthroplasty (TSA). Individuals with a history of osteoporosis in the past and short follow-up periods were not included. Using matching based on confounding variables, nonacromegalic control groups were chosen.



Results: A total of 1440 patients—665 THA, 618 TKA and 157 TSA—were found to have acromegaly. Postoperative revision after THA (OR (1-y) = 0.76 [0.42–1.28], OR (5-y) = 0.68 [0.42–1.06]), TKA (OR (1-y) = 0.89 [0.48–1.55], OR (5-y) = 0.78 [0.49–1.17]), and TSA (OR (1-y) = 0.19 [0.02–1.40], OR (5-y) = 0.32[0.10–1.07]) did not significantly differ from the control group. Furthermore, one or five years following the procedure, individuals with acromegaly showed no significant rise in risk of mechanical problems.

Conclusion: In comparison to matched control groups, the data showed no significant association between acromegaly and the incidence of revisions or mechanical issues. When medically warranted in patients with acromegaly, orthopedic surgeons may contemplate undertaking similar procedures with comparable expectations, thanks to the valuable understanding that our data fill. In addition, additional research with a more narrow focus on functional results might be beneficial.

P118
GLOBAL AND REGIONAL EPIDEMIOLOGY OF BONE FRACTURES IN THE PAEDIATRIC AND ADOLESCENT POPULATION: A 30-YEAR COMPREHENSIVE ANALYSIS OF THE GLOBAL BURDEN OF DISEASES STUDY 2019

A. H. Hoveidaei[1], A. Ghaseminejad-Raeini[2], A. Azarboo[2], K. Pirahesh[2], S. Esmaeili[3], S. H. Hosseini-Asl[2]

[1]Sports Medicine Research Center, Neuroscience Institute, Tehran Univ. of Medical Sciences, [2]School of Medicine, Tehran Univ. of Medical Sciences, [3]Sina Univ. Hospital, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Fracture epidemiology in the pediatric population, although being a major health issue, has rarely been investigated in the existing evidence. This study aimed to Inspect the global and regional trends of pediatric fractures' incidence and burden from 1990 to 2019.

Methods: The primary data source for this analysis was the Global Burden of Disease study (GBD). The study reported key indices, including incidence and years lived with disability (YLD) of fractures in the pediatric population (0–19 y), for all GBD regions, presented both as rates and numbers. Time-trend analysis was performed using joinpoint regression reporting average annual percent change (AAPC).

Results: Global incidence and YLD of pediatric fractures were 48.30 million (95%UI = 40.64–57.69) and 1.45 million (95% UI = 0.97–2.06), respectively in 2019. A significant downward trend was

observed in both incidence (AAPC = − 0.61% [95% CI = − 1.07 to − 0.15%]) and YLD rate (AAPC = − 0.73% [95% CI − 1.01 to − 0.36%]) from 1990–2019. Those aged 15–19 y had the highest incidence and YLD in 2019. Male cases were predominant across all years. Fracture of radius and ulna was the most common type of pediatric fracture worldwide in 1990 and 2019. However, the highest YLD was observed in those with fractures of patella, tibia, fibula, or ankle. In 2019, pediatric fracture incidence was higher in Australasia and Central Europe. Unlike global incidence, an upward trend was seen in Western Europe, Australasia, and Southern Latin America. The most common injury causes were falls (41.86%) and exposure to mechanical force (15.18%) in 2019.

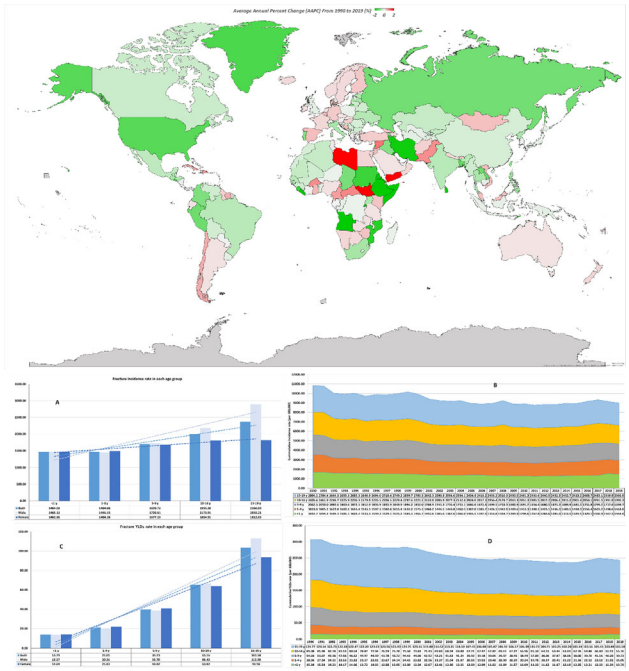


Figure 1. Average Annual Percent Change (AAPC) of bone fracture incidence in paediatrics (above) and age and sex distribution of YLD and incidence in these cases (below).

Conclusion: Global pediatric fracture incidence and YLD demonstrated a slight decline over time across genders and age groups. In regions like Western Europe, Australasia, and Southern Latin America, targeted interventions by health policymakers are crucial to mitigate underlying causes. Orthopedic surgeons should anticipate better management strategies, focusing on the most affected fracture sites in their respective regions.

P119
RETHINKING THE ROLE OF FORMAL PHYSICAL THERAPY IN GLENOHUMERAL OSTEOARTHRITIS: A NATIONWIDE STUDY IN THE USA

J. D. Conway[1], A. H. Hoveidaei[2], A. Ghaseminejad-Raeini[3], F. Moosaie[3], F. Kanaani Nejad[4], M. S. Khonji[3], M. N. Gilotra[5], B. O. Nwankwo[6], A. Azarboo[3]

[1]International Center for Limb Lengthening, Rubin Institute for Advanced Orthopedics, Sinai Hospital of Baltimore, Baltimore, USA, [2]Sports Medicine Research Center, Neuroscience Institute, Tehran Univ. of Medical Sciences, Tehran, Iran, [3]School of Medicine, Tehran Univ. of Medical Sciences, Tehran, Iran, [4]Anesthesiology and Critical Care Research Center, Shiraz Univ. of Medical Sciences, Shiraz, Iran, [5]Dept. of Orthopaedics, Univ. of Maryland School of Medicine, Baltimore, USA, [6]Howard Univ. Hospital, Dept. of Orthopaedic Surgery and Rehabilitation, Washington, USA

Objective: A prevalent degenerative joint condition affecting the middle-aged and elderly is glenohumeral osteoarthritis (OA), which has a major negative impact on the quality of life of patients. This condition can be managed using a variety of interdisciplinary, nonoperative, and operative techniques. Preoperative physical therapy has been suggested by the clinical practice guidelines based on the opinions of professionals, despite the lack of data to support its effectiveness. Finding out if adding physical therapy to a nonoperative method would effectively manage the course of OA and possibly save patients from needing total shoulder arthroplasty (TSA) surgery is the goal of this USA-wide study.
Methods: We made advantage of PearlDiver, a national database with over 100 million patients in it. Using ICD-9, ICD-10, and Current Procedural Terminology (CPT) codes, individuals diagnosed with glenohumeral OA between 2010–2022 made up this retrospective cohort. The rate of total surgical arthroplasty (TSA) at two and five years was compared between patients who underwent physical therapy (PT) within a year of being diagnosed with glenohumeral OA and patients who did not receive PT. Additionally, patients with and without corticosteroid injection within a year of diagnosis were also compared. To account for possible confounding variables, multivariable logistic regression was utilized.
Results: The study consisted of 5,200,419 patients with glenohumeral OA. Among patients with corticosteroid injection, patients who received PT had significantly higher 2- and 5-year TSA rate compared to those without PT (2-y TSA: 0.46 vs. 0.24%, OR [95% CI]: 2.06 [1.82, 2.35] and 5-y TSA: 0.80 vs. 0.44%, OR [95% CI]: 2.05 [1.86, 2.25]). Similar association was also significant among patients without corticosteroid injection (0.24 vs. 0.11%, OR [95% CI]: 2.42 [2.31, 2.54] and 0.50 vs. 0.24%, OR [95% CI]: 2.37 [2.29, 2.45], respectively).
Conclusion: The findings of this study indicate that individuals who did physical therapy as a part of their nonoperative treatment had a 2 to 2.4-fold increased probability of requiring TSA. In light of the potential association between the expedited deterioration of the glenohumeral joint and the increased rate of TSA, from now on, orthopedic surgeons and physical therapists need to proceed with caution when recommending preoperative physical therapy as a technique for managing glenohumeral OA.

P120
EFFICACY AND SAFETY OF ASFOTASE ALFA IN PATIENTS WITH HYPOPHOSPHATASIA: A SYSTEMATIC REVIEW

A. Ghaseminejad-Raeini[1], S. Esmaeili[2], A. Shirinezhad[1], A. Azarboo[1], A. H. Hoveidaei[3]

[1]School of Medicine, Tehran Univ. of Medical Sciences, [2]Sina Univ. Hospital, Tehran Univ. of Medical Sciences, [3]Sports Medicine Research Center, Neuroscience Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Hypophosphatasia (HPP) is a rare hereditary metabolic disorder characterized by inadequate activity of tissue nonspecific alkaline phosphatase (TNSALP). Asfotase alfa, a recent development, aims to address complications associated with HPP. This study systematically reviews existing evidence regarding the safety and efficacy of asfotase alfa in treating HPP.
Methods: We conducted a systematic search following the PRISMA guidelines across databases, including PubMed, Scopus, Web of Science, and the Cochrane Library. Inclusion criteria comprised studies assessing the impact of asfotase alfa on diverse complications in HHP patients, comparing them to untreated control groups or baseline

conditions. Acceptable study designs encompassed observational (cohort, case–control, cross-sectional), clinical trials, and case series (with a minimum of 5 patients). Two independent reviewers conducted screening, data extraction, and quality assessment.

Results: Fourteen studies, encompassing 271 treated HPP patients (58% female), were included. The studies comprised 8 multicenter clinical trials, 2 single-center clinical trials, 3 case series, and 1 cohort. Among these, 4 studies investigated patients aged 18 years and older, while 5 studies focused on those under 5 years old. Treatment durations in the studies varied from 13 weeks to 7 years. Asfotase alfa treatment has demonstrated notable improvements across various aspects. Eight studies highlighted improvements in mineralization and BMD, with five studies underscoring enhancements in respiratory status. Moreover, pain reduction was reported in five studies, with one study noting a non-significant decrease. Growth enhancement was documented in three studies, and enhanced walkability was emphasized in four studies, while improved muscle strength was reported in five studies. Additionally, two studies delved into the treatment's impact on the quality of life. Notably, three studies observed the normalization of plasma pyridoxal phosphate (PPI) and pyridoxal 5'-phosphate (PLP) levels due to treatment. The most frequently reported adverse events comprised injection site reactions in seven studies and pyrexia in two studies.

Conclusion: Asfotase alfa treatment has demonstrated noteworthy significance, especially in improving mineralization, walking ability, and respiratory status among HPP patients. Although the majority of patients experienced some adverse events, most of these incidents were not complicated. The results show heterogeneity, hindering a precise conclusion. To enhance our understanding of the efficacy and safety of asfotase alfa, further longitudinal research with a larger sample size is essential.

P121
HORMONES OF ADIPOSE TISSUE ON WEIGHT LOSS IN PATIENTS WITH RHEUMATOID ARTHRITIS

A. Bacumova[1], L. Aref'Eva[1], L. Sivordova[2]

[1]Volgograd State Medical Univ., [2]Federal State Budgetary Institution, Zborovsky Research Institute of Clinical and Experimental Rheumatology, Volgograd, Russia

Objective: Overweight in patients with rheumatic diseases is a condition that prolongs chronic inflammation and promotes synthesis and secretion of pro-inflammatory factors [1,2,3]. We investigated the relationship the effect of weight loss over 5 kg on the clinical manifestations of arthritis and hormones of adipose tissue serum levels in patients with rheumatoid arthritis (RA).

Methods: We observed 80 female patients with RA (EULAR/ARA 2010 criteria) ranged in age from 39–69 y (mean age 51.72 $\pm$ 5.83 y) and the control group (60 healthy persons). Fetuin A, nesfatin, hemerin, leptin, adiponektin, resistin, visfatin level was determined by commercial test systems.

Results: As overweight patients were recruited in the study, hypocaloric diet low in animal fats and physiotherapy has been recommended to all participants. The positive dynamics in body weight loss over 5 kg within 3 months has been achieved by 34 patients (27.2%). In RA patients with weight loss, a significant decrease in the serum level of pro-inflammatory cytokines ($p < 0.01$) and an increase in the quality of life according to the EQ-5D-5L ($p < 0.001$) index were observed. This fact is probably explained by the decreased activity of inflammatory process after RA therapy and weight reduction.

Conclusion: Thus, these findings suggest that there is a possible role of tissue pro-inflammatory cytokines in the pathogenesis of rheumatoid arthritis.

References:

1. Akhverdyan Y, et al. Annal Rheum Dis 2017;76:1149
2. Papichev EV, et al. Osteoporos Int 2019;30:S.381
3. Polyakova J, et al. Annal Rheum Dis 2019:30:S.387

P122
RIGHT CARE, FIRST TIME: OSTEOARTHRITIS, MENTAL HEALTH, AND SLEEP DISTURBANCES

C. Walker[1], A. Bajaj[2]

[1]Viatris, Hatfield, UK, [2]Viatris, Bengaluru, India

Multiple studies demonstrate that 20–25% of osteoarthritis (OA) patients experience affective disorders including depression or anxiety however the impact of comorbid depression on the treatment of OA has not been as well evaluated. OA also commonly associates with significant sleep disturbances, particularly in the elderly and negative bidirectional effects of pain on depression and sleep disturbances are potentially overlooked.

Chronic pain and mental health: OA is associated with persistent and chronic pain as a primary symptom of the disease. Multiple studies have shown that chronic pain depicts a fundamental risk factor for the development of depression and disturbances in sleep. Being female, higher baseline WOMAC pain and dysfunction score and having two or more painful sites, increase the risk of depression. Ageing is a risk factor for OA, but not a risk factor for depression, with ageing also reportedly being linked to an increased likelihood of poorer sleep (both quantity and quality). Systematic reviews have revealed that OA patients diagnosed with anxiety and/or depression experienced more pain, had frequent hospital visits, took more medication, and reported less optimal outcomes. Also, depression and anxiety were found to be predictors of complications after primary total joint arthroplasty and have been associated with higher healthcare costs, extended length of hospital stay, or increased postoperative mortality after TKA/THA (Total Knee/Hip Arthroplasty).

What can we do? Depression may serve as a better predictor of disability than radiographic degenerative joint changes and indicate amplified pain and functional disability. Routine psychological screening could be beneficial for OA patients. Early diagnosis, counselling on mood and sleep hygiene, psychological support, exercise, antidepressant pharmacotherapy and/or problem-solving treatment and interdisciplinary collaboration should be a part of the core management strategy in OA patients.

Conclusion: Depression and sleep disturbances increase the health-related burden of OA. Greater attention to these comorbidities and overall health among patients with OA is warranted. Detecting and managing mental health issues, and chronic sleep disturbances could pave the way for better management of OA.

P123
ARTIFICIAL INTELLIGENCE IN MUSCULOSKELETAL HEALTH: THE WHAT, HOW AND WHY?

A. Bajaj[1], C. Walker[2], R. Chiaese[3], S. Er[4]

[1]Viatris, Bengaluru, India, [2]Viatris, Hatfield, UK, [3]Viatris, Monza, Italy, [4]Viatris, Istanbul, Turkey

Use of artificial intelligence (AI), and machine learning (ML) has increased in numerous critical medical sectors, significantly impacting patients' and practitioners' lives. AI-aided systems are increasingly available for diagnosis, management and physiotherapy

rehabilitation in musculoskeletal conditions providing benefits to the patient and efficiencies for healthcare systems.

Applications of AI in Musculoskeletal Health: AI helps monitor and track pain triggers and assists patients and healthcare professionals in the identification of the most effective coping mechanisms. Mobile apps rather than manual approaches have been found to be more useful by patients to track joint pain, stiffness and buckling of knees potentially assisting in early diagnosis. New AI-enabled tools can also monitor patient's mental health and warning signs by capturing brief voice samples and analyzing them for signs of depression or anxiety. Therapists accessing data from AI apps can easily and remotely monitor patients' conditions. AI can also be helpful in orthopaedic surgeries to help decide whether to perform surgery, preoperatively estimate the risk of complications or mortality, the functioning of the prosthesis, as well as predict the duration of hospital stay, with accuracy and reliability.

Limitations of AI: To maximize the usefulness of AI the quality of data must be safeguarded, and the quantity of data maximized to avoid drawing erroneous conclusions. Additionally, AI can't reliably provide a causality assessment for chronic painful conditions.

Conclusion: AI systems that are practical, solution-driven, cost-effective, and easily accessible are the goal for large patient populations. Cutting-edge AI-imaging and ML technologies are potentially beneficial in lowering pain and enhancing functional impairment in patients with musculoskeletal diseases. The use of some technologies may be challenging in older age groups but is not insurmountable when help is provided.

P124
CORRELATION BETWEEN DXA AND HR-PQCT IN OSTEOGENESIS IMPERFECTA: PRELIMINARY FINDINGS IN A COHORT OF ADULT PATIENTS

S. Gazzotti[1], R. Sassi[1], E. Schileo[2], G. Fraterrigo[2], A. Moroni[3], M. Miceli[1], M. P. Aparisi Goméz[4], F. Taddei[2], L. Sangiorgi[3], A. Bazzocchi[1]

[1]Diagnostic and Interventional Radiology, IRCCS Istituto Ortopedico Rizzoli, Bologna, Italy, [2]Bioengineering and Computing Laboratory, IRCCS Istituto Ortopedico Rizzoli, Bologna, Italy, [3]Dept. of Medical Genetics and Rare Orthopaedic Diseases, and CLIBI Laboratory, IRCCS Istituto Ortopedico Rizzoli, Bologna, Italy, [4]Dept. of Radiology, Auckland City Hospital, New Zealand

Objective: To evaluate the correlation between areal BMD (aBMD) measured by DXA and HR-pQCT parameters in adults with osteogenesis imperfecta (OI).

Methods: The present report includes preliminary data from 14 adult patients (mean age: 36 y) with OI enrolled in an ongoing prospective study. aBMD was measured with DXA (Hologic QDR Discovery Wi) at the lumbar spine, hip, forearm (1/3 and ultradistal radius), and total body. HR-pQCT (XtremeCT II, SCANCO Medical), a noninvasive modality that couples high resolution and low dose in vivo to gain insight into bone microarchitecture, was performed at the distal radius and tibia using a fixed offset protocol and automatic contouring with standard XtremeCT II evaluation. A p-value < 0.05 was considered significant.

Results: DXA classified 4 out of 14 patients included in our cohort as having normal BMD. However, HR-pQCT revealed widespread deteriorations in most parameters of density and microstructure, enabling the identification of different bone phenotypes, despite the relative clinical homogeneity of the sample population. Total volumetric BMD measured by HR-pQCT at the distal radius correlated well with DXA-aBMD at the ultradistal radius ($r = 0.75$; $p = 0.002$) and this relationship predominantly reflected agreement in the cortical rather than trabecular compartment. There were limited associations between DXA-aBMD at central sites (lumbar spine and hip) and HR-pQCT parameters at both the distal tibia and radius. Nevertheless, some significant correlations were found between DXA-aBMD at the hip (femoral neck and/or total femur) and several trabecular HR-pQCT parameters at the distal tibia.

Conclusion: In adults with OI, there is initial evidence of site-specific agreement between DXA and HR-pQCT in the measurement of BMD values. Moreover, HR-pQCT may be able to provide information on bone quality that complements DXA evaluation at central sites. Additional patients will be included in this ongoing study, to validate our preliminary results and clarify the potential role of HR-pQCT in the characterisation of bone fragility in OI.

P125
SHORT-CHAIN FATTY ACIDS (SCFAS) ENHANCES BONE HEALTH IN POSTMENOPAUSAL OSTEOPOROSIS

A. Bhardwaj[1], L. Sapra[1], R. K. Srivastava[1]

[1]All India Institute of Medical Sciences (AIIMS), New Delhi, India

Objective: Short-chain fatty acids (SCFA), the primary metabolites produced by intestinal microbiota, have an impact on both innate and adaptive immunity. It has been demonstrated that high fiber diet, the primary fermentable source of SCFA, reduces the degeneration of bone in rheumatoid arthritis. Based on these facts we were interested in investigating the effect of SCFAs (acetate, propionate and butyrate) in regulating bone health in postmenopausal osteoporosis (PMO). We aimed to investigate the role of SCFAs on bone health under estrogen-deficient conditions.

Methods: In vitro assays for osteoclastogenesis and osteoblastogenesis in the presence and absence of different concentrations of SCFAs were performed. Coculture assays of SCFAs primed Treg along with osteoclast/osteoblast were done to assess the immunoporotic potential of SCFAs. To further evaluate the mechanism of probiotics-induced prevention of bone loss in vivo, female C57BL/6 mice were randomly divided into the following groups viz. Sham, ovx (ovariectomized), ovx + probiotics (*L. rhamnosus*, and *B. longum*-10^9 CFU/d). At day 45 mice were sacrificed and bones (SEM, μCT); small intestine, large intestine, bone marrow, and mesenteric lymph nodes (flow cytometry); serum and fecal content (ELISA and HPLC) were harvested to assess the immunomodulatory role of SCFAs on ovx-bone loss.

Results: Ovariectomized condition led to enhanced bone loss in female mice as confirmed by SEM and μCT data. HPLC data showed that ovx mice had significantly lower fecal SCFA levels than the sham group, thereby confirming the potential role of SCFAs in regulating bone health. Next, we investigated the mechanism underlying SCFAs-modulation of bone remodeling via various in vitro assays. We observed that SCFAs significantly inhibit osteoclastogenesis along with promoting osteoblastogenesis in a dose-dependent manner. Furthermore, SCFAs were found to enhance the differentiation of Tregs significantly. Interestingly co-cultures of SCFAs primed Tregs with BM-osteoclast precursors inhibited osteoclastogenesis along with simultaneously enhancing osteoblastogenesis. Lastly, we confirmed that probiotics such as *L. rhamnosus* and *B. longum* prevent bone loss by restoring the level of SCFAs in ovx mice.

Conclusion: Altogether, our results for the first time propose SCFAs as potent regulators of bone health under ovx conditions thereby offering a mechanistic link between the "gut-immune-bone" axis. Our results have immense clinical implications in proposing the therapeutic potential of SCFAs in managing bone loss under osteoporotic conditions in the clinics.

P126
RISK GROUPS FOR LOW VITAMIN D: CHANGING THE PARADIGM IN CLINICAL PRACTICE

A. Bleizgys[1]

[1]Vilnius Univ., Faculty of Medicine, Vilnius, Lithuania

It is well established that musculoskeletal diseases, e.g., osteoporosis or rickets, can be caused by vitamin D insufficiency or deficiency. Therefore, those illnesses are considered risk factors for low vitamin D, i.e., such patients should be tested for their serum 25-hydroxyvitamin D levels that are the best marker of vitamin D status in clinical practice. However, there are many diseases and conditions that can themselves impair vitamin D metabolism, or dramatically increase requirements for this vitamin that cannot be met via natural sources (synthesis in the skin and from food). In addition, there's some evidence that low vitamin D levels might contribute to the development of certain extraskeletal diseases. Clinicians should be familiar with the variety of risk factors that can help suspect low vitamin D in certain patients and, via vitamin D supplementation, replete their vitamin D stores, expecting improvement of at least the condition of musculoskeletal system.

P127
STRESS FACTORS IN SYSTEMIC LUPUS ERYTHEMATOSUS (SLE) AND ANTIPHOSPHOLIPID SYNDROME (APS) PATIENTS COMPARISON

A. Borisova[1], T. Lisitsyna[1], D. Veltischev[2], T. Reshetnyak[1], O. Seravina[2], O. Kovalevskaya[2]

[1]V.A. Nasonova Research Institute of Rheumatology, [2]Serbsky NMRC PN MoH, Moscow, Russia

Objective: Stress factors in childhood and in a period before the manifestation of SLE and APS symptoms predispose and precipitate the development of rheumatic diseases. We aimed to describe predisposing and precipitating stress factors in SLE and APS patients.
Methods: 181 patients: 69 with SLE (60 women and 9 men), 55 with SLE and secondary APS (40 women and 15 men) and 57 with PAPS (37 women and 20 men), the median age of which was 31.0 [22.0; 41.0], 40.0 [32.0; 48.0] and 41.0 [35.0; 46.0] years, respectively, were consecutively enrolled in the study. Stress factors were detected by psychiatrist in semistructured interview in accordance with ICD10.
Results: Early childhood stressors were detected significantly more often in patients with SLE compared to PAPS and SLE + APS: 53 (76.8%) vs. 31 (54.4%), p = 0.006 and vs. 33 (60.0%), p = 0.03, respectively. Childhood stressors are also more typical for patients with SLE than PAPS: 55 (79.7%) vs. 36 (63.2%), p = 0.03. In particular, SLE patients were exposed to parental deprivation significantly more often than patients with SLE + APS (54 (78.3%) vs. 34 (61.8%), p = 0.04) and PAPS (54 (78.3%) vs. 32 (56.1%), p = 0.007); and also—a threat to safety in childhood was more common in SLE compared with PAPS (10 (14.5%) vs. 1 (1.75%), p = 0.01) and in adolescence compared with SLE + APS (11 (15.9%) vs. 2 (3.64)%), p = 0.02) and with PAPS (11 (15.9%) vs. 3 (5.26%), p = 0.05). Among childhood traumas, chronic stress factors predominated in patients with SLE: 60 (86.9%) vs. 34 (59.6%), p = 0.0005 in patients with SLE compared with PAPS and 40 (72.7%) vs. 34 (59.6%), p = 0.04 in patients with SLE + APS compared with PAPS. Stressful events at the onset of SLE were detected in 69.6%. At the same time, in patients with SLE + APS, chronic (18 (51.4%) vs. 12 (25.0%), p = 0.01) family stress predominated (17 (48.6%) vs. 10 (20.8%), p = 0.008), and in patients with SLE—acute stress (34 (70.8%) vs. 15 (42.9%), p = 0.009), including losses (7 (14.6%) vs. 0, p = 0.02). Multiple significant stressful events (cumulative stress load) before rheumatic disease were noted significantly more often in patients with SLE compared to patients with PAPS (32 (46.4%) vs. 13 (22.8%), p = 0.005) and SLE + APS (32 (46.4%) vs. 14 (25.5%), p = 0.01). Stressful events at the onset of APS were observed in 56.4% of patients. In patients with PAPS, acute stress situations prevailed compared with SLE + APS (23 (74.2%) vs. 14 (48.4%), p = 0.03), and in patients with SLE + APS, compared with PAPS, chronic (16 (51.6%) vs. 7 (22.6%), p = 0.02).
Conclusion: Compared with APS, SLE patients were more often exposed to stressors in childhood. At the same time, stressful events in childhood in patients with SLE were more often chronic. More than 2/3 of SLE patients and slightly more than half of APS patients experienced stressful event within a year before the onset of the disease. Multiple stressful events were observed in SLE patients much more often than in APS patients during life before the disease. The stress related predisposition and chronic stress precipitation could be a common pathogenesis factors for the development as the rheumatic disease, as the anxiety-depressive spectrum disorder, diagnosed in most SLE and APS patients.

P128
PATIENT AND PUBLIC INVOLVEMENT (PPI) IN MUSCULOSKELETAL RESEARCH: A PRAGMATIC REVIEW WITH RESOURCES FOR OPTIMIZING INTEGRATION OF PATIENT EXPERIENCE DATA (PED)

A. Botto-Van Bemden[1], A. Arumugam[2]

[1]Patient and Public Involvement, Musculoskeletal Research International, Inc., Miami, USA, [2]Univ. of Sharjah, Dept. of Physiotherapy, Sharjah, United Arab Emirates

Objective: Patient and public involvement (PPI) is essential for Patient-Centered care and Patient-Focused Medicines Development. Proper PPI ensures optimal integration of Patient Experience Data (PED), helping to ensure patients' expectations, needs and preferences are met. It is essential to ensure competence of the research team by capacity building with available tools and resources on PPI. This brief review aims to prompt PPI access and action by briefly summarizing the most relevant PPI resources.
Methods: This pragmatic review summarizes the most relevant best practices, checklists, guidelines and tools for optimizing PPI in musculoskeletal research. Practical resources for PPI in various stages of research projects are reviewed- conception, co-creation, design (including qualitative or mixed methods), execution, implementation, feedback, authorship, acknowledgement and remuneration of patient research partners, and dissemination and communication of research findings.
Results: A resource table with links to various tools and referenced material for PPI in various stages of research was created.
Conclusion: Gaps in research and challenges in care management create PPI opportunities for researchers and patient research partners (PRPs) to co-create meaningful studies and/or research development programs by setting research priorities together, developing protocol designs and research partnerships that are fit for purpose, improving recruitment and research awareness, team competence and capacity building, dissemination and sharing of results, actionable insights for improved access and regulatory approval, etc. Successfully optimizing integration of PPI research opportunities will require a shift in mindset for most and capacity building for all stakeholders.
Acknowledgement: We thank each patient partner for their contributions creating PPI tools and resources and all PPI stakeholders who encouraged and continue to encourage patient partnership.

P129
THERAPEUTIC REHABILITATION STRATEGIES IN RHEUMATOLOGICAL SYNDROMES IN THE NEOPLASTIC PATIENT

A. Bumbea[1], R. Traistaru[1], V. Caimac[1], O. Rogoveanu[1], A. Musetescu[1]

[1]Univ. of Pharmacy and Medicine of Craiova, Craiova, Romania

Objective: To establish a strategy to approach the neoplastic patient with rheumatoid syndrome.
Methods: Some nonspecific rheumatoid syndromes (1) can be secondary to a neoplastic pathology. Malignancy can determine multiple paraneoplastic phenomena, the substrate being chronic inflammation and the procoagulant status, the latter can also produce a stroke (2). We included a number of 20 patients (2013–2023) who presented with clinical aspects of rheumatoid arthritis or lupus-like syndromes secondary to a diagnosed neoplasia. The evaluation of these patients highlighted specific rheumatoid clinical aspects, moderate inflammatory biological syndrome. The rehabilitation consisted in the application of TENS on selected areas, as therapy allowed for the neoplastic patient. They were evaluated initially and at 3 months using the VAS scale and the ADL scale. All patients received combined anti-algesic therapy such as paracetamol, NSAIDs and recovery therapy.
Results: Patients with combined therapy showed a 31.4% reduction in rheumatoid syndrome with improved functionality. Biological tests were slightly influenced, but functionality improved by an average of 39.3%. The evaluation at 3 months maintained the same results.
Conclusion: The combined therapy of analgesics, low doses of nonsteroid and TENS therapy brings improvements in the quality of life of neoplastic patients with rheumatoid syndrome.
References:

1. De Cock D, Hyrich K. Best Pract Res Clin Rheumatol 2018;32:869
2. Bumbea AM, et al., Rom J Morphol Embryol 2017;58:1477

P130
THE COMPLEX THERAPEUTIC APPROACH OF THE PAINFUL SHOULDER IN THE STROKE PATIENT USING REHABILITATION TECHNIQUES AND BOTULINUM TOXIN

A. Bumbea[1], R. Traistaru[1], V. Caimac[1], A. Turcu Stiolica[1]

[1]Univ. of Pharmacy and Medicine of Craiova, Craiova, Romania

Objective: To develop a complex therapeutic plan that includes the injection of botulinum toxin into the spastic muscles and a rehabilitation program for the painful shoulder in the patient with stroke and spasticity.
Methods: It is known from the literature that patients with spasticity benefit from botulinum toxin therapy, which allows the application of rehabilitation programs with superior results (1). Thirty patients with stroke and spasticity of the upper limb who presented pain and limited mobility at the shoulder level were studied. The patients were evaluated using the VAS scale, the Ashworth spasticity scale, and functional assessment of the shoulder. All patients received specific rehabilitation treatment, ultrasound applications, massage and physical therapy. The group was divided into two groups, Group A, which included 15 patients who received botulinum toxin treatment for spastic shoulder muscles. Group B received only rehabilitation treatment.
Results: It was found that group A that received botulinum toxin had a favorable functional evolution and a reduction in pain quantified on the VAS scale with a reduction of approximately 43.6%, compared to group B where the improvement was only 19.45%.
Conclusion: Spasticity therapy with botulinum toxin applied to patients with spasticity combined with upper limb rehabilitation program and shoulder pain had a much improved evolution.
Reference: (1) Bumbea AM, et al. Life Basel 2023;13:2218

P131
COMPREHENSIVE APPROACH TO THE MANAGEMENT AND TREATMENT OF ADULTS WITH X-LINKED HYPOPHOSPHATEMIA (XLH)

A. C. Polonsky[1]

[1]Hospital Centenario, Rosario, Argentina

Objective: X-linked hypophosphataemia (XLH) is an X-linked dominant disorder caused by mutations in PHEX[1]. XLH is the most common genetic form of hypophosphatemic rickets and osteomalacia. Its incidence has been estimated at 3.9–5 cases per 100.000 live births[2]. The mutations or chromosomal derangements affecting the phosphate regulating endopeptidase homolog, X-linked (PHEX) gene on the X chromosome lead to elevated levels of the hormone FGF23, resulting in renal phosphate wasting, impaired 1a-hydroxylation of 25-hydroxyvitamin D and consequently, chronic hypophosphatemia, impaired skeletal mineralization and rickets[2]. Patients usually develop clinical symptoms during the first or second year of life[1]. The clinical features include those common for hypophosphatemic rickets, short stature, waddling gait, and leg bowing in growing children, in addition to muscle weakness. Fatigue and chronic pain become more prevalent in older children and particularly adults[2]. Even adults with milder forms usually develop symptoms in their third or fourth decade, which may include bone and joint pain, fatigue, enthesopathy (commonly involving the hips and anterior spinal ligament), pseudofractures, dental complications and early osteoarthritis. These complications ultimately cause chronic pain, impaired mobility, loss of productivity and lower quality of life. Other complications include hearing loss, overweight and obesity has also been observed in XLH. The diagnosis of XLH relies on the combination of clinical, radiographic, biochemical and genetic features. Conventional management of XLH involves phosphate supplementation and active vitamin D (calcitriol). While conventional therapy can help manage bone pain, children with XLH can still develop significant lower limb deformity and often have short stature[3]. Burosumab is a neutralizing antibody to FGF23 and is superior to conventional management of the condition in both adults and children[3]. We aimed to evaluate the clinical and biochemical characteristics of a cohort of adult patients with XLH and evaluate the best therapeutic option.
Methods: A total of 11 adult patients were recruited, of which 8 had a diagnosis of XLH confirmed in childhood. The other two were diagnosed because they had a family member with the disease and a molecular study was performed to confirm the presence of XLH. Clinical follow-up, disease sequelae, laboratory, and therapeutic alternatives were carried out for one year. Only 8 of the 11 patients were evaluated until the end of the study.
Results: All the patients studied have a common characteristic of deformities in their limbs to a greater or lesser extent, decreased hearing, mostly mild, and dental disorders. Everyone complains of pain, both at rest and during movement. Only two patient underwent treatment without interruptions since childhood, but the majority stopped during adolescence. One of the patients, despite having had orthopedic surgeries in childhood and dental disorders, was diagnosed at the age of 64 years, also presenting postmenopausal osteoporosis, which is why we believe it is urgent to start therapy with burosumab. As seen in the Table, not all participants carried out the controls as established. From the results obtained, an increase in the

phosphataemia value is evident in those patients who started with phosphorus salts but not in RTP. An increase in PTH is also evident as a consequence of conventional treatment.

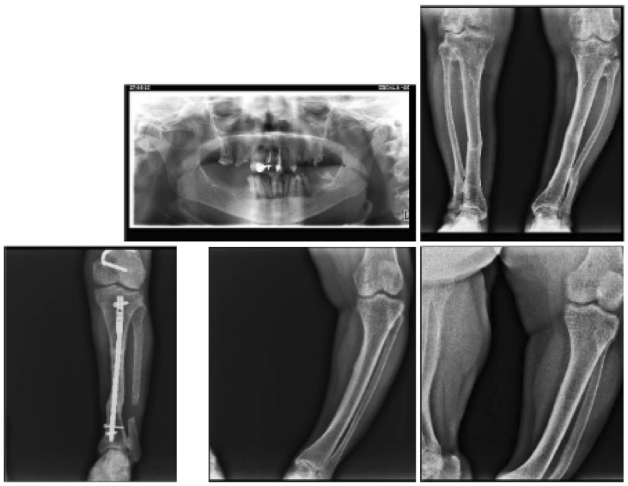
	SC		SN		LS		BS	DS	JR		LM		VA		EG	
Months	0	12	0	12	0	12	0	0	0	12	0	12	0	12	0	12
Age	34		22		35		29	33	23		30		33		65	
Gender	F		F		F		M	M	M		M		F		F	
Age at diagnosis	2		5		8		6	5	3		4		32		65	
Weight (Kg)	62		38		58				89		60		49		50	

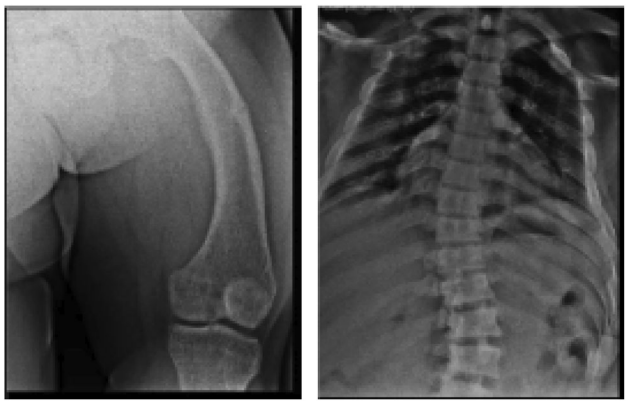
Height (mt)	1,4		1,34		1,35				1,38		1,47		1,49		1,43	
IMC	32		21		30				47		28		22			
FGF23	<LOD		268,7 (VN <134)		<LOD				<LOD							
Molecular study																
Kidney ultrasound	Normal		BH		Normal				Normal		cystalis					
DMO	Normal		Normal		Normal				Normal		Normal		Normal		OP	
Echocardiogram	Normal		Normal		Normal				Normal							
Audiometry	P				P				P							
Orthopantomography	P				P				P							
X Ray	P		P		P		P	P	P		P		N		P	
Genu varus measurement					21 cm											
Conventional treatmente duration	16 years		18 years		2-3 años		no	no	12 years		20 years		no		no	

Phosphorous (mg/dl)	1,8	2	1,8	2,4	1,5	2,5	1,3	1,6	1,8	2,5	1,33		1,9		1,6	
PTH (pg/ml)	127	98	328,8	145	46,8	113	27,03	41	32,5	69	43,05		96		85	
25 OH (ng/dl)	22,3		20,6		24,1		21,3	31,2	21,5		38,4		22,7		42	
1,25 (OH)2 D3			15,6		31,3		29,7				42,3		57,9			
FAL (mg/dl)	↑		↑		↑		↑	↑	↑		↑		↑		↑	
Phosphaturia (mg/24 hs)	35,2	145	121	114	776,7		639,9		53,4	68,9	1090		38,5		27,3	
Urinary Calcium (mg/24 hs)	221		2,8		94,5		124				410		130		68,6	
Urinary creatinine	46,9	106	57	84	1147,6		1225,6		165,4	77,5	1500		53,1		32	
Creatinine (mg/dl)	0,4	0,3				0,5										
RTP	81 %%	78%	35%		81%		79%		81%	78%	60%		77%		62%	
FGF23	<LOD		268,7 (VN <134)						<LOD				<LOD			
TmP/G	1,5		1		1,4				2		0,8		1,5		1	

FR																
Ortopedics surgery	SI		yes		no		NO	NO	yes		yes				yes	
Dental treatments	NO		yes		yes		NO	NO								
Others	NO				yes		NO	NO								
Conventional treatment	No	yes	yes	no	yes	yes	NO	NO	no	yes	yes	yes	No	yes	No	Yes
Specific Treatment	No	Indicated	no	Yes	no	Indicated	NO	NO	no	Indicated	no	Indicated	no	No	No	Indicated
INDICE WOMAC	Complete	Better	Complete	Better	Complete	equal	No	No	Complete	Equal	Complete	Equal	Complete	Better	Complete	Equal

F: Female M: Male, BH: Bilateral hyperecogenicity <LOD Under detection limit





Conclusion: Treatment for adults with XLH typically focuses on symptom management, including bone deformities and osteoarthritis. A multidisciplinary approach involving orthopedics, physiotherapy, and pain management is crucial for improving quality of life. Regular monitoring and adjustment of phosphate and vitamin D therapy are essential to maintain optimal levels and prevent complications. Burosumab, a monoclonal antibody approved for XLH treatment, has generally positive feedback. The problem with burosumab in my country is that it is so expensive, which can pose challenges for patients in terms of accessibility and affordability. The medical team must evaluate the cost–benefit relationship. It's understandable that some adult XLH patients may experience fatigue or reluctance regarding ongoing medical care from childhood. The weariness from

years of treatments and appointments can impact motivation to adhere to medical recommendations. In these cases, addressing patients' concerns and emotions is crucial. To improve treatment adherence in adult patients with XLH, it is crucial to implement strategies that facilitate the integration of the therapeutic regimen into their daily lives. Some suggestions include: continuous education, psychological support, simplification of the regimen, reminders and follow-up, family involvement, regular monitoring, treatment personalization. These combined measures can contribute to better treatment adherence in adult patients with XLH. It is essential to work collaboratively with the medical team and consider the preferences.

References

1. Haffner D, et al. Nat Rev Nephrol 2019:15:435
2. Laurent M, et al. Front Endocrinol 2021:12:641543
3. Schindeler A, et al. Front Endocrinol 2020;11:338

P132
COMPARATIVE PERFORMANCE OF CNN MODELS IN DETECTING FRACTURES IN X-RAY IMAGES

A. Chatsirisupachai[1], P. Nonthasaen[1], P. Achararit[1]

[1]Princess Srisavangavadhana College of Medicine, Chulabhorn Royal Academy, Bangkok, Thailand

Objective: This research confronts the public health challenge posed by osteoporotic fractures by comparing the effectiveness of convolutional neural networks (CNNs) in image classification vs. object detection tasks. We aimed to elucidate which method is more effective for fracture detection, which is critical in assessing fracture risk in osteoporosis.

Methods: We employed a FracAtlas dataset [1] with 717 abnormal scans out of 4,083 x-ray images. To achieve a balanced representation of fracture cases, 200 images with fractures and 200 without were designated for testing and validation, respectively. Classification models included MobileNetV3, Xception, and EfficientNetV2M, while object detection was performed with three variants of YOLOv8. For object detection, our evaluation criteria mirrored that of image classification—identifying at least one fracture correctly in an image was counted as a true positive, which aligns with clinical relevance where the detection of any fracture is the priority.

Results: Xception surpassed YOLOv8s in precision and F1-score, achieving 0.60 and 0.69, respectively, compared to YOLOv8s's 0.49 and 0.65. However, YOLOv8m achieved a superior recall rate, suggesting a decision between these models hinges on specific requirements. Although classification methods don't pinpoint fracture locations directly, using visualization tools like Grad-CAM enhances fracture detection in classification tasks, providing an efficient alternative to the traditionally more labor-intensive object detection methods.

Conclusion: In a domain traditionally favoring object detection, our study uncovers the promising capabilities of image classification for fracture identification. It offers a streamlined, efficient approach to osteoporotic risk assessment, advocating for a paradigm shift in fracture detection methods. Image classification, enhanced with visualization techniques, stands out as a viable, resource-efficient option.

Reference: (1) Abedeen I, et al. Scientific Data 2023;10:521

Acknowledgement: This work was supported by Chulabhorn Royal Academy.

P133
CLINICAL AND LABORATORY PREDICTORS OF THE DEVELOPMENT OF CHRONIC PAIN AND EARLY STAGES OF PTSD OSTEOARTHRITIS AFTER KNEE INJURY

A. Chernikova[1], A. Karateev[1], M. Makarov[1], E. Bialyk[1], V. Bialik[1], V. Nesterenko[1]

[1]Nasonova Research Institute, Moscow, Russia

Objective: Chronic pain and post–traumatic arthritis are frequent complications of injuries that cause suffering, loss of function and disability. To date, no clear predictors of the development of these complications have been identified. We aimed to determine the clinical and immunological factors associated with the development of chronic pain and early stages of post-traumatic osteoarthritis after knee joint injury.

Methods: From August 2022 to January 2023, 100 people were examined at the V.A. Nasonova Research Institute, including 56 women and 44 men at an average age of 26.95 ± 11.64 y, with an average BMI of 26.95 ± 4.99, who suffered a knee joint injury with persistent pain for a month or more. All patients agreed to the study, which is confirmed by informed voluntary consent. The patients underwent a clinical examination, laboratory research methods (UAC, highly sensitive CRP) were performed. A questionnaire was conducted on the scales of HRSH, KOOS, HAQ, CSI, BPI, Pain DETECT, FACIT-F, FIRST, HADS, and an MRI examination was performed on a Philips, MULTIVA 1.5 T device.

Results: According to the results of the study, it was revealed that the pain when moving along the CRH was on average 5.21 ± 1.30, the pain at rest on the CRH was on average 1.72 ± 1.74, the night pain on the CRH was on average 1.55 ± 1.84. Functional impairment according to HRH was 4.44 ± 1.79. Assessment of knee joint function: KOOS total was 52.02 (13;87), KOOS symptoms 62.26 (4;56), KOOS pain 60.58 (25;92), KOOS activity 68.97 (22;100), KOOS sport 28.92 (0;95), KOOS quality of life 41.02 (0;100). The value on the Pain DETECT scale, which evaluates the presence of signs of neuropathic pain, averaged 6.26 ± 4.79. According to the FIRST questionnaire, the indicators are from 0–5 (on average from 0.93 ± 1.26), which indicates the presence of concomitant fibromyalgia in some patients. According to the CSI questionnaires, the average values were 23.55 ± 13.38. According to the catastrophization scale, 13.54 ± 11.20. According to the HADS scales assessing the level of depression and anxiety, the values were 4.37 ± 4.01-depression and HADS anxiety with values on average 5.42 ± 4. According to laboratory research methods, hemoglobin values averaged 116 ± 179 g/l. The level of ESRD was 0.2 ± 15.3 mg/l, and the level of ESR was 2 ± 23.

Conclusion: Some patients who have suffered a knee injury more than 1 month ago experience severe pain and have impaired joint function. In a number of patients, 26% (26 out of 100 people), of whom 18 are women, the remaining 8 are men, there are signs of neuropathic pain, central sensitization, increased BMI, psychoemotional disorders and fibromyalgia, which aggravates the course of the post-traumatic period. Patients with chronic pain after an injury need further follow-up to clearly identify predictors of the occurrence of this condition in order to predict the occurrence of post-traumatic osteoarthritis and the formation of correct treatment tactics.

P134
UPPER LIMB ORTHOPEDIC ASSESSMENT IN PARAPLEGIC AND TETRAPLEGIC PATIENTS AND CLINICAL OUTCOMES ON THE SHOULDER, ELBOW, WRIST AND HAND

A. Cliquet Jr.[1]

[1]Dept. of Orthopedics, Rheumatology and Traumatology, Faculty of Medical Sciences, UNICAMP, Campinas, SP, Brazil

Objective: Spinal cord injured individuals (SCI) do present joint lesions on their overused upper limbs, being wheelchair users and due to upper limb effort during daily activities such as transferring. This work aimed at providing an assessment on the orthopedic comorbidities as well as feasible approaches towards clinical improvements on the shoulder, elbow, wrist and hand.
Methods: MRI, disability of the arm, shoulder and hand (DASH) score, bone densitometry (DXA), plain radiography and clinical measurements such as active and passive range of motion were performed in patients attending the SCI Outpatient Clinic of the University Hospital, including those patients involved in Paralympic Sports. Rehabilitation protocols were applied.
Results: On the shoulder, 10% of the tetraplegic athletes (sample of 10 rugby players) did present tendinopathies against 30% of those sedentary ones (sample of 10 tetraplegics). Joint strength, endurance and function were improved (sample of 17 subjects) by protocols of the rehabilitation programme of specific physiotherapy training of the scapula muscles making use of elastic bands. Rugby training also improved bone mineral content in the arms. On the elbow joint, clinical and radiological abnormalities (osteoarthritis, subclinical acute and chronic pain) were noticed in SCI patients, assessed through bilateral X-ray exams, on 10 paraplegics and 10 tetraplegics, such comorbidities being more evident (90%) on the latter pathology. Related to wrist and hand, SCI patients (8 paraplegics, 6 tetraplegics) presented minimal radiological signs of osteoarthritis.
Conclusion: Regular wheelchair rugby enhances bone mass and sedentary tetraplegic individuals do present more risk of injury to the acromioclavicular joint. Elbow osteoarthritis, being a limiting disease to the patients, requires both, early diagnosis and treatment through rehabilitation techniques.

P135
ÉVALUATION OF BONE MINERAL DENSITY IN ALGERIAN PATIENTS WITH PLAQUE PSORIASIS: A CASE–CONTROL STUDY

A. Djebbari[1], A. Abiayed[2], S. Bennedjma[2], H. M. Houbi[3], S. Oulebssir[1], A. Beguiret[3]

[1]HCA Hospital Koubap, [2]HCA Hospital, [3]HCA Hospital, Kouba, Algeria

Objective: Psoriasis is a common chronic skin diseases, causing plaques. It is associated with many comorbidities. A link had been found between psoriasis and osteoporosis in some studies where various mechanisms may be involved, including increased inflammatory cytokines, such as interferon-gamma, IL-6, and TNFs. Moreover, psoriasis medications could cause abnormal BMD, which is measured by DXA as a gold standard method. Because the poverty of literature on the subject and the conflicting results in previous studies, for the first time in Algeria, we conducted a study to assess BMD in plaque psoriasis patients compared with a healthy control group to Improve the management of comorbidities associated with psoriasis. Our objectives were to evaluate the BMD measured by DXA in Algerian patients presenting a plaque psoriasis and identify associated factors with low BMD.
Methods: In this case–control study, 90 participants were enrolled from Algiers and Blida dermatology clinics University Hospital in Algeria between October 2019 and April 2022. The case group consisted 48 patients aged 20–65 from healthy subjects referred to these clinics for routine examination. Patients with psoriatic arthritis, chronic inflammatory diseases, endocrine disorders, a history of treatment with systemic drugs affecting BMD (including corticosteroids, disease-modifying antirheumatic drugs (DMARDs), and biologic drugs), individuals undergoing phototherapy, and those with a history of smoking and alcohol use were all excluded from the study. All participants were examined and evaluated for height, weight, BMI, medication history, pelvic fracture history, and chronic diseases. DXA was used to measure BMD at the 2nd and 4th lumbar vertebrae and the pelvis, and the results were categorized by T-score. The psoriasis area severity index (PASI) score was used to determine the severity of psoriasis.
Results: This study was conducted on 45 patients with a mean age of 47.23 ± 8.11 and 45 healthy controls with a mean age of 49.26 ± 6.7 to assess the relationship between BMD and plaque psoriasis. The mean T-score in the case and control groups were -0.56 ± 1.02 and -0.25 ± 0.65, respectively ($P = 0.325$). The mean T-score had a significant inverse correlation with an age of 42 y or above ($P < 0.001$), disease duration of more than 6 y ($P = 0.05$), and PASI score ($P < 0.001$), but had a positive correlation with sunlight exposure ($P < 0.001$), and overweight ($P < 0.001$).
Conclusion: Our study revealed that in Algerian patients, the mean T-score in patients with plaque psoriasis was significantly lower than the controls among those aged 42 or above. Furthermore, T-score had a significant inverse relationship with age, disease duration, and PASI score, but a significant direct relationship with overweight and sunlight exposure, so in addition to routine therapy we suggest treatments given to this group of plaque psoriasis patients to prevent osteoporosis.

P136
OBESITY IS THE MOST PREVALENT COMORBIDITY IN A NEWLY DIAGNOSED PSORIATIC ARTHRITIS POPULATION: ALGERIAN COHORT OF DERMATOLOGIC EARLY DETECTION

A. Djebbari[1], S. Bennedjma[2], S. Oulebssir[1], A. Abiayed[2]

[1]HCA Hospital Koubap, [2]HCA Hospital, Kouba, Algeria

Objective: Psoriatic arthritis (PsA) is a heterogeneous disease with articular extra-articular disease features. PsA is associated with important comorbidities: cardiovascular, gastrointestinal, infectious, malignant, and psychiatric. However, they are less studied in PsA compared to other chronic inflammatory arthritis. The aim of this study is to describe the prevalence of comorbidities in PsA newly diagnosed among a population of psoriasis screened by the PURE4 questionnaire recruited dermatology clinics.
Methods: Between 2019–2022, a multicenter cross-sectional trial including patients selected in dermatology clinics using PURE 4 questionnaire, and a diagnosis of PsA confirmed by CASPAR criteria. Data collected: demographical, clinical (affected joints, axial involvement, enthesitis, dactylitis), biological, and treatment related. Data on comorbidities and risk factors were collected according to the EULAR recommendations on reporting comorbidities in chronic inflammatory rheumatic diseases in daily practice.
Results: In all, 43 PsA patients were included: 14 (33%) women, mean age $\pm$ standard deviation 50.76 ± 12.39 y, 44% of patients with PsA had psoriatic nail disease and scalp involvement seen in 37%. With reference to the PsA type, 30% patients presented with polyarthritis, 44% with oligoarthritis, 39% with enthesitis, dactylitis in 23% and 13% with axial arthritis. Most of them had low or

moderate disease activity and 30% were taking a biologic. The most prevalent comorbidities were: obesity 18 (42%), dyslipidaemia 9 patients (21%), hypertension 7 (17%), diabetes 6 (14%) and ischemic heart disease 2 (4.65%). Cardiovascular events correlated with obesity ($p < 0.001$), smoking ($p < 0.001$), current moderate/severe psoriasis ($p = 0.01$) and PsA disease activity ($p < 0.01$). Regarding infectious comorbidities: 4 patients (9.3%) had a history of pulmonary infection, (4%) chronic viral hepatitis, of which 2 with B virus and 2 with C virus. One patient was diagnosed with neoplasia, but no correlation was identified with any of the clinical, biological or treatment related included variables. Only 4 patients (9.3%) were diagnosed with depression and 11.63% had inflammatory bowel disease.

Conclusion: PsA newly diagnosed is associated with a high prevalence of comorbidities, especially obesity and cardiovascular diseases. These comorbidities should be screened and taken into consideration in the therapeutic and management of PsA patients.

P137
EARLIER AGE OF PSORIASIS ONSET, HIGH CRP LEVEL AT DIAGNOSIS AND LOW EDUCATIONAL LEVEL ARE ASSOCIATED WITH DIAGNOSTIC DELAY IN PSORIATIC ARTHRITIS

A. Djebbari[1], A. Gouder[2]

[1]HCA Hospital Koubap, Kouba, [2]Hmruc, Constantine, Algeria

Objective: Psoriatic arthritis (PsA) is a chronic inflammatory disease characterized by cutaneous psoriasis, with peripheral and axial joint damage. Early diagnosis of PsA is important for improving long-term outcomes. Trends in diagnostic delay of PsA in Algeria (Africa) and factors associated with delay in diagnosis have not been well studied. Aims: (1) to determine the diagnostic delay in PsA in Algerian population from 2016–2022, and (2) to identify demographic and clinical characteristics associated with diagnostic delay in PsA.

Methods: We conduct a retrospective, population-based cohort of adult patients with PsA in Algeria from 2016–2022. All patients met the classification criteria. Diagnostic delay was defined as the time from any patient-reported PsA-related joint symptom to a physician diagnosis of PsA. Factors associated with delay in PsA diagnosis were identified through logistic regression models.

Results: 78 PsA were recruited from 2016–2022 with a physician or rheumatologist diagnosis. Mean (SD) age was 51.2 (14.8) y and 62% were male. Median time from symptom onset to physician diagnosis was 2.9 y (IQR 0.8–9.3). By 6 months, 10 (12.8%) received a diagnosis of PsA, 29 (37.1%) by 1 y, and 39 (50%) by > 2 y after symptom onset. No significant trend in diagnostic delay was observed over calendar time. Earlier age at onset of psoriasis symptoms ($p < 0.0001$), low educational level ($p < 0.001$) and higher CRP level were associated with a diagnostic delay of > 2 y, whereas patients with late onset psoriasis symptoms, high activity (PASI) were associated with a lower likelihood of delay.

Conclusion: Our study highlights that half of PsA patients had a diagnostic delay of > 2 y. Patients with younger age at psoriasis symptom onset, higher CRP level at psoriasis diagnosis or lower educational level before diagnosis were more likely to have a diagnostic delay of > 2 y, whereas patients with late onset psoriasis symptoms, high activity (PASI) were less likely to have a diagnostic delay.

P138
COMPARISON OF THE AVERAGE DAILY PRODUCTION OF VITAMIN D3 IN MOROCCAN MEN BETWEEN THE SUMMER AND WINTER SEASONS

A. E. El Maataoui[1], A. B. Belbo[1], D. M. Dandan[1]

[1]IBN Zohr Univ. Faculty of Medicine and Pharmacy Agadir, Agadir, Morocco

Objective: Hypovitaminosis D is a global health problem, even in countries with abundant sunlight. Despite Morocco's geographical location, the prevalence of vitamin D deficiency and insufficiency is reported to be high. In men and women, the prevalence of vitamin D deficiency was 4.4% and 8.6%, respectively. Also, the prevalence of vitamin D (25(OH)D) insufficiency was 85.2% and 77.4% in men and women, respectively. The aim of this study was to estimate the average amount of vitamin D3 produced by sunlight exposure in Moroccan adult men during summer and winter, based on their everyday outdoor ultraviolet doses.

Methods: This is a prospective study that recruited male participants exclusively and was conducted in both summer 2022 and winter 2023. All participants were Moroccan and resided in the Agadir area of Morocco (30.428° N). The sample size was calculated using the formula for sample size: $n = z^2 \times p(q)/d^2$. We included 324 men in the summer and 345 in the winter, all of whom were apparently healthy and from diverse socioeconomic backgrounds, ranging in age from 18–100 years old. Data were collected through a face-to-face interview questionnaire that assessed sun exposure variables for estimating the vitamin D3 produced by sunlight. The questionnaire also included sociodemographic and anthropometric variables, as well as medical history. The daily estimate of synthesized vitamin D3 was calculated using the following equation: estimate vitamin D3 (IU) per day = vitamin D dose (VDD) $\times$ (4900 IU) $\times$ skin type factor $\times$ fraction of body exposed $\times$ age factor.

Results: The study included participants aged 20–60, with 62.33% in the 20–40 age group and 23.31% in the 40–60 age group. Only 10.76% were over the age of 60. The majority of participants had Fitzpatrick skin type 3 (72.94%). During the summer period, vitamin D synthesis was below the recommended value of 600 IU/d for 0% of participants, between 600–1200 IU/d for 44.44% of participants, and $\geq$ 1200 IU/d for 55.55% of participants. During the winter period, 13.33% of participants had an average vitamin D synthesis below the recommended value of < 600 IU/d, while 74.20% had a synthesis between 600–1200 IU/d, and 12.46% had a synthesis of $\geq$ 1200 IU/d. The most important factors correlated with vitamin D production, in order of importance, are the amount of skin exposed to sunlight, the time of year, age, and duration of sun exposure.

Conclusion: In Moroccan men, the predictors of vitamin D3 production through sunlight exposure are the fraction of the body exposed, age, and season. These results do not correlate with the findings of Moroccan studies which have reported a high prevalence of vitamin D status insufficiency and the prevalence of vitamin D deficiency. All these studies used immunological techniques and not the reference technique for vitamin D determination.

P139
ONCE YEARLY ZOLEDRONIC ACID REDUCED THE RATE OF NEW CLINICAL FRACTURES AND IMPROVED SURVIVAL

S. Z. Zidan[1], A. E. Elsalmawy[2], M. M. Mouhsen[2], I. M. Malik[2], A. B. Butt.[2]

[1]North Middlesex Univ. Hospital, London, [2]Southend Univ. Hospital, Southend-on-sea, UK

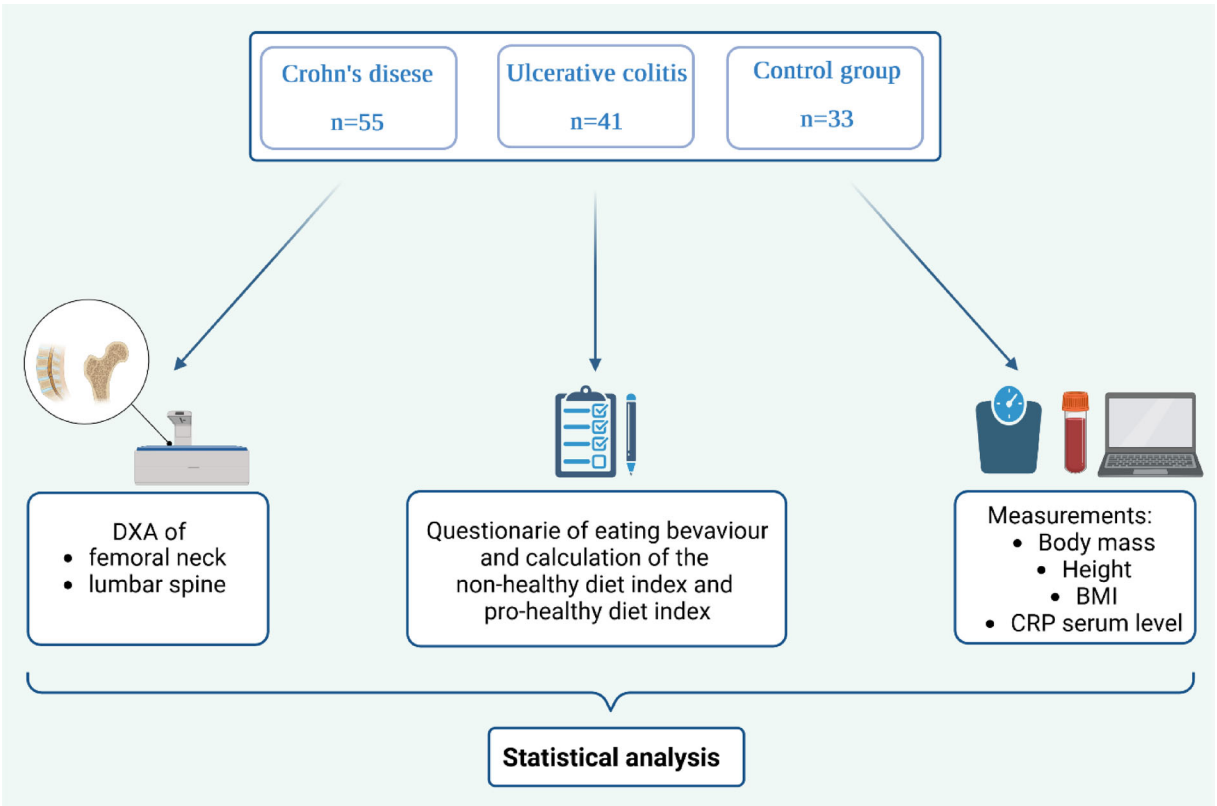
Objective: Hip fractures are associated with high mortality and a substantial economic burden. Given its association with older age and the rate of aging of the global population, hip fractures are likely to become even more frequent events to bring patients to healthcare systems worldwide,
Methods: In this study, 656 patients with a fragility hip fracture were treated in Southend University Hospital and North Middlesex hospitals between 2021–2022, the first group of 356 patients was assigned to receive yearly intravenous zoledronic acid (at a dose of 5 mg), and 300 patients did not receive it either due to low creatinine clearance, ongoing renal disease, or due to patient preference. The infusions were first administered during the admission after surgical treatment of a hip fracture. All patients (mean age, 80.2 y) received supplemental vitamin D and calcium. The median follow-up was 1 y. The primary endpoint was a new clinical fracture.
Results: The rates of any new clinical fracture were 8.6% in the zoledronic acid group and 13.9% in the second group, with a 35% risk reduction with zoledronic acid (P = 0.001); the respective rates of a new clinical vertebral fracture were 2.7% and 3.8% (P = 0.02), and the respective rates of new nonvertebral fractures were 7.6% and 10.7% (P = 0.03). In the safety analysis, 8 of 356 patients in the zoledronic acid group and 19 of 300 patients in the second group died. The most frequent adverse events in patients receiving zoledronic acid were pyrexia, myalgia, and bone and musculoskeletal pain. No cases of osteonecrosis of the jaw were reported, and no adverse effects on the healing of fractures were noted. The rates of renal and cardiovascular adverse events, including atrial fibrillation and stroke, were similar in the two groups.
Conclusion: An annual infusion of zoledronic acid during hospital admission after repair of a low-trauma hip fracture was associated with a reduction in the rate of new clinical fractures and improved survival.

P140
DOES THE QUALITY OF DIET AFFECT BONE MINERAL DENSITY IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE?

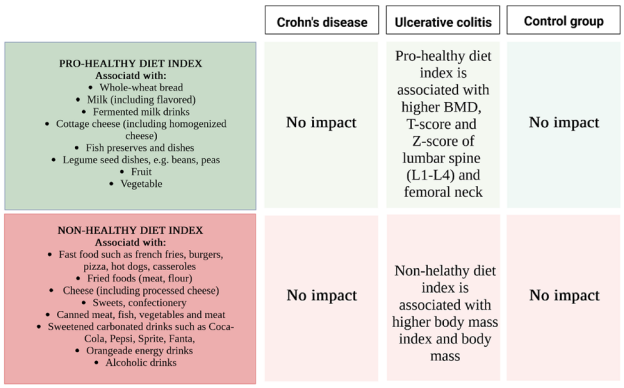
A. E. Ratajczak-Pawłowska[1], A. Szymczak-Tomczak[1], M. Michalak[2], A. M. Rychter[1], A. Zawada[1], K. Skoracka[1], A. Dobrowolska[1], I. Krela-Kaźmierczak[1]

[1]Dept. of Gastroenterology, Dietetics and Internal Diseases, [2]Dept. of Computer Science and Statistics, Poznan Univ. of Medical Sciences, Poznań, Poland

Objective: Looking for an association between BMD and diet quality among IBD patients.
Methods: We enrolled 96 IBD patients (55 with Crohn's disease—CD, 41 with ulcerative colitis—UC) and 33 healthy adults (control group—CG) at the age of 18–50, recruited at the Dept. of Gastroenterology, Dietetics and Internal Medicine, Poznan Univ. of Medical Sciences between 2020–2021. All subjects filled in the Questionnaire of Eating Behaviour (QEB), developed by the Polish Academy of Sciences, based on which pro-healthy and non-healthy diet indexes were calculated. Additionally, BMD, T-score and Z-score of the lumbar spine (L1–L4) and femoral neck (FN) were assessed using the Lunar DPX-Plus device (Lunar Inc., Madison, WI, USA). Finally, we carried out an appropriate statistical analysis. The summary of methods is presented in Fig. 1.



Results: Patients with UC and CD presented lower BMD, T-score and Z-score of L1–L4 and FN than the control group. Pro-healthy diet index was significantly higher among the control group than CD and UC. On the other hand, also non-healthy diet index was significantly higher among the control group than UC, but not CD. However, C-reactive protein concentrations were significantly lower among CG than CD and UC. We did not find differences between groups after dividing pro-healthy and non-healthy scores into low, medium and high categories. In the UC group, but not CD and CG, the pro-healthy index correlated positively with BMD, T-score and Z-score of L1–L4 and FN. Additionally, we find a positive correlation between non-healthy scores and BMI and body mass among UC patients. The summary is presented in the Fig. 2.



Conclusion: Chronic inflammation may affect the pro-healthy indexes characterised by, among other high intake of dairy, fruits, vegetables and whole grains. It should be noted that if IBD patients are following IBD-specific recommendations, the pro-healthy index can be lower. On the other hand, IBD patients avoided high-processed food, sweets and energy drinks, associated with a high non-healthy index. Nevertheless, a higher pro-healthy index is probably associated with a higher intake of nutrients, positively affecting BMD.

P141
CALCIUM, PHOSPHORUS AND MAGNESIUM INTAKE AND BONE MINERAL DENSITY IN INFLAMMATORY BOWEL DISEASE

A. E. Ratajczak-Pawłowska[1], A. Szymczak-Tomczak[1], M. Michalak[2], A. Zawada[1], A. M. Rychter[1], K. Skoracka[1], A. Dobrowolska[1], I. Krela-Kaźmierczak[1]

[1]Dept. of Gastroenterology, Dietetics and Internal Diseases, [2]Dept. of Computer Science and Statistics, Poznan Univ. of Medical Sciences, Poznań, Poland

Objective: To look for an association between calcium, phosphorus and magnesium intake and BMD in inflammatory bowel disease (IBD).
Methods: The study included 26 patients with Crohn's disease (CD), 30 ulcerative colitis (UC) patients and 31 healthy adults (control group) aged 18–50 y, recruited between 2020–2021. The dietary intakes of participants were assessed by a 4-d 24-h dietary recall, and these data were analysed by the DIETA 6.0 food analyser. We also assessed the BMD, T-score and Z-score of the lumbar spine (L1–L4) and femoral neck (FN) using the Lunar DPX-Plus device (Lunar Inc., Madison, WI, USA).
Results: CD patients presented a significantly lower calcium intake and significantly lower RDAs (recommended dietary allowances) coverage for calcium and phosphorus than healthy adults. We did not find significant differences in caloric intake between groups. Phosphorus and magnesium intakes, as well as the RDA coverage for magnesium were not significantly different among groups. Only 3.8%, 13.3% and 29.0% of patients with CD, UC and healthy adults, respectively, met the calcium needs. The RDA coverage for magnesium was also low and was 19.2%, 23.3% and 48.4% for CD, UC and the control group, respectively. CD and UC patients had lower T-scores and Z-scores of the FN and L1–L4. Among individuals with insufficient intakes of calcium or magnesium (< RDAs) or higher intake of phosphorus (≥ RDA), low BMD (including osteopenia and osteoporosis) was observed among CD and UC patients more often than controls. We did not find any correlation between calcium, phosphorus and magnesium intakes and BMD, T-score and Z-score of FN and L1-L4.
Conclusion: The diet of CD patients is poorer in calcium than healthy adults. However, the RDA coverage for calcium is low in both IBD patients and the control group. Among those with insufficient calcium and magnesium intake, the risk of low BMD is higher among CD and UC patients than in controls. Probably, IBD patients are more sensitive to nutrients deficiencies or other factors that affect patients' BMD. Although we did not find any significant correlations between calcium, magnesium or phosphorus intakes with bone parameters, we suppose that intake of these nutrients has an impact on bone, but we need studies including bigger groups.

P142
CALCIUM (CA) ISOTOPE COMPOSITION IN SERUM AND URINE FOR THE ASSESSMENT OF BONE CALCIUM BALANCE (BCAB): RESULTS FROM A POSTMARKET SURVEILLANCE CLINICAL FOLLOW-UP STUDY ON 2409 PARTICIPANTS

A. Eisenhauer[1,2], A. Heuser[1,2], J. Oehme[2], M. Lutz[2], M. Müller[2,3]

[1]GEOMAR Helmholtz-Centre for Ocean Research, [2]Osteolabs GmbH, [3]Univ. Clinic Schleswig–Holstein, Kiel, Germany

Objective: Ca isotope marker (CIM) measured in serum (δ44/42Ca-serum) and urine (δ44/42Ca-urine) has been demonstrated in earlier studies to be a sensitive, reliable, and minimal invasive BCaB marker. This study aimed to confirm the validity of the CIM approach to a larger randomized number of people not selected based on specific criteria, but rather showing a wide range of diseases and therapies.
Methods: The 2409 participants of this surveillance study were undergoing CIM testing in 2020–2023. Urine was self-collected, while blood was collected in doctor's office and stored for transport in suitable containers. Individual data were reported: current medical conditions, the last 4 years fracture history, current medication, and intake of supplements, e.g., vitamin D and Ca. Chemical preparation procedures followed standardized procedures. Ca isotopes were measured using a Neptune Plus (Thermo Fisher Scientific) applying a medium mass resolution.
Results: Factors affecting the musculoskeletal metabolism were sensitively reflected by a change in the CIM value in serum and urine. Osteoporosis, osteolytic metastases, hyperthyroidism, specific medications, and antihormone therapies associated with a negative BCaB were reflected by CIM values below the threshold value. Osteoprotective medications such as bisphosphonates, denosumab, and romosozumab, which are associated with a positive BCaB, were reflected by CIM values above the threshold values. The study revealed also that vegans show the highest CIM values possibly reflecting a low Ca intake with increased PTH secretion.
Conclusion: CIM values qualify as a strong and independent marker reflecting BCaB. The high CIM sensitivity allows the early risk assessment of diseases interfering with the musculoskeletal system before symptoms appear. Furthermore, CIM qualifies for near

realtime therapy monitoring to ensure sufficient osteoprotective therapy and contributes to a general reduction in fracture risk.

P143
CORTICAL AND TRABECULAR BONE INVOLVEMENT IN MEN1-ASSOCIATED PRIMARY HYPERPARATHYROIDISM

A. Eremkina[1], S. Pylina[1], A. Gorbacheva[1], L. Humbert[2], M. L. Picazo[2], N. Mokrysheva[1]

[1]Endocrinology Research Center, Moscow, Russia, [2]3D-Shaper Medical, Barcelona, Spain

Objective: Primary hyperparathyroidism (PHPT) is the most common MEN1 component. Data on the bone involvement in MEN1-associated PHPT (mPHPT) compared to sporadic one (sPHPT) remain contradictory. Aim of this study was to compare the severity of bone involvement in mPHPT and sPHPT.

Methods: A single-center retrospective study was conducted among young (< 50 y) age-matched patients in the active phase of PHPT (group 1—mPHPT, n = 22; group 2—sPHPT, n = 37). The analysis included the main parameters of calcium-phosphorus metabolism, bone remodeling markers, BMD assessment at three sites (femur, spine and forearm) using DXA, and the additional 3D-Shaper advanced analysis.

Results: The median duration of PHPT was comparable in both groups: mPHPT—1 y [0; 2] vs. sPHPT—1 y [0; 1], (p = 0.764, U-test). There were no differences in the main parameters of calcium-phosphorus metabolism, as well as in bone remodeling markers (osteocalcin, β-CrossLaps, ALP). The summary frequency of bone disease in mPHPT patients was higher than in sPHPT: 54 vs. 22% (p = 0.0085). Statistically significant differences were revealed in BMD and Z-values of the femoral neck, total hip, lumbar spine and radius 33% (except radius total), all of them were lower in mPHPT group ($p < 0.05$ for all). 3D-Shaper measurements in total hip region including cortical surface BMD, cortical volumetric BMD, cortical thickness, trabecular volumetric BMD, cortical and trabecular bone mineral content showed more severe changes in mPHPT ($p < 0.05$ for all). The groups differed also in areal BMD (p = 0.001).

Conclusion: mPHPT may be accompanied by a more severe decrease in BMD by DXA. The 3D-Shaper advanced analysis also confirmed more significant changes of both cortical and trabecular bone in mPHPT compared to sporadic disease.

P144
LONG-TERM BONE MINERAL DENSITY CHANGES IN KIDNEY TRANSPLANT RECIPIENTS TREATED WITH DENOSUMAB: QUASI-EXPERIMENTAL STUDY

A. F. Fassio[1], F. P. Pollastri[1], S. A. Andreola[2], D. G. Gatti[1], F. P. M. Ferraro[2], G. G. Gambaro[2], L. S. Stefani[2], C. B. Benini[1], G. I. Galvagni[1], R. M. Rossini[1], A. G. Adami[3]

[1]Rheumatology Unit, [2]Nephrology Unit, [3]Rheumatology Unit, Univ. of Verona, Verona, Italy

Objective: Data on the effectiveness of denosumab on osteoporosis after kidney transplantation are limited. We investigated the long-term BMD changes in kidney transplant recipients (KTRs) treated with denosumab compared to untreated KTRs. For these reasons, we performed a quasi-experimental study to investigate the long-term BMD changes over four years in KTRs receiving treatment with denosumab compared to a cohort of age and sex-matched untreated KTRs.

Methods: We enrolled KTRs treated with denosumab 60 mg/six months for 4 years. An untreated group of sex and age-matched KTRs with a 1:1 ratio was included. The primary outcome was BMD changes assessed by DXA over 4 years. Data on serum creatinine, alkaline phosphatase (ALP), PTH, and 25-hydroxyvitamin D were collected. All patients received oral cholecalciferol and calcium supplementation.

Results: 23 denosumab-treated KTRs were enrolled, and 23 untreated KTRs (Table 1). The median time from transplant to the start of denosumab was 4 y (range 0;24). The denosumab group showed a significant increase from baseline in BMD at the lumbar spine (LS) (9.0 ± 10.7%, $p < 0.001$), and total hip (TH) (3.8 ± 7.9%, p = 0.041). The untreated group showed a significant decrease at all sites (− 3.0 ± 7%, p = 0.041 at the LS; − 6.3 ± 9.2%, p = 0.003 at the TH; − 6.7 ± 9.3%, p = 0.003 at the FN) (Fig. 1, panels A and B). The between-group differences in percent BMD changes were statistically significant at all sites. Similar results were found for the respective Z-scores. The ALP serum levels significantly decreased from baseline only in the denosumab group, with a significant between-group difference (p = 0.032). No significant differences in serum creatinine, hypocalcaemic events or acute graft rejection rates were observed.

Table 1. Baseline characteristics of the two groups. Data are expressed as mean (SD) or absolute number (percentage). M, males; F, females, BMI, body mass index; T2DM, type 2 diabetes mellitus; DXA, dual-energy X-ray absorptiometry; GCs, glucocorticoids; SD, standard deviation; LS, lumbar spine; TH, total hip; FN, femoral neck; Ns, nonsignificant; 25OHD, 25-hydroxyvitamin D; ALP, alkaline phosphatase; PTH, parathyroid hormone. *defined as having a T-score < −2.5 at least one of the three sites. Square brackets show the reference range of normality.

	Denosumab (N=23)	Controls (N=23)	p-value
Sex (M:F)	10:13	10:13	Ns
Age (y)	61.5 (7.2	61.4 (9.0	Ns
BMI (kg/m^2)	23.1 (1.8	24.3 (4.3	Ns
T2DM	3 (15%)	3 (15%)	Ns
History of previous haemodialysis	14 (61%)	17 (74%)	Ns
Years from transplant to baseline DXA (and denosumab start, if appropriate; median [interquartile range] and range)	4 [1.5;10] 0-24	5 [2;11] 0-23	Ns
Previous history of fragility fractures	7	4	Ns
Chronic GCs	23 (100%)	23 (100%)	/
Treatment with calcimimetics	4 (17%)	6 (26%)	Ns
Treatment with active vitamin D compounds	6 (26%)	7 (30%)	Ns
Treatment with active vitamin D analogues	0	0	/
25OHD (nmol/L)	48.6 (26.7)	57.2 (37.3)	0.067
Subjects with 25OHD <30 nmol/L	6 (26%)	5 (21%)	Ns
Serum corrected calcium (mg/dL)	9.6 (0.5)	9.5 (0.7)	Ns
ALP (U/L)	83.4 (43.5)	77.8 (29.1)	Ns
PTH (pmol/L)	13.0 (10.1)	18.9 (14.8)	Ns
Serum creatinine (mg/dL)	1.31 (0.45)	1.27 (0.43)	Ns
LS T-score	−2.70 (1.20)	−1.42 (1.70)	0.006
TH T-score	−2.35 (0.77)	−1.40 (1.16)	0.014
FN T-score	−2.58 (0.52)	−1.98 (1.04)	0.002
LS Z-score	−1.62 (1.31)	−0.60 (1.50)	0.019
TH Z-score	−1.43 (0.53)	−0.61 (0.96)	0.001
FN Z-score	−2.58 (0.51)	−1.95 (1.02)	0.085
Number of osteoporotic subjects*	22 (95%)	9 (39%)	<0.001

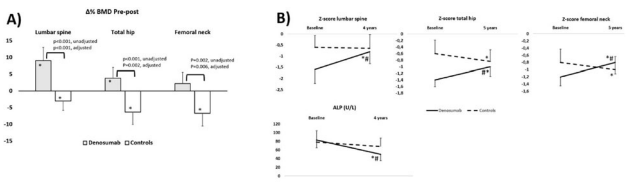


Figure 1: **panel A)** absolute BMD changes after four years of observation of the denosumab and control groups. Horizontal square brackets and the p-values show the between-groups differences, unadjusted and after adjustment for respective baseline Z-score, PTH and 25(OH)D. * p<0.05 *vs* baseline. **Panel B)** BMD and ALP changes expressed as Z-scores after four years of observation. Error bars show 95% confidence intervals. * p<0.05 vs baseline. # p<0.05 vs controls.

Conclusion: Four years of denosumab therapy were associated with increased BMD in KTRs, while untreated KTRs showed significant BMD losses at all sites.

P145
RADIOFREQUENCY ECHOGRAPHIC MULTI-SPECTROMETRY AND DXA FOR THE EVALUATION OF BONE MINERAL DENSITY IN SUBJECTS WITH AXIAL SPONDYLOARTHRITIS

A. F. Fassio[1], F. P. Pollastri[1], G. I. Galvagni[1], D. G. Gatti[1], C. B. Benini[1], O. V. Viapiana[1], R. M. Rossini[1], F. R. Ruzzon[1], A. G. Adami[2]

[1]Rheumatology Unit, [2]Rheumatology Unit, Univ. of Verona, Verona, Italy

Objective: Osteoporosis and bone loss represent a significant complication in axial spondyloarthritis (axSpA) [1]. Radiofrequency echographic multi-spectrometry (REMS) is a novel technique already validated in assessing BMD in postmenopausal osteoporosis [2]. It is characterized by its agile machinery and the absence of ionizing radiation. Additionally, REMS is robust against artifacts, which are known to affect DXA, especially at the lumbar spine (LS)—including aortic calcifications and osteophytes [3]. The aim of this real-life, cross-sectional, explorative study was to compare REMS with DXA in assessing BMD in patients affected by axSpA.
Methods: LS and femur scans were acquired using both techniques, including LS latero-lateral (LL) DXA scans. ANOVA for repeated measures was utilized to compare the differences in T-scores among DXA anteroposterior (AP), LL, and REMS scans at the LS, as well as between DXA and REMS T-scores at the total hip (TH) and femoral neck (FN). The correlation between the T-scores at the hip site was assessed using Pearson's correlation coefficient.
Results: A total of 55 patients were enrolled (Table 1). No significant differences were found between the BMD T-scores measured through DXA or REMS at the femur. At the lumbar spine, the DXA AP mean T-score was significantly higher than those obtained through LL DXA and REMS (Fig. 1). A strong positive correlation was observed between the T-scores obtained with the two techniques, both at the TH ($r = 0.80$, $p < 0.01$) and FN ($r = 0.77$, $p < 0.01$).

Table 1. Sample characteristics. Data expressed as mean (standard deviation).

Sample size	55
M:F	35:20
Age (y)	45.2 (13.6)
BMI (kg/m^2)	25.1 (4.8)
Disease duration (y)	9.5 (7.6)
r-AxSpA	60%
HLA B27	48%

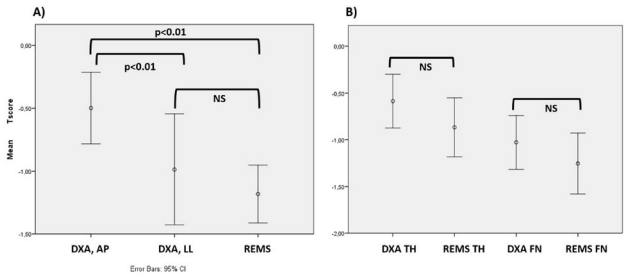


Figure 1: T-score comparison between the DXA and REMS techniques at the lumbar spine (panel A) and hip site (panel B).
Abbreviations: anteroposterior, AP; latero-lateral, LL; total hip, TH; femoral neck, FN; not significant, NS.

Conclusion: Our findings indicate a notable concordance between DXA and REMS in assessing T-scores at the femoral sites in SpA patients. Particularly at the LS, REMS may offer more precise BMD measurements in this distinct patient group, where DXA assessments are potentially confounded by the presence of syndesmophytes.
References:

1. Yan F, et al. Osteoporos Int 2024;35:25
2. Adami G, et al. Bone 2020;134:115,297
3. Fitzgerald G, et al. Int J Rheum Dis 2020;23:358

P146
ROLE OF SIRT1, NOX4 AND FNDC5 IN AGE-RELATED MUSCULOSKELETAL DISEASES: A NEW PERSPECTIVE TO FIGHT CELLULAR AGING

A. Falvino[1], I. Cariati[2], R. Bonanni[3], B. Gasperini[1], A. Chiavoghilefu[4], A. Botta[1], V. Tancredi[2], U. Tarantino[4]

[1]Dept. of Biomedicine and Prevention, [2]Dept. of Systems Medicine, [3]Dept. of Biomedicine and Prevention, [4]Dept. of Clinical Sciences and Translational Medicine, Univ. of Rome Tor Vergata, Rome, Italy

Objective: Several molecular mediators play a key role in the aging process that characterizes osteoarthritis and osteoporosis by regulating cellular senescence, oxidative stress, and telomere shortening [1]. This study aimed to explore the different molecular mediators involved in the aging process. Specifically, we investigated the expression patterns of SIRT1, known to promote longevity, FNDC5, an exercise-induced myokine, and NOX4, an indicator of oxidative stress, in the muscle and cartilage bone tissues of osteoarthritic and osteoporotic patients, with the aim of identifying strategies to mitigate age-related musculoskeletal diseases [2–3].
Methods: Five osteoporotic patients and five osteoarthritic patients, undergoing hip arthroplasty for fragility fracture or coxarthrosis, respectively, were enrolled and classified following clinical and instrumental assessments. Surgical biopsies of bone, muscle, and cartilage tissues were used to perform histological, morphometric, and immunohistochemical analyses.
Results: Clinical and instrumental evaluations revealed significantly lower T-Score values in osteoporotic patients, with no age-related differences. Morphological and morphometric analyses demonstrated decreased bone volume, reduced trabecular thickness, and increased trabecular separation in osteoporotic compared to osteoarthritic bone tissue. Similar marked alterations were observed at the muscular and cartilaginous levels, including muscle fiber atrophy and the presence of hypertrophic chondrocytes. Immunohistochemical analysis revealed distinct expression patterns, with increased NOX4-positive cells and reduced FNDC5 and SIRT1-positive cells.
Conclusion: Cellular aging underlying age-related musculoskeletal disorders may result from altered expression patterns of SIRT1 and NOX4. Interestingly, a positive correlation between SIRT1 and FNDC5 expression levels suggests FNDC5 as a potential mediator of SIRT1's beneficial effects in musculoskeletal tissues.
References:

1. Almeida M, Porter RM. Bone 2019;121:284
2. Sánchez B, et al. Expert Rev Mol Med 2022;25:e4
3. Schröder K. Free Radic Biol Med 2019;132:67

P147
EFFICACY AND SAFETY IN THE USE OF ROMOSOZUMAB IN POSTMENOPAUSAL WOMEN WITH SEVERE OSTEOPOROSIS AT HIGH RISK OF FRACTURE IN AN OUTPATIENT CASE SERIES FROM THE MARCHE REGION

A. Farina[1], E. Pingiotti[1], G. P. Martino[1], G. Bitti[1], S. Angelici[1]

[1]Internal Medicine, Ospedale Civile A. Murri, Fermo, Italy

Objective: To evaluate the efficacy and safety of the use of romosozumab (210 mg sc/28d) in postmenopausal women with severe osteoporosis at high risk of fracture in an outpatient series from the Marche region (1,2). Evaluation of patients treated in "real life" at a rheumatology center in the Marche (Rheumatology Outpatient Clinic c/o Internal Medicine Unit of Fermo).
Methods: Analysis on n. 6 postmenopausal women suffering from severe osteoporosis at high risk of fracture treated with romosozumab 210 mg sc/28d in association with calcium and vitamin D3. Demographic data, disease duration, comorbidities, and prior therapy were recorded at baseline. At baseline, at 3 months, at 6 months, at 12 months, the following variables were collected: hypocalcemia, dosage of vitamin D3, CTX, new fractures, cardiac complications (echocardiographic evaluation), cerebrovascular events; BP checks, cholesterol dosage, smoking abstention, bone densitometry based on the radiofrequency echographic multispectrometry (REMS) method. For each patient, adverse events and any suspension of therapy due to ineffectiveness or intolerance were recorded.
Results: No. 6 patients were included in the analysis with a median follow up of 9 months. The study demonstrated the maintenance rate is 85% at 6 months of all patients who have undergone therapy with romosozumab maintaining normal values of calcemia, vit d3, CTX, a picture of improvement in bone densitometric values with the REMS method in 75% (n. 4 patients) of the patients examined and a stability of the same values in the other 25% (n. 2 patients) Table; echocardiographic examination with normal EF values without episodes of heart failure. At 12 months, 85% of patients remain on therapy (1 suspended due to intolerance). The therapy was well tolerated and effective; general malaise and asthenia are reported in the vicinity of the therapy performed for a single patient.

N.	AGE	SPINAL FRACTURE	FEMORAL FRACT	REMS T0	REMS T 12 MONTHS	PREVIOUS THERAPIES
1	74	1		spinal -3 ; Femoral:-3.3	spinal:-2.6 ; Femoral:-3.0	ALENDRONATE
2	60	1		spinal: -2; Femoral.:-1	spinal: -0.9; Femoral:-0,2	ALENDRONATE
3	83	4		spinal:-3.3; Femoral:-3,4	spinal:-2.8; Femoral:-3,0	TERIPARATIDE,ALENDRONATE ,CLODRONATE
4	53	0		spinal: -2.9; Femoral:-2.8	spinal: -3.2; Femoral:-2.9	IBANDRONED
5	63	0	1	spinal.-0,6; Femoral.-1	spinal.-0.4; Femoral.-0.9	RESIDRONATO
6	69	0		spinal:-3; Femoral:-3	spinal:-2,7; Femoral:-3,9	ALENDRONATE , CLODRONATE

Conclusion: The data collected in the use of romosozumab in postmenopausal women suffering from osteoporosis at high risk of fracture, in our Marche case series, demonstrate an excellent maintenance rate and safety at twelve months. The data collected are limited by the small number of patients involved, but further morphological evaluations are planned to demonstrate the validity of this new therapy for osteoporosis.
References:

1. McClung MR, et al. N Engl J Med 2014;370:412
2. Saag KG, et al. N Engl J Med 2017;377:1417

P148
ASSOCIATION BETWEEN BODY MASS INDEX AND KNEE OSTEOARTHRITIS RADIOGRAPHIC STAGING IN ELDERLY PATIENTS

A. Fazaa[1], M. Rachdi[1], L. Ben Salem[2], S. Miladi[1], H. Boussaa[1], Y. Makhlouf[1], K. Ben Abdelghani[1], A. Laatar[1]

[1]Dept. of Rheumatology, Mongi Slim Hospital, [2]Family physician's office, La Marsa, Tunisia

Objective: Overweight is associated with higher mechanical load and exposure to systemic effects which could lead to cartilage damage. We aimed to assess the association between BMI and KOA grade based on Kellgren-Lawrence (K&L) criteria in elderly patients.
Methods: It's a cross-sectional study including patients aged $\geq$ 65 y, diagnosed with primary KOA according to the American College of Rheumatology criteria. Epidemioclinical data were gathered. BMI was calculated as weight in kilograms divided by squared height in meters. Based on the WHO's International classification, patients were placed into one of 3 BMI groups as follows: normal (18.5–24.9), overweight (25–29.9) and obese ($\geq$ 30). KOA grading was measured by K&L criteria from a conventional weight-bearing anteroposterior knee x-ray. Data analysis was performed using SPSS. The results were statistically significant if the p-value was < 0.05.
Results: 50 patients, 47 women (94%) and 3 men (6%) were enrolled. Mean age was 71.9 y [65–84]. All patients were retired. Their anterior professional activity was distributed as follows: 26 were housewives (52%), 5 had an office work (10%) and 19 had a physical labor (38%). Twenty-eight patients were married (56%), 20 were widower (40%) and two were divorced (4%). The most frequently noted comorbidities were high blood pressure (n = 42, 84%), diabetes (n = 15, 30%) and osteoporosis (n = 9, 28%). Mean disease duration was 98.4 $\pm$ 86.4 months [3–360]. Mean BMI was 29.9 $\pm$ 4.55 kg/m^2. 28 patients were obese (56%), 14 were overweight (28%) and 8 had normal BMI (16%). According to K&L criteria, mild (grade2) and moderate (grade3) KOA were observed in 24 (48%) and 26 (52%) patients respectively. In terms of gender, 12 women (25.5%) had a normal BMI, 13 (27%) were overweight and 22 (46.8%) were obese. All men were overweight and had a moderate KOA. A significant association between BMI and KOA grading was found (p = 0.01). In the normal BMI group, 6 patients (12%) had mild KOA and 2 (4%) had moderate KOA. However, in the overweight group, 10 (20%) patients had mild KOA while 4 (8%) had moderate KOA. In the obese group, 8 (16%) patients had mild KOA and 20 (52%) patients had moderate KOA. In patients with a BMI $\geq$ 25, statistically significant risk factor for KOA was age (OR = 1.15 [1.54–4.12], p = 0.04).
Conclusion: We found that a high BMI in associated with a more advanced radiological KOA. Therefore, improving BMI values toward normal in KOA older patients can help physicians have a better management of this common condition.

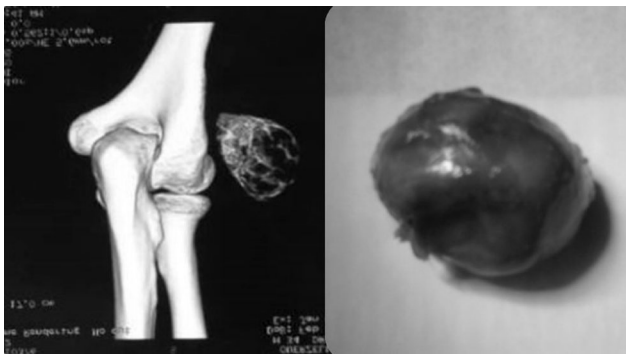
P149
A RARE CAUSE OF MYOSITIS OSSIFICANS: LOCALISATION AT THE ELBOW LEVEL

A. Fekih[1], J. Saadana[1], F. Chaouch[1], F. Boughattas[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Myositis ossificans is rare and essential to be aware of as the appearance of ossifications within soft tissues, in young patients, always raises the concern of a local neoplastic process.
Casereport: This was a 34-year-old patient who consulted for a swelling of the left elbow that appeared 7 months after an accidental

electrification. Examination revealed a swelling opposite the lateral condyle measuring 6 cm in diameter, with little pain and no limitation of mobility or sensorimotor deficit. The standard X-ray was normal, and a complementary CT scan was in favour of an ossifying myositis of the extensor carpi muscles at the elbow. A biopsy of the lesion confirmed the diagnosis. Enucleation of the tumour was performed without incident. At the last follow-up, the patient was asymptomatic with normal elbow function.



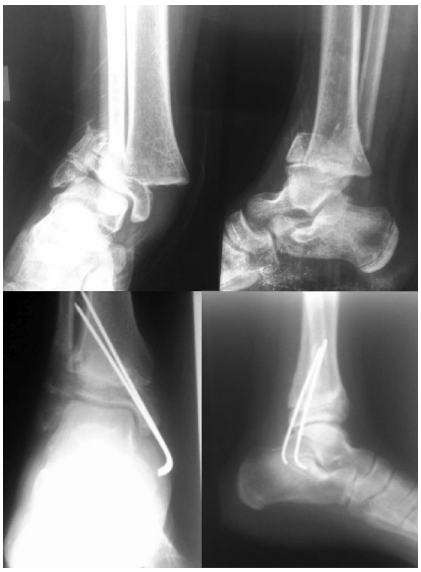
Discussion: The etiopathogenesis of myositis ossificans is unclear, but it appears that a focus of muscle necrosis or a haematoma may be the cause of the lesion. Electrification is a rare cause. The most common sites are the quadriceps and biceps brachii. The differential diagnosis is with infectious and sarcomatous lesions. The natural evolution is regression without sequelae, with sometimes persistence of an intramuscular ossified nucleus, more or less voluminous. Treatment is essentially medical. Surgery is only indicated in case of functional or mechanical limitations.
Conclusion: The problem with myositis ossificans is early diagnosis, as the clinical and radiological presentation may raise fears of a local malignant process. However, if there is any doubt, a biopsy is required.

P150
ATYPICAL PHYSEAL FRACTURE-SEPARATION OF THE LOWER END OF THE TIBIA IN CHILDREN: A CASE REPORT

A. Fekih[1], J. Saadana[1], F. Chaouch[1], H. Ratib[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Physeal fracture-separation of the lower end of the tibia and fibula are common in the paediatric population.
Casereport: A 12-year-old child was the victim of a sports accident resulting in a closed trauma of the right ankle. The radiological assessment concluded that the fracture was a physeal fracture-separation of the lower end of the tibia, type II according to the Salter and Harris classification on the front and side views, associated with a fracture of the lateral malleolus. Treatment consisted of external reduction followed by percutaneous pinning of the medial malleolus under fluoroscopic control. The result was satisfactory at 6 months with bone healing and correct ankle mobility.



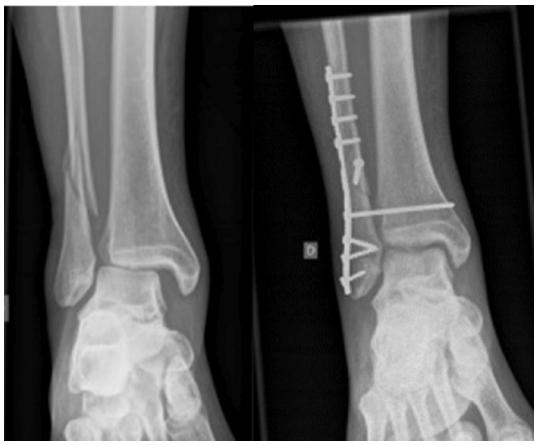
Discussion: Injuries to the conjugal plates of the ankle can affect the growth of the limb. The literature describes the Mac Farland fracture, the Tillaux fracture and the Triplane fracture. The fracture described here is not one of these types. Classically, type I and II lesions were treated orthopaedically, whereas type III and IV lesions are treated surgically, even percutaneously, provided that anatomical reduction is achieved and that attempts to pin the conjugal plate are reduced. Some authors have found no significant difference in the occurrence of misalignment between open surgery and percutaneous treatment.
Conclusion: Physeal fracture-separation of the lower end of the tibia require appropriate and effective treatment to prevent complications.

P151
BIMALLEOLAR EQUIVALENT FRACTURES: A SERIES OF 30 CASES

A. Fekih[1], J. Saadana[1], F. Chaouch[1], H. Belgacem[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Objective: The bimalleolar equivalent fracture is a fracture of the lateral malleolus in association with a medial osteo-ligament injury. It often goes unnoticed and requires adequate and rapid surgical management.
Methods: This is a retrospective study of 30 cases of bimalleolar equivalent fractures followed over a period of 7 y. The diagnosis was confirmed on radiographs of the ankle in front and in side by the Skinner test. Treatment was orthopaedic in minimally displaced or non-displaced fractures and surgical in displaced and off-center fractures by an external screwed plate more or less associated with screwing of the tibiofibular syndesmosis. We adopted Joy's scoring for assessing anatomical results and Vidal's radio-clinical scoring for assessing functional results.



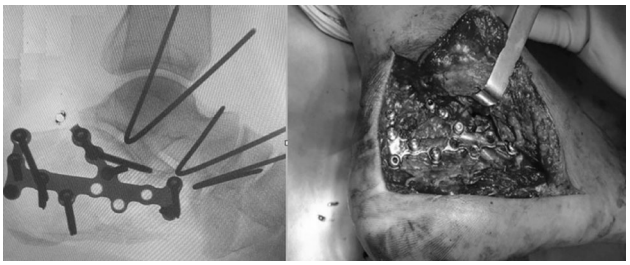
Results: The average follow-up was 3.5 y. Three fractures were open on the lateral side. Surgical treatment was indicated in 28 patients and orthopaedic treatment in the two remaining. Surgical treatment consisted of osteosynthesis of the lateral malleolus with a screw plate. In five cases, an internal approach was performed for ligament suture or reinsertion of a bone fragment. There were three early infectious complications; four delayed healing and five late complications (3 late sepsis, 1 post-traumatic arthritis and 1 malunion). The anatomical results were good in all cases. The functional outcome was good in 53.3% of cases and acceptable in 33.3%.
Conclusion: Bimalleolar equivalent fractures are uncommon in ankle traumatology; a well conducted treatment is the best guarantor of a good anatomical and functional outcome.

P152
CALCANEAL ARTICULAT FRACTURES: FUNCTIONAL VERSUS SURGICAL TREATMENT ABOUT A SERIES OF 80 CASES

A. Fekih[1], J. Saadana[1], F. Chaouch[1], A. Mdaoukhi[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Objective: Articular fractures of the calcaneus present a real therapeutic challenge with considerable functional and economic impact. The treatment continues to be at the heart of the controversy between conservative treatment and osteosynthesis.
Methods: This is a retrospective comparative study over a period of 11 y, including 43 cases of articular calcaneal fractures treated functionally, and 37 cases treated surgically. Functional (return to work, time to weight-bearing, KITAOKA score) and radiological (time to consolidation, Bohler angle at last follow-up, Kellgren–Lawrence subtalar osteoarthritis score, assessment of the hind foot axis) results were collected at last follow-up.



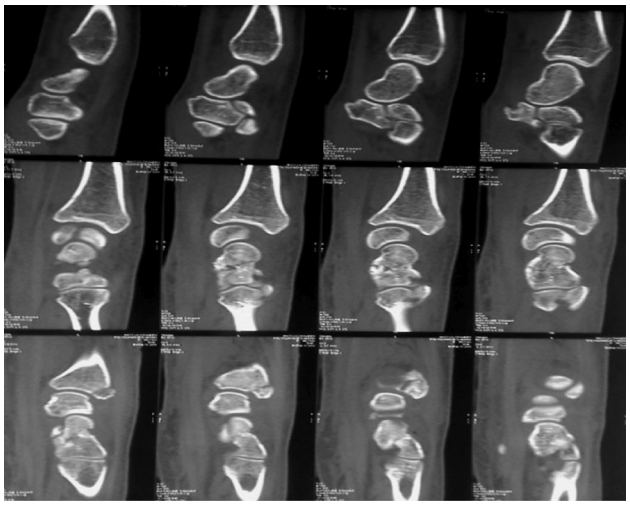
Results: The mean age was 36.5 y. Most fractures were classified as DUPARC V (41.3%). The mean initial Bohler angle was 14.3° in the functional treatment group vs. 11.4° in the surgical treatment group. Vertical sinking was the most frequent (52.5%). The KITAOKA score was comparable between the two groups, and the time to weight-bearing and return to work was shorter in the surgical group. Consolidation was achieved in all cases within an average of 12 weeks with no significant difference between the two groups. The mean Bohler angle at the last follow-up was 10.7° in the functional group vs. 21.7° in the surgical group. Subtalar osteoarthritis as assessed by Kellgren–Lawrence was more prevalent in functionally treated patients than in surgically treated patients.
Conclusion: We recommend surgical treatment whenever there is a zero or negative Bohler angle, varus of the greater tuberosity, mixed depression or external bone impingement.

P153
CONCURRENT FRACTURE OF THE TRIQUETRUM, CAPITATE BONE AND RADIAL EPIPHYSIS IN ADOLESCENTS: A CASE REPORT

A. Fekih[1], J. Saadana[1], F. Chaouch[1], A. Ltifi[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Fractures of the carpal bones with the exception of the scaphoid are much rarer. Despite a better knowledge of these lesions and the increasing improvement of imaging procedures, these fractures are still often discover and treat with delay.
Casereport: This is an 18-year-old female patient who presented with a closed left wrist injury following a fall in hyperflexion. Standard radiology and a CT scan of the wrist showed a horizontal fracture of the capitate, an oblique fracture of the triquetrum and a compound fracture of the radial epiphysis. Orthopaedic treatment with a plaster cast cuff holding the thumb for 6 weeks was indicate. The evolution was favourable. After removal of the cast, a rehabilitation protocol was instituted. At the last follow-up, the patient had regained proper function of her wrist with full mobility.



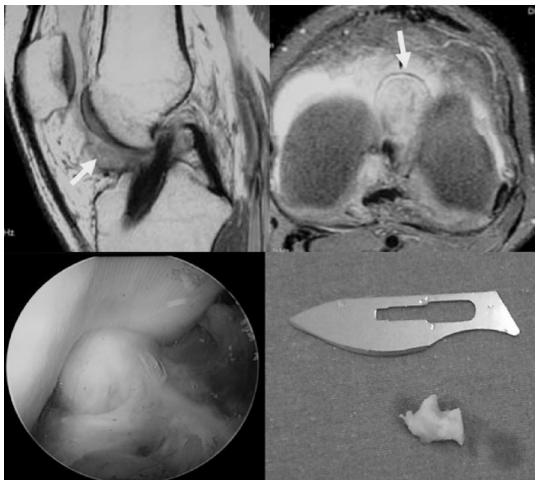
Discussion: Triquetrum fractures are the most common carpal fractures after scaphoid fractures. They are often associated with other lesions such as fractures of the lower end of the radius and especially perilunate dislocation of the carpus. Capitate bone fractures were found in 1.4% of all carpal bone fractures. The association of these two fractures is rarely described in the literature. Well-conducted orthopaedic treatment often gives good results. Among wrist fractures, if the scaphoid fracture remains the most frequent injury, other fractures are by no means exceptional.
Conclusion: It is important to know how to look for and diagnose these injuries early, as it is at this stage that treatment is the simplest and most effective.

P154
CYCLOPS SYNDROME AFTER ANTERIOR CRUCIATE LIGAMENTOPLASTY: A TWO-CASE REPORT

A. Fekih[1], J. Saadana[1], F. Chaouch[1], H. Haj Taieb[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Cyclops syndrome has been described as a loss of extension after anterior cruciate ligament (ACL) reconstruction due to proliferation of a fibrovascular nodule on the ACL graft.
Casereport: These were two patients operated on by ACL ligamentoplasty using a patellar tendon graft with simple postoperative recovery. Respectively at 4 and 6 months postoperatively, both patients recurred to gonalgia exacerbated by the extension of the knee. The diagnosis of suspected Cyclops syndrome was confirmed by MRI. Both patients were operated under arthroscopy. The graft had a good hold and the nodule was excised using the Shaver knife. At the last follow-up of one year, both patients were satisfied with full and painless knee mobility.



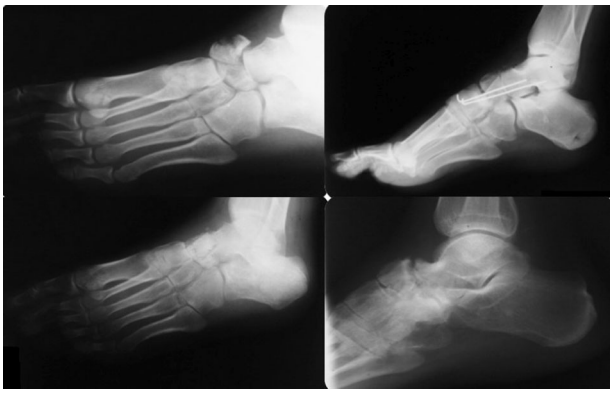
Discussion: Cyclops syndrome is a complication that can occur in up to 10% of patients who have undergone ACL ligamentoplasty. The onset of Cyclops syndrome can be early after ligamentoplasty, as early as the second month postoperatively. The pain is very characteristic and is provoked or aggravated by extending the knee. The diagnosis is essentially clinical and is confirmed by MRI. In the absence of a favourable spontaneous evolution, the treatment consists of arthroscopic debridement of the nodule. Sometimes a plasty of the intercondylar notch is necessary.
Conclusion: Cyclops syndrome is a complication of ACL ligamentoplasty, the origin of which is still controversial with a difficult calculation of the risk of occurrence. It represents an important factor of knee morbidity and the treatment consists of arthroscopic excision of the nodule.

P155
ENUCLEATION OF THE NAVICULAR BONE: A RARE LESION

A. Fekih[1], J. Saadana[1], F. Chaouch[1], A. Abbes[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

The severity of foot trauma varies greatly. Fracture-enucleation of the navicular bone is a very rare but serious entity requiring open reduction most often.
Casereport: This is a 25-year-old patient who consulted for a closed trauma of the left foot following a fall from a height of 3 m. X-ray followed by CT scan showed a comminuted fracture with dorsal enucleation of the navicular bone. The patient underwent emergency surgery with removal of the bone fragments and a bone graft was interposed with stabilisation by two pins. At two months postoperatively, the pins were removed after integration of the graft. At the last follow-up, the patient was asymptomatic with good mobility of the ankle.



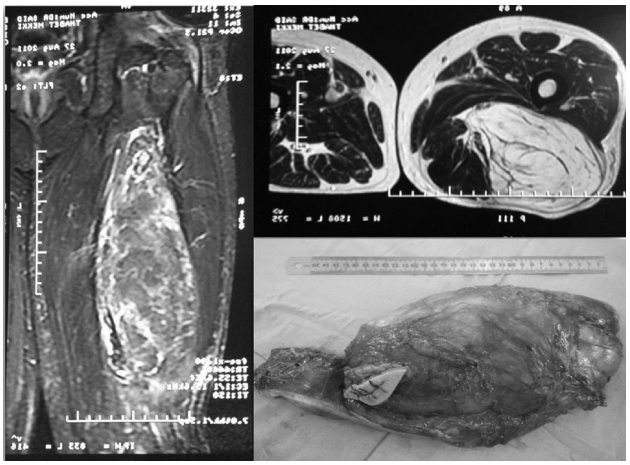
Discussion: Fracture-enucleation of the navicular bone is rare and results either from direct impact or indirectly from a fall on tiptoe resulting in crushing of the navicular bone between the head of the talus and the first cuneiform. A CT scan is necessary to better assess the injury. Treatment requires open reduction with screw fixation. Sometimes an immediate arthrodesis is indicate in case of significant comminution. The complications are bone necrosis and malunion. The evolution can be towards arthrosis or the appearance of a post-traumatic flat foot by collapse of the internal arch.
Conclusion: Enucleation of the navicular bone is a rare and serious lesion in functional terms. Talonavicular arthrodesis is the solution of choice provided that the length of the medial arch is preserved.

P156
GIANT LIPOSARCOMA OF THE THIGH: ABOUT TWO-CASE REPORT

A. Fekih[1], J. Saadana[1], F. Chaouch[1], F. Boughattas[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Soft tissue sarcomas are rare especially liposarcoma which account for one-fifth of them. We report two case of giant liposarcoma of the thigh treated surgically with good outcome.
Casereports: Case 1: This was a 48-year-old man who consulted for a swelling of the right thigh of progressive onset. MRI showed fatty invasion of the biceps femoris with a discrete mass effect on the surrounding structures without any sign of local aggressiveness.
Case 2: A 68-year-old woman consulted for a rapidly increasing swelling of the left thigh. MRI concluded that the tumor was lipomatous in nature with central necrosis in the adductor fossa. Surgical biopsy of both patients was in favour of a well differentiated liposarcoma. The extension assessment was negative; the procedure was to operate on both patients with a carcinological excision. At the last follow-up of one year, the patients were doing well with no recurrence or secondary localization.



Discussion: Liposarcoma is often located in the deep tissues of the limbs, particularly in the thighs. The diagnosis of certainty is made by surgical biopsy. Treatment is mainly surgical with wide or radical resection. Neo-adjuvant chemotherapy with or without radiotherapy is an effective procedure for conservative resection.
Conclusion: Liposarcoma of the limbs is a rare lesion. MRI is the reference examination for locoregional extension assessment and post-treatment follow-up. Biopsy and anatomopathological examination remain the keys to diagnosis and management is multidisciplinary.

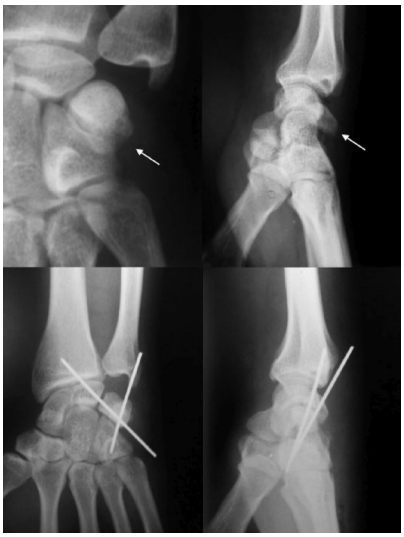
P157
ISOLATED FRACTURE OF THE TRIQUETRUM: ABOUT TWO CASES

A. Fekih[1], J. Saadana[1], F. Chaouch[1], H. Ratib[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Isolated triquetrum fracture is rare in carpal bone trauma. It may go unnoticed and sometimes requires CT scanning for diagnosis.
Casereports: Case 1: This is a 38-year-old patient who consulted for closed trauma of the right wrist following a fall from a height with landing on the palm of the hand. X-ray showed a nondisplaced triquetrum fracture. Orthopaedic treatment with a plaster cast was indicated for one month.
Case 2: A 26-year-old patient consulted with open trauma of the right wrist following a fall on a sharp object. X-ray showed a displaced triquetrum fracture. The patient underwent emergency surgery with cross pinning of the triquetrum.

The evolution was favourable with consolidation of the fracture and normal mobility of the wrist for the first patient. For the second patient, despite the consolidation of the fracture, he still has discomfort when mobilizing the wrist.



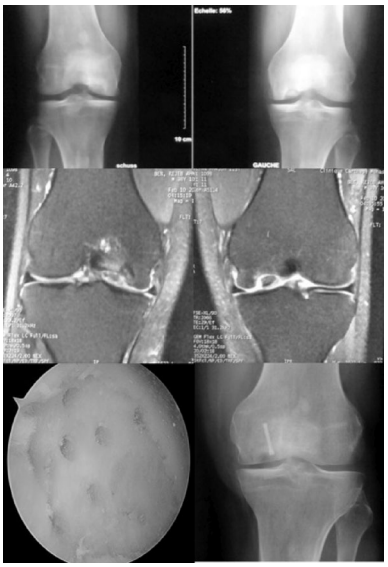
Discussion: Isolated triquetrum fracture is rarely encountered and is classified as a corporal and parcel fracture. It is deceptively benign and very often associated with a fracture of the lower end of the radius or another carpal bone. Clinically, there is painful swelling of the wrist with reduced mobility. A radiological assessment is necessary to confirm the diagnosis, sometimes aided by CT scan. Treatment is usually orthopaedic, and surgical in the case of a displaced fracture. The evolution is generally favourable however; cases of pseudarthrosis or osteonecrosis have been reported.
Conclusion: Isolated triquetrum fractures are rare. The earlier the diagnosis the better the prognosis.

P158
OSTEOCHONDRITIS DISSECANS OF THE MEDIAL FEMORAL CONDYLE: A CASE REPORT OF CONCOMITANT INVOLVEMENT OF BOTH KNEES

A. Fekih[1], J. Saadana[1], F. Chaouch[1], H. Belgacem[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Osteochondritis dissecans of the medial femoral condyle is a rare lesion even more so its bilaterality. We report a case of bilateral involvement in a young adult.
Casereport: This is a 35-year-old patient, a casual sportsman who consulted for bilateral gonalgia more accentuated on the right side. MRI showed osteochondritis dissecans of both medial femoral condyles in zone 2 on the frontal view and in intermediate zone C on the lateral view. According to Bedouelle's classification, the anatomopathological type of the lesion was type III in the left knee and type IV in the right knee. The patient was operated with screwing of the lesion on the left side and removal of the foreign body and Pridie perforations for the right side. At the last follow-up of two years, pain was significantly reduced with improvement in the mobility area of both knees.



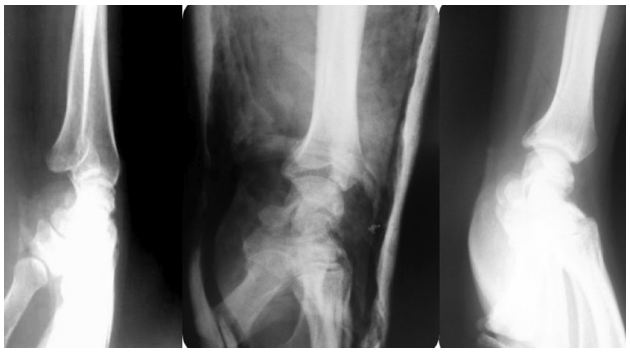
Discussion: Osteochondritis of the knee is often unilateral, but rare cases of bilateral involvement have been reported. The first step in treatment is to accurately assess the stage of injury. The reference examination is MRI. The therapeutic indications are based on the anatomo-radiological types (Bedouelle classification). The main therapeutic choices are orthopaedic treatment, perforations, refixing of the fragment, mosaicplasty and chondrocyte transplantation. The outcome depends on the type of the disease.
Conclusion: Although bilateral osteochondritis dissecans of the medial femoral condyle is a rare lesion, its management is the same as for unilateral involvement and it has benefited from new advances, notably chondrocyte transplantation.

P159
PALMAR DISLOCATION OF THE INFERIOR RADIO-ULNAR JOINT: A CASE REPORT AND LITERATURE REVIEW

A. Fekih[1], J. Saadana[1], F. Chaouch[1], A. Mdaoukhi[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Palmar dislocation of the inferior radioulnar joint is poorly reported in the literature due to the rarity of this lesion, which goes unnoticed in half of the cases.
Casereport: This is a 46-year-old female patient who consulted for wrist trauma with possible wrist flexion and extension and painful pronosupination block. Radiography had shown a palmar dislocation of the inferior radioulnar joint and a fracture of the ulnar styloid. The patient had a reduction followed by cast immobilisation for six weeks. At the last follow-up, there was good wrist mobility with a slight decrease in clamping force.



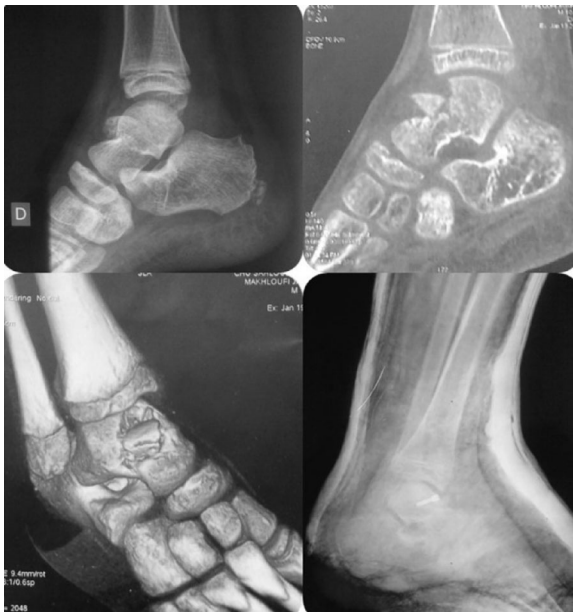
Discussion: Distal radioulnar joint dislocation is an often-late diagnosed injury, going unnoticed in 50% of cases. Clinical examination will find retained mobility in flexion and extension with a marked decrease in pronation amplitude in the case of palmar dislocation, or even a blockage. The frontal radiograph shows a distal radioulnar superposition and the side will show a displacement of the distal ulna. In contentious situations, comparative x-rays or a CT scan can confirm the diagnosis. The first step in treatment is reduction under general anaesthesia followed by cast immobilisation. Irreducibility indicates a late diagnosis or interposition of the triangular carpal ligament requiring surgical treatment with dislocation and fixation by radioulnar pinning.
Conclusion: Early diagnosis based on clinical and radiological findings improves the prognosis of orthopaedic treatment, surgery being reserved for failures of the orthopaedic treatment and for irreducible forms.

P160
PARCEL FRACTURE OF THE TALUS IN CHILDREN

A. Fekih[1], J. Saadana[1], F. Chaouch[1], A. Ltifi[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Parcel fractures of the talus in children are rare and usually result from violent trauma. The association with other foot and ankle injuries worsens the prognosis of these fractures, which must be managed early and appropriately.
Casereport: This was a 9-year-old child who had a fall from the stairs resulting in a closed right ankle injury. Examination found oedema over the anterior side of the tibio-talar joint and limited painful mobilisation of the ankle. X-ray and CT scan showed a patchy fracture of the articular surface of the talar trochlea. Treatment was surgical with open reduction and stabilisation with a mini screw driven under the cartilage. At the last follow-up, the fracture was consolidated with correct ankle mobility without discomfort to walking.



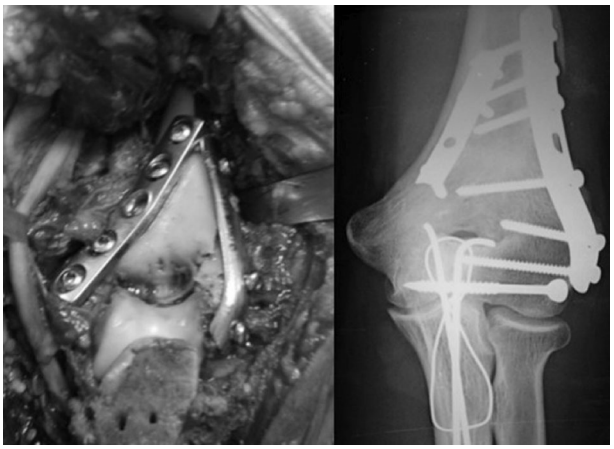
Discussion: Parcel fractures of the talar dome are most often osteochondral fractures. They should be investigated on radiographs and if necessary by CT scanning or MRI. Depending on the size and displacement of the fragment, treatment may be orthopaedic or surgical. A small fragment can be removed arthroscopically. If it is larger, it can be fixed by screw fixation.
Conclusion: Although talus fractures in children are rare, they are prone to complications that can be disabling. Their therapeutic management has clearly benefited from the progress of imaging and in particular CT scanning. The reduction must be as anatomical as possible to guarantee a better result.

P161
RESULTS OF SURGICAL TREATMENT OF SUPRA- AND INTRA-ARTICULAR FRACTURES OF THE DISTAL HUMERUS IN ADULTS: A SERIES OF 105 CASES

A. Fekih[1], J. Saadana[1], F. Chaouch[1], H. Haj Taieb[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Objective: Supra-and intra-articular fractures of the distal humerus are serious and complex injuries given the difficulty of management and the potential consequences that can affect the elbow.
Methods: This is a retrospective study of 105 patients operated on for supra- and intra-articular fractures of the distal humerus. The approach was posterior via a transolecranial approach. Osteosynthesis was performed by an external fixation plate associated with internal column osteosynthesis (plate, screwing).



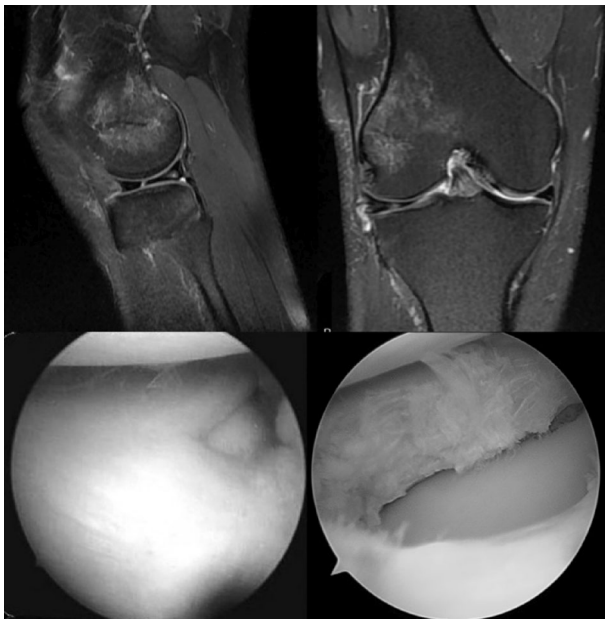
Results: Preoperatively, 26.6% of the fractures were simple classified as C1, 48.5%, had metaphyseal comminution classified as C2 and 24.9% had epiphyseal comminution classified as C3. 18 cases had a cutaneous opening. At the last follow-up, mean flexion was 120°, mean extension − 16°, mean pronation 82° and mean supination 73°. The mean MEPS score was 82.3 points. 36 cases had excellent results, 27 cases had good results, 19 cases had fair results and 23 cases had poor results. Five cases had postoperative infection, six patients had neurological complications mainly of the ulnar nerve, 10 cases had debricolage of the material, 49 cases had elbow stiffness, five cases had pseudoarthrosis of the focus and eight cases of the olecranon.
Conclusion: The prognosis of supra- and intra-articular fractures of the distal humerus in adult was considered very poor due to the frequent progression to elbow stiffness and osteoarthritis. Thanks to advances in osteosynthesis, the prognosis of these fractures has improved markedly, especially after the introduction of new implants that respect the anatomy of the humeral palette.

P162
THE LATERAL DISCOID MENISCUS: A TWO-CASE REPORT

A. Fekih[1], J. Saadana[1], F. Chaouch[1], A. Abbes[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Lateral discoid meniscus is the most common congenital meniscal anomaly. It is often discovered at a young age and is rarely diagnosed in adulthood.
Casereport: These two patients aged 26 and 45 years consulted for gonalgia with external meniscal syndrome. Standard radiographs were normal, so an MRI was ordered and showed a discoid lateral meniscus with a transverse tear in both cases. Arthroscopy was performed to confirm the diagnosis of discoid lateral meniscus, which was type I according to Watanabe's classification in both cases. A meniscoplasty was performed to restore the meniscus to a near-normal shape. At the last follow-up of one year, the complaints of both patients were significantly reduced with normal knee function.



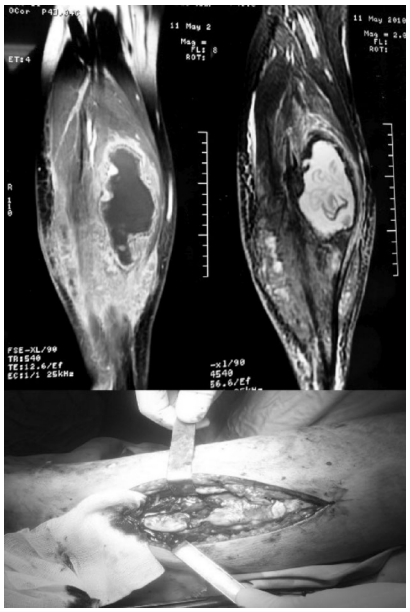
Discussion: The discoid meniscus is a meniscal malformation of variable frequency in the populations studied. It is usually external or lateral and can become symptomatic even if there is no associated lesion. Surgical intervention is then indicated and aims to restore physiology to the meniscus while removing any damaged areas. Maximum meniscal sparing must be the rule because of the deleterious long-term consequences on the cartilage of a total meniscectomy.
Conclusion: The main problem with a discoid meniscus is deciding when to operate. Indeed, the tendency in the case of a meniscus that is not very troublesome is often to wait. In the case of meniscus tears, conservative treatment by meniscoplasty is then indicated.

P163
THE MUSCULAR HYDATID CYST: A RARE LOCATION IN THE CALF

A. Fekih[1], J. Saadana[1], F. Chaouch[1], F. Boughattas[1], I. Aloui[1], I. Haddada[2], A. Abid[1]

[1]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, [2]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, Tunisia

Hydatidosis is secondary to the development in humans of the larval form of the dog taenia: Echinococcus granulosus. It mainly affects the liver and lung and exceptionally the soft tissues.
Casereport: This is a 22-year-old female patient who consulted for a painful swelling of the calf that had been evolving for 6 months without any notion of trauma. The radiograph was normal and the MRI showed two cystic masses in the posterior compartment of the left calf related to ruptured hydatid cysts. Chest X-ray and abdominal ultrasound were normal; the patient was operated on with an internal approach allowing total resection of the cysts. At the last follow-up, there was no local recurrence and hydatid serology was negative.



Discussion: The muscular location of hydatid cysts is rare even in endemic countries.
Clinically, there is a latency of expression of these cysts, which present as inert tumours, progressively increasing in volume. Ultrasound and CT scans help to orientate the diagnosis by showing a more or less heterogeneous liquid image with visualisation of daughter vesicles. Pericystectomy is the surgical method of choice, but it is sometimes difficult to perform, especially in the absence of cleavage planes, deep cysts or in contact with vascular and nerve elements.
Conclusion: Soft tissue hydatid cyst is a rare localization with slow development and local extension. It should be considered especially in subjects from an endemic area and the necessary investigations should be requested in order to make an early diagnosis and avoid therapeutic errors.

P164
DIFFERENTIAL DIAGNOSIS AND TREATMENT OF MYOTONIC AND MYOFASCIAL SYNDROMES OF NECK PAIN

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Objective: The dynamic monitoring of 195 patients with myotonic and myofacial syndromes of neck pain was done against the control group of 45 people.
Methods: MRI of cervical and vertebrocranial areas of spinal column, electromyography of 7 to 9 relevant muscles, finding of the "key" muscle and the overall computer aided assessment of osteomuscular, cardiorespiratory and oxygen transport system disorders.
Results: Clinical and electromyographic criteria for diagnosis of myotonic and myofascial syndromes of neck pain were identified based on the occurrence rates. The role of major system disorders in pathogenesis of neurological manifests of neck pain was studied. New therapeutic approaches to stopping pain and myotonic syndromes were developed; the effectiveness of early rehabilitation measures was demonstrated. The prevailing myotonic syndromes were identified which were the musculus obliquus capitis inferior syndrome (in 68, or 39.4% patients); superscapular area syndrome (33% of patients); musculus scalenus anterior and musculus scalenus medius syndromes (18.9%); musculus pectoralis minor syndrome (9.7%). Hypodynamia caused system disorders were noted in 78.3% patients including excessive body mass and fat content; reduced blood circulation rate and heartbeat volume and the pronounced decrease of PWC170. The most informative spondylographic findings were reduced thickness of posterior areas of intervertebral disks from CI to CVII (52.3 to 77.9% of patients), cervical lordosis impression (76.4%) and uncovertebral arthroses (58.2%).
Conclusion: The most seriously affected ("key") muscles in neck pain patients were found. Diagnosis and treatment strategies for neck pain patients were developed.

P165
TECHNICAL MEANS OF REHABILITATION FOR PATIENTS WITH LOW BACK PAIN

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Methods: 78 patients with myotonic syndrome. Patients went through the clinical estimation of neurologic status, manual testing of muscles, CT and MRI of back bone lumbar department, interferential and needle electromyography of the most damaged muscular groups, dosed loading veloergometry, revasography of feet, and shins.
Results: Medical-rehabilitation complex on damaged extremity was approbated in 27 patients with MT syndrome. The complex included oral reception of katadolon (100 mg 3 times a day for 10 d), tractions on Fintrac-471 table (with force from 3 to 55 kg, a course of 8–10 sessions) and also acupuncture with use acupuncture points of general action with vascular autonomic nervous system orientation (G14, MJ6, E36, RP6, TR5, V40) and locally segmented points on the most damaged muscular groups (AT60, VB30 with deep introduction to piriform muscle; VB 34, VB41, F3).
Conclusion: After treatment damaged extremity pain has completely disappeared in 19 patients, pain essentially decreased and increased tolerance of physical activity in 6 patients. It is established, that katadolon shows not only analgesic and neuroprotective, but also myorelaxing action on muscles of pelvic girdle and feet in patients with acute and chronic pain syndrome.

P166
DIFFERENTIAL DIAGNOSIS AND TREATMENT OF MYOTONIC AND MYOFASCIAL SYNDROMS OF NECK PAIN

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Methods: The dynamic monitoring of 195 patients with myotonic and myofacial syndromes of neck pain was done against the control group of 45 people. An extended neurological examination was carried out which included roentgenometry of cervical and vertebrocranial areas of spinal column, electromyography of 7 to 9 relevant muscles, finding of the "key" muscle and the overall computer aided assessment of osteomuscular, cardiorespiratory and oxygen transport system disorders.
Results: Clinical and electromyographic criteria for diagnosis of myotonic and myofascial syndromes of neck pain were identified based on the occurrence rates. The role of major system disorders in pathogenesis of neurological manifests of neck pain was studied. New therapeutic approaches to stopping pain and myotonic syndromes were developed; the effectiveness of early rehabilitation measures

was demonstrated. The prevailing myotonic syndromes were identified which were the musculus obliquus capitis inferior syndrome (in 68, or 39.4% patients); superscapular area syndrome (33% of patients); musculus scalenus anterior and musculus scalenus medius syndromes (18.9%); musculus pectoralis minor syndrome (9.7%). Hypodynamia caused system disorders were noted in 78.3% patients including excessive body mass and fat content; reduced blood circulation rate and heartbeat volume and the pronounced decrease of PWC170. The most informative spondylographic findings were reduced thickness of posterior areas of intervertebral disks from CI to CVII (52.3 to 77.9% of patients), cervical lordosis impression (76.4%) and uncovertebral arthroses (58.2%).

Conclusion: The most seriously affected ("key") muscles in neck pain patients were found. Diagnosis and treatment strategies for neck pain patients were developed.

P167
THE LONG TERM RESULTS OF TREATMENT AND REHABILITATION OF MULTIPLE SCLEROSIS PATIENTS

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Methods: Long term results of treatment of multiple sclerosis were studied. The dynamic monitoring of 110 patients over the period of 1–1.5 years following the successful in-hospital treatment of MS was carried out. Clinical methods, CT and MRI of cerebrum and spinal cord, and a patented radioimmunobiological assay of the myelinotoxic activity (MTA) of blood serum were used.

Results: Four groups of patients were distinguished: group 1 (36 patients; 32.7%) – patients with low MTA level (4.56 × 0.7 units) after successful hormone therapy. No rehabilitation was required out afterwards. Group 2 included 41 patients (37.3%) with low MTA level (3.76 × 0.81) after hormone and corrector therapy; a rehabilitation course was carried out at a later stage. Group 3 consisted of 22 patients (20.0%) that required long term immunomodulating therapy due to a higher rate of demyelinisation (MTA = 19.2 × 0.43). The remaining 11 patients (group 4, 10.0%) with moderate rate of demyelinisation (16.4 × 0.52) were prescribed general health improvement therapy and rehabilitation based on intensive motional activity and physical exercise.

Conclusion: Hormone therapy helps to reduce the demyelinisation rate to acceptable level within 2 to 4 month. The subsequent rehabilitation helps to achieve the extended remission period. However, long time after treatment of acute MS the hormone therapy is not justified.

P168
PATHOGENESIS OF COGNITIVE NEUROSIS-LIKE DISORDERS IN PATIENTS WITH INITIALLY CHRONIC VIRAL ENCEPHALITIS

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Methods: Brain MRI, research of cerebrospinal fluid and its dynamic, definition of a spectrum of 20 basic amino acids in blood serum and liquor.

Results: 126 patients with initial chronic viral encephalitis were surveyed. The most significant and informative appeared the decrease in free amino acids: serine (5.12 ± 0.15 mg/l; $P < 0.01$), glycine (6.59 ± 0.2 mg/l; $P < 0.001$), histidine (5.11 ± 0.12 mg/l; $P < 0.05$), alanine (12.93 ± 0.12 mg/l; $P < 0.001$), arginine (5.62 ± 0.09 mg/l; $P < 0.001$), tyrosine (5.08 ± 0.09 g/l; $P < 0.001$), meteonin (2.19 ± 0.12 mg/l; $P < 0.001$), phenylalanine (3.36 ± 0.14 mg/l; $P < 0.001$), lysine (6.94 ± 0.17 mg/l; $P < 0.001$), leucine (4.64 ± 0.14 mg/l; $P < 0.001$), threonine (6.2 ± 0.14 mg/l; $P < 0.001$), glutamic acids (2.99 ± 0.16 mg/l; $P < 0.001$) at simultaneous increase in concentration of tryptophan (7.36 ± 0.12 mg/l; $P < 0.001$). Among the connected amino acids in CMŽK the reliable increase, in comparison with control group healthy participants was observed, glycine (11.44 ± 0.13 mg/l; $P < 0.001$), histidine (6.12 ± 0.11 mg/l; $P < 0.001$), methionine (5.86 ± 0.07 mg/l; $P < 0.01$), lysine (19.42 ± 0.16 mg/l; $P < 0.001$), leucine (18.94 ± 0.14 g/l; $P < 0.01$), threonine (18.94 ± 0.14 g/l; $P < 0.001$), glutamic acids (9.69 ± 0.17 g/l; $P < 0.001$).

Conclusion: In pathogenesis of cognitive neurosis like disorders in patients with initial chronic viral encephalitis the great importance has the decrease in content of the majority free and bonded amino acids in cerebrospinal fluid and blood serum (alanine, glycine, glutamic acids, leucine, methionine, threonine, tryptophan, phenylalanine) at simultaneous increase of tryptophan, that it must be considered at carrying out of therapeutic actions.

P169
IMMUNOLOGICAL DISORDERS IN MULTIPLE SCLEROSIS PATIENTS WITH THE PRESENCE OF FOOD ALLERGY

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Objective: 102 multiple sclerosis patients 19–33 years old were examined against the control group of 20 healthy people.

Methods: MRI and immunological studies.

Results: All patients on the level of IgE in blood serum of 20 basic food products are divided into four groups: the first (13 pers, 12.7%) with the absence of IgE in serum, second (29 pers., 28.5%) with the presence of IgE (threshold 0.35–0.69 IU/ml); third (45 pers., 44.1%) with a moderate increase in IgE (0.70–3.49 IU/ml); fourth (15 pers., 14.7%) with a significant increase in IgE (3.50–17. 49 IU/ml) in serum. Patients first group without clinical signs of apparent exacerbation of MS were observed in blood eosinophilia, and the brain MRI revealed hyperintense foci in a single T-2W mode, indicating the absence of active demyelinating process. Patients with the second group with a slow chronic course of MS were determined by individual eosinophils (18.1%), indicating that they have a weak allergic reaction. Identification of individual hypo-and hyperintense lesions on brain MRI evidence of chronic course of demyelinating process in the presence of rare clinical exacerbations was seen by us as secondary progressive MS. In the third group investigated the apparent worsening of the process of clinical signs detected a moderate increase in serum IgE (45 pers., 44.1%) in the presence of explicit eosinophilia (11.8%).

Conclusion: Markers of exacerbation of MS is the simultaneous moderate increase in serum IgE eosinophilia, and the appearance of new lesions on MRI brain.

P170
REHABILITATION TECHNOLOGY OF PATIENTS WITH SYMPTOMATIC EPILEPSY

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Objective: 220 patients with symptomatic epilepsy were examined.
Methods: Neurological examination, MRI, EEG.
Results: Prepared technology rehabilitation of patients with symptomatic epilepsy caused by organic diseases of the central nervous system. The technology is intended for use by inpatient and outpatient offices rehabilitation, medical and rehabilitation expert committees, clinics, health resorts organizations in order to improve the outcome of the disease, prevent the development of disability or reduced the severity of violations, Disability formed under disability. The technology includes: selection of the object and the subject of rehabilitation of rehabilitation; expert-rehabilitation diagnostics; evaluation of rehabilitation potential, rehabilitation prognosis; medical examination (with evaluation categories and the degree of disability, the risk of disability); formation and practical implementation of individual rehabilitation programs; evaluation of the effectiveness rehabilitation and formation of further rehabilitation of the route.
Conclusion: With the formation of medical rehabilitation measures provided by the integrated use therapy, medical physical training, medication correction, physical therapy, dietetics, the organization "School of the patient."

P171
SOME ASPECTS OF REHABILITATION FOR PATIENTS WITH LOW BACK PAIN

A. Filipovich[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Objective: Examination of 78 patients with myotonic (MT) syndrome of lumbar osteochondrosis.
Methods: Patients went through the clinical estimation of neurologic status, manual testing of muscles, CT and MRI of back bone lumbar department, interferential and needle electromyography of the most damaged muscular groups, dosed loading veloergometry, revasography of feet, and shins.
Results: It was established for the first time, that among MT-syndrome patients 54 (69.2%) an associated damage of two or more muscles prevailed. The most damaged ("key") muscles appeared to be gastrocnemius muscle (43; 55.1%), gluteus medius (42; 53.82%), quadriceps femoris (36; 46.2%), rectus abdominis and external oblique (32; 41.1%), peroneal muscle (29; 37.2%), piriform muscle (29; 37.2%), lumbar quadrate muscle (28; 35.9%), gluteus maximus (19; 24.3%), gluteus minimus (16; 20.5%), adductor (14; 17.9%) and abductor (9; 11.5%) thigh muscles. Medical-rehabilitation complex on damaged extremity was approbated in 27 patients with MT syndrome. The complex included oral reception of katadolon (100 mg 3 times a day for 10 days), tractions on Fintrac-471 table (with force from 3 to 55 kg, a course of 8–10 sessions) and also acupuncture with use acupuncture points of general action with vascular autonomic nervous system orientation (G14, MJ6, E36, RP6, TR5, V40) and locally segmented points on the most damaged muscular groups (AT60, VB30 with deep introduction to piriform muscle; VB 34, VB41, F3).
Conclusion: After treatment damaged extremity pain has completely disappeared in 19 patients.

P172
THE AQUEOUS EXTRACT OF *PEPEROMIA PELLUCIDA* (L) KUNTH IMPROVES BONE HEALTH IN RATS RECEIVING A THERMO-OXIDIZED PALM OIL-SUGAR SUPPLEMENT

A. Florence Nadine[1], N. Florence[1], G. Raceline[1], D. Jean[1], F. Rodrigue[1], D. Paul[1], D. Théophile[1]

[1]Dept. of Animal biology and Physiology, Faculty of Science, Univ. of Yaoundé I, Yaoundé, Cameroon

Peperomia pellucida (L) Hunth est une plante utilisée en médecine traditionnelle camerounaise pour le traitement des fractures. L'étude a examiné l'effet de l'extrait aqueux de plante entière de *Peperomia pellucida* chez des rats fracturés nourris avec un régime supplémenté en huile de palme thermo-oxydée et saccharose. Des rats mâles Wistar adultes ont reçu un régime alimentaire standard ou un supplément thermo-oxydé d'huile de palme et de saccharose pendant 112 jours. Ils ont été traités avec de l'eau distillée ou *Peperomia pellucida* aqueuse (100 et 200 mg/kg). Après 14 jours de traitement, les animaux ont été sacrifiés sous anesthésie et l'effet de l'extrait aqueux a été évalué sur certains paramètres biochimiques du sérum, des os et de l'hématologie. L'histologie au site du fémur a été réalisée. La combinaison de la fracture avec un régime thermo-oxydé à base d'huile de palme et de saccharose a induit une augmentation du calcium fémoral, du phosphore sérique et osseux, de l'ALP fémorale et une diminution de l'ALP sérique. L'extrait aqueux administré simultanément à l'alimentation complétée par de l'huile de palme thermo-oxydée et du saccharose a amélioré tous ces paramètres observés avec un effet marqué à la dose de 200 m/kg. L'histologie du fémur fracturé a montré la présence d'une structure de callosité osseuse très proche de celle de la normale. *Peperomia pellucida* peut être utilisé pour fabriquer un médicament traditionnellement amélioré et également utilisé dans une étude clinique pour le traitement des fractures de fragilité. *L'extrait* aqueux de P. *pellucida* possède des propriétés ostéo-inductives capables d'accélérer la cicatrisation osseuse chez les rats nourris avec une alimentation complétée par de l'huile de palme thermo-oxydée-saccharose.

P173
CENTRAL OBESITY AND IT RELATIONSHIP BETWEEN SARCOPENIA AND BONE MINERAL DENSITY IN OLDER MEN

A. G. Diaz[1], R. A. Salazar Muñoz[1], S. Capalbo[1], E. A. Aguero Zarate[1], M. D. Dell'Aquila[1], Z. Orellana Villa[1], N. Woniatczuk[1], M. Poch[1], S. P. Lucas[1]

[1]Universidad de Buenos Aires, Endocrinology, Hospital de Clinicas "Jose de San Martin", Buenos Aires, Argentina

Objective: To analyze the impact of obesity on muscle mass and BMD in men > 50 of Buenos Aires.
Methods: We analyzed 281 men (66.4 ± 8.6 y) participating in a community activity at a University Hospital. Participants completed questions about osteoporotic risk, chronic diseases and medications. Evaluation included height, weight, waist circumference (WC), grip strength (HG) by dynamometry, the Short Physical Performance Battery Test (sppb), body composition and BMD in femoral neck (by Lunar). Obesity was defined by BMI $\geq$ 30 kg/m^2, percentage of body fat (%BF) $\geq$ 28% or WC $\geq$ 102 cm. Sarcopenia was determined according to EWGSOP2 (ALM/ht^2 $\leq$ 7 kg/m^2 and HG < 27 kg) or SDOC (HG < 35.5 kg and gait speed < 0.8 m/s).
Results: The prevalence of sarcopenia varied between EWGSOP2 (2%) and SDOC (3.2%) (p = 0,007), reaching 6% and 10%, respectively, for those 80 + . Physical performance, muscle mass and BMD

showed significant decline with age (Table 1). Similar obesity prevalence was observed according to both BMI (32.1%) and WC (38.1%), while it was higher by %BF (72.2%)($p < 0.0001$). ALM/ht^2 positively correlated with BMI ($r = 0{,}604$, $p < 0.0001$) and WC ($r = 0.435$, $p < 0.0001$). However, men with obesity by WC showed prolonged sit-chair test performance ($p = 0.002$) and reduced grip strength ($p = 0.04$). No difference was found in physical performance between obese and non-obese group based on BMI or %BF. BMD and T-score were higher in obese men ($p = 0.001$). ALM/ht^2 correlated with BMD ($r = 0.31$, $p < 0.0001$) and T-score ($r = 0.31$, $p < 0.0001$). However, individuals with osteoporosis presented lower ALM/ht^2 and poorer sppb test ($p = 0.035$).

Table 1.

Age (y)	Grip strength (kg)	Sit-chair (seg)	Walking speed (m/seg)	sppb	ALM/ht^2 (kg/m^2)	T-score	%BF	WC (cm)
50-59	41.5±0.9*	10.2±0,3*	0.48±0.1*	11.4±0.1*	8.4±1.3*	-0.5±0.1*	32.1±0,7	99.4±1.5
60-69	39.5±0,9	10,8±0,3	0.48±0.2	11.1±0,1	8.4±0.9	-0.6±0.1	31.1±0.6	98.6±1,2
70-79	35.8±0.7	11.5±0.4	0.56±0,1	10.9±0,1	8.0±0.1	-1.0±0.1	31.2±0.8	97.9±1.4
80+	31.6±1.6*	13.8±0.9*	0.62±0.2*	9.8±0.4*	7.8±0.2*	-1.3±0.2*	32.9±1.5	97.5±2.3
*p	0.0001	0.001	0.014	0.0001	0.005	0.009	NS	NS

Conclusion: Despite of association between skeletal muscle mass and fat mass, central obesity appears to impact physical performance. Implementing lifelong interventions to manage central obesity could be important in preventing sarcopenia.

P174
PILOT STUDY: VITAMIN D LEVELS AND DENGUE FEVER—IS THERE AN ASSOCIATION WITH PROGNOSIS?

A. G. Mumbach[1], J. M. Roganovich[1], M. Martinez[2], M. L. Garcia[3], M. Ferreyra[4], V. Ferreyra[4]

[1]ADENO-CEIEMP, Posadas-Misiones, [2]BIOMED, Posadas, [3]Santorio Dr. Julio Mendez, Ciudad Autónoma de Buenos Aires, [4]Sanatorio integral IOT, Posadas- Misiones, Argentina

Objective: Dengue virus (DENV) is an infection transmitted by the bite of Aedes mosquitoes. The disease severity is variable and depends on several factors. Some studies have correlated vitamin D (VD)status and DENV outcomes. The objective of our study is to know if low levels of VD impact on DENV prognosis.
Methods: A retrospective cohort study was carried out. Taking data patients who had positive antigens to DENV and at least one measurement of VD in the last 3–6 months. Patients were grouped into DENV without alarm signs, DENV with alarm signs and Severe DENV. The variables were tested with parametric or non-parametric tests according to their distribution. Simple linear, multivariate, and logistic regressions were performed that were adjusted for confounders (comorbidities, age)-Stata18.0 Software was used.
Results: 52 patients were recruited aged in 49 ± 17 years old. The vitamin D mean value was 31.6 ± 13 ng/ml. 46.2% had VD under 30 ng/ml. Patients with highest VD levels presented less sign or symptoms (without alarm) against those with lower levels ($p < 0.01$) Table 1. In patients with alarm signs and severe DENV, values of VD were 22.1 ± 8 ng/ml and 20.5 ± 13 ng/ml respectively. Patient with VD levels < 30 ng/ml presented an OR of 11.1 to have DENV with alarm ($p < 0.01$ CI 2.89–83).

Table 1.

	Without alarm DENV (n: 34) *1	With alarm DENV (n:13) *2	Severe DENV (n: 5) *3	*p*
Age (y)	46.7±16.3	50.4 ±17.5	63±17	0.08
Vitamin D (ng/ml)	36.9±11.5	22.15 ±8	20.5± 13	<0.01
Comorbidities (n)	10	4	4	0.06

Dunn test: P*1 vs*2: <0.01, *1 vs*3: 0.003. *2 vs. *3: 0.44

Conclusion: Considering that this is a pilot study in order to program a prospective cohort study with a better number of patients and improving quality of design and execution, the results showed above encourage us to keep in the track of our objective and presume a possible association between VD levels and DENV evolution and prognosis.

P175
VARIATIONS IN HOSPITAL LENGTH OF STAY AND PERFORMED SURGICAL PROCEDURES AFTER HIP FRACTURES

A. Gasparik[1], L. Lorenzovici[1], M. Cevei[2], D. M. Farcas[2], D. Stoicanescu[3]

[1]Univ. of Medicine and Pharmacy of Tg Mures (UMFST), Tirgu Mures, [2]Universitatea Oradea, Oradea, [3]Univ. of Medicine V Babes Timisoara, Timisoara, Romania

Objective: The number of days spent in hospital (LoS) for osteoporosis and consequent fractures is higher than for myocardial infarction, stroke, breast cancer and chronic obstructive pulmonary disease. While most hip fractures are treated surgically, the LoS as well as the procedures performed to repair the fracture vary widely depending on many factors. Our aim was to define the patient and hospital characteristics that impacts these output variables.
Methods: We performed a retrospective study including 5993 inpatients registered during the years of 2018–2019 in 7 Romanian counties, with femoral neck, pertrochanteric, and subtrochanteric fractures. The following variables were registered: demographic characteristics of the patients, diagnosis code, duration of hospital stay, therapeutic procedure, hospital category (clinical, county, municipal), county where the surgery was performed, and in-hospital death.
Results: Regression analysis was used to examine variations in duration of care, procedures performed and death while controlling for patients' gender, setting (urban/rural), diagnosis, hospital category and region. Average age was 77.2 y (86% 65+), mean length of hospital stay was 13.3 d (varied between 9.6-Vaslui and 14.6-Arad county). Urban residents and men spent significantly more days in the hospital (p.000 and.019). LoS was significantly longer also among older patients, in subtrochanteric fractures and *county* hospitals. The other analyzed dependent: the surgical procedure significantly correlated (when controlled for diagnosis 72.0, 72.1, 72,2 codes) with the following variables: urban vs. rural setting, diagnosis, type of hospital, age, length of care and in-stay death. Some of the variations observed are consistent with the international epidemiological data. Urbanity/rurality and gender dependence is noted in the literature for fracture incidence, LoS and mortality, however, no data was found for procedure choices based on patient gender and setting. The seemingly unexplainable variations raise the question of possible arbitrary (subjective/preferential) and professionally unjustifiable health technology choices.
Conclusion: Our study revealed that Los is significantly higher among men, urban residents and when hospitalized in a county unit. High variations are observed among fixation procedures depending on gender, setting, and hospital category. Exploring these complex patterns, the causes of the variations, solutions might be identified for optimal medical choices, reduction of prolonged care and a better resource allocation.

P176
FRACTURE RISK IN A PATIENT WITH OSTEOPOROSIS AND MULTIPLE RISK FACTORS

A. Gherle[1], M. Cevei[1], D. Stoicanescu[2], M. S. Deac[1]

[1]Univ. of Oradea, Faculty of Medicine, Oradea, [2]Univ. of Medicine and Pharmacy "Victor Babes", Timisoara, Romania

Osteoporosis prevalence is significantly higher in patients who had hysterectomy with removal of ovaries. We present the case of a 61-year-old female patient who was diagnosed with postmenopausal osteoporosis after total hysterectomy with bilateral anexectomy for severe cervical dysplasia at 45 years. Her personal medical history revealed Hashimoto's autoimmune thyroiditis, hypothyroidism, normocalcemic hyperparathyroidism, C1-C2 and C3 cervical myelitis (Sylvian aqueduct stenosis from 2012). She was hospitalized for motor deficit, paraparetic type, balance difficulties, paresthesia in the lower limbs, and slight deficit in performing ADLs. The physical examination showed positive evidence of paresis in the lower limbs, slight spasticity-Ashworth 1. DXA performed in March 2021 revealed lumbar spine T-score: − 3.2; left hip T-score: − 1.4; right hip T-score: − 1.8. DXA from January 2023 showed lumbar spine T-score: − 3.3 left hip T-score: − 2.1 right hip T-score: − 2.3. 10 m walk test at admission: average steps 18.75; average time duration 12.65 s; step length 0.16 m; speed 0.79 m/s. 10 m walking test at discharge revealed: average steps 18.25; average time duration 11.98 s; step length 0.54 m; speed 0.74 m/s. Final 10 m walk test with drop-foot orthosis: average steps 16.5; average time duration 10.67 s; step length 0.6 m; speed 0.93 m/s. Grip strength measured with Jamar dynamometer showed left handgrip strength 10.5 kg and right handgrip strength 10.67 kg. The evolution under complex recovery treatment focused on individual physical therapy, occupational therapy and virtual reality-D-wall biofeedback, proprioceptive modulation therapy was favorable. The FRAX score revealed the ten year probability of major osteoporotic fracture was 37 and of hip fracture 6.4, a very high risk, the patient requiring immediate therapeutic interventions.

P177
THE IMPORTANCE OF ORAL HYGIENE: DOES PRIOR DENTAL IMPLANT PLACEMENT OR DENTAL CARIES WITHIN 1 YEAR OF PRIMARY TOTAL KNEE ARTHROPLASTY INCREASE MEDICAL COMPLICATIONS AND PERIPROSTHETIC JOINT INFECTIONS?

A. Gordon[1], R. Vakharia[1], M. Mont[2]

[1]Maimonides Medical Center, Brooklyn, [2]Rubin Institute of Advanced Orthopedics, Baltimore, USA

Objective: One of the leading causes of total knee arthroplasty (TKA) failure and reoperation includes periprosthetic joint infection (PJI). Historically, poor dental health and dental pathology have been considered a risk factor for development of PJIs. With few large comparative studies, there is a lack of consensus among orthopaedic surgeons and dentists regarding the influence of prior dental history and need for antibiotic prophylaxis in primary total knee arthroplasty (TKA) patients. Therefore, the objectives were to determine the association of dental caries or dental implant placement prior to TKA on: (1) medical complications; (2) healthcare utilization including lengths of stay (LOS) and readmission rates; and (3) implant-related complications including PJIs and healthcare expenditures.
Methods: A retrospective analysis was performed using a nationwide insurance claims database for primary TKAs from 2010 to 2020. Patients and complications were identified using International Classification of Disease, Ninth/Tenth Revision (ICD-9/10) and Current Procedural Terminology (CPT) codes. Patients undergoing primary TKA with a history of dental caries or dental implant placement within 1 year of TKA represented the study group (n = 1466). Patients without prior history of dental implant placement or caries represented the comparison cohort (n = 7328). Study group patients were case-matched in a 1:5 ratio by age and comorbidities. Primary outcomes of the study were to compare 90-day medical complications, healthcare utilization parameters (LOS, readmission rates), 2-year implant-related complications, and healthcare expenditures. Pearson's chi-square analyses were used to compare patient demographics of the two cohorts. Welch's t-tests were used to compare LOS and costs. Multivariate logistic regression models were used to calculate odds (OR) and 95% CIs of developing medical complications and being readmitted within 90-days following TKA adjusting for age, sex, geographic region, and matched comorbidities. Following a Bonferroni-correction, a p-value less than 0.005 was considered statistically significant.
Results: Patients with a history of dental implant placement or dental caries within 12 months of primary TKA had higher frequency of medical complications compared to case-matched patients (20.05 vs. 13.11%; OR: 1.66, $p < 0.0001$), including myocardial infarctions (2.52 vs. 1.23%; OR:2.08, $p = 0.0002$) and pneumoniae (2.52 vs. 1.24%; OR:2.06, $p = 0.0002$). LOS (3.28 vs. 2.98 d; $p = 0.255$), readmission rates (4.71 vs. 4.28%; $p = 0.470$), and incidence of PJIs within 2 years of surgery (3.14 vs. 2.63%; OR: 1.20, $p = 0.279$) were similar between groups. Within the 90-day episode of care interval, healthcare expenditures were significantly higher in patients with recent dental history ($19,363 vs. 17,980; $p < 0.001$).
Conclusion: Patients with dental caries or dental implant placement have higher 90-day medical complications, greater healthcare expenditures, and similar 2-year implant-related complications. Poor dental hygiene did not lead to increased implant infections, however this comorbidity may be reflective of overall poorer medical condition in these patients resulting in greater postoperative complications and increased healthcare expenditures. Addressing dental history in the preoperative period may assist orthopaedic arthroplasty surgeons in minimizing complications in this group of patients.

P178
THE ASSOCIATION OF PRIOR DENTAL PATHOLOGY ON MEDICAL COMPLICATIONS AND PERI-PROSTHETIC JOINT INFECTIONS FOLLOWING PRIMARY TOTAL HIP ARTHROPLASTY: A RETROSPECTIVE MATCHED-CONTROL ANALYSIS

A. Gordon[1], R. Vakharia[1], M. Mont[2]

[1]Maimonides Medical Center, Brooklyn, [2]Rubin Institute of Advanced Orthopedics, Baltimore, USA

Objective: One of the leading causes of THA failure and reoperation includes periprosthetic joint infection (PJI). Historically, poor dental health and dental pathology have been considered a risk factor for development of PJIs. With few large comparative studies, there is a lack of consensus among dentists and orthopaedic surgeons regarding the influence of prior dental implant placement or dental caries and need for antibiotic prophylaxis in total hip arthroplasty (THA) patients. Therefore, the objectives of this study were to determine the association of pertinent dental history (dental implant placement or caries) prior to THA on: 1) medical complications, 2) lengths of stay (LOS), 3) readmission rates, and 4) implant-related complications including PJIs.
Methods: A retrospective query was performed using a nationwide administrative claims database for primary THAs from 2010 to 2020. Patients and complications were identified using International Classification of Disease, Ninth Revision (ICD-9) and Current Procedural

Terminology (CPT) codes. Patients undergoing primary THA with a history of dental caries or dental implant placement before THA represented the study group (n = 3620). Patients without documented dental history including implants or caries represented the comparison cohort (n = 18,084). Study group patients were case-matched in a 1:5 ratio by age and comorbidities. Primary endpoints of the study were to compare patient demographics, 90-day medical complications, in-hospital lengths of stay, 90-day readmissions, in addition to 2-year implant-related complications. Pearson's chi-square analyses were used to compare patient demographics of the two cohorts. Welch's t-tests were used to compare LOS. Multivariate logistic regression models were used to calculate odds (OR) and 95% CIs of developing medical complications and being readmitted within 90-days following THA adjusting for age, sex, geographic region, and matched comorbidities. Following a Bonferroni-correction, a p-value less than 0.001 was considered statistically significant.

Results: Patients with a history of dental implant or dental caries had higher frequency and odds of medical complications compared to case-matched patients without a prior dental history (27.76 vs. 16.79%; OR: 1.88, $p < 0.0001$), including cerebrovascular accidents (1.19 vs. 0.41%; OR: 2.96, $p < 0.0001$), deep venous thromboses (1.22 vs. 0.47%; OR: 2.61, $p < 0.0001$), pneumonias (4.00 vs. 1.80%; OR: 2.29, $p < 0.0001$), and acute kidney injuries (4.64 vs. 2.17%; OR: 2.22, $p < 0.0001$). Lengths of stay (3.15 vs. 2.90 days; $p = 0.073$), readmission rates (8.31 vs. 7.96%; $p = 0.491$), and incidence of PJIs within 2 y of the index procedure (3.65 vs. 3.28%; OR: 1.11, $p = 0.271$) were similar between groups.

Conclusion: Patients with a dental implant placement or history of dental caries prior to primary total hip arthroplasty have higher 90-day medical complications but similar 2-year implant-related complications including PJIs. In-hospital LOS and 90-day readmission rates were similar between the two cohorts. These findings may help surgeons further understand and risk stratify patients with a pertinent dental history undergoing THA.

P179
THE EFFECT OF COVID-19 ON ELECTIVE TOTAL KNEE ARTHROPLASTY UTILIZATION, PATIENT COMORBIDITY BURDEN, AND COMPLICATIONS IN THE USA: A NATIONWIDE ANALYSIS

A. Gordon[1], R. Vakharia[1], M. Mont[2]

[1]Maimonides Medical Center, Brooklyn, [2]Rubin Institute of Advanced Orthopedics, Baltimore, USA

Objective: Total hip (THA) and knee arthroplasty (TKA) are two of the highest-volume elective surgeries performed in hospitals in the USA. Elective surgery was suspended as a result of the COVID-19 pandemic beginning in March 2020. The projected backlog of cases was estimated to take between 9 to 35 months to recover. Equally as concerning, delays for a total joint replacement doubled during the pandemic, ultimately diminishing the quality of life in these patients. As a result of the suspension of elective total joint arthroplasty and the lack of nationwide reporting utilizing a representative cohort, the primary purpose of the current study is to: (1) compare temporal trends in case volume of elective total knee arthroplasty (TKA) from 2019 (prepandemic) to 2020 in the USA, and (2) compare patient demographics and postoperative complications of those undergoing TKA before and after the pandemic origin.

Methods: Utilizing a multicenter, nationwide representative sample, a retrospective query of the 2019 to 2020 ACS-NSQIP database was conducted for patients undergoing elective TKA (Current Procedural Terminology code 27447). Nonelective and revision TKA cases were excluded. Cases involving polytrauma or infections were excluded by using International Classification of Diseases, 9 or 10 Revision codes. The primary outcome was to compare the annual case volume from 2019 to 2020. Secondarily, we compared admission quarters to understand the impact of the COVID-19 pandemic restrictions on TKA utilization over time. As admission quarter 1 (Q1) ends March 31, temporal trends in utilization, demographics, and lengths of stay (LOS) were compared pre-COVID (2019 to 2020Q1) with post-COVID (2020Q2-Q4). Demographics included age, gender, race, and comorbidity burden. Postoperative 30-day complications, mortality, and readmissions were compared by calendar year (2019 vs. 2020). To assess for significant differences in patient demographics between years and admission quarters, Pearson chi-square tests, student's T test, and analysis of variance (ANOVA) were used. Linear regression was used to evaluate changes in procedural volume over time. A significance threshold of $p < 0.05$ was used.

Results: A total of 121,415 patients underwent elective TKA in 2019 (N = 72,002) and 2020 (N = 49,413), a 31.4% decline. Patient demographics of all patients undergoing surgery in 2019 vs. 2020 calendar year were similar with respect to BMI, functional health status, ASA Class, and the presence of the following comorbidities (tobacco use, heart failure). The proportion of hospital-defined 'outpatient' TKAs in 2020 was significantly greater than 2019 (41.5 vs. 25.5%; $p < 0.001$). Elective TKA utilization declined by 65.1% in 2020Q2 and never returned to pre-pandemic baseline in 2020Q3-Q4. The average LOS was shorter in 2020 (1.56 vs. 1.87 days; $p < 0.001$). The proportion of same day discharge increased by quarter from 2019Q1–Q4 (6.2% to 8.6%) to 2020Q1–Q4 (8.7% to 17.1%). Total complication rates were similar in 2019 (4.84%) vs. 2020 (4.75%); $p = 0.430$. The incidence of major complications (3.1 vs. 3.0%; $p = 0.413$), infection complications (1.4 vs. 1.5%; $p = 0.422$), cardiac complications (0.24 vs. 0.27%; $p = 0.286$), pulmonary complications (0.66 vs. 0.61%; $p = 0.284$), hematology complications (1.4 vs. 1.3%; $p = 0.055$), renal complications (0.11 vs. 0.09%; $p = 0.297$), and Clavien Dindo IV complications (0.65 vs. 0.65%; $p = 0.959$) were similar. Only wound complications (0.20 vs. 0.29%; $p = 0.004$) were significantly higher during the pandemic year. The 30-day mortality (0.08 vs. 0.07%; $p = 0.858$), reoperation (1.0 vs. 1.0%;$p = 0.940$) and readmission (2.8 vs. 2.6%; $p = 0.053$) rates were no different between 2019 and 2020.

Conclusion: In the USA, there was a 31.4% decline elective TKA in 2020. Case volumes precipitously declined by 65.1% during the second quarter of 2020, before eventually leveling off at 80% of pre-pandemic baseline. Patient demographics of those undergoing elective TKA in 2020 were younger and less frail. There was a 1.5-fold increase in the number of surgeries performed in the outpatient setting in 2020 with rates of same day discharge doubling over the study period. Overall 30-day complication, readmission, reoperation, and mortality rates were not increased during Covid-19. Orthopedic surgeons may use this study to counsel patients about having surgery during COVID-19.

P180
THE INFLUENCE OF PRIOR DENTAL PATHOLOGY ON MEDICAL COMPLICATIONS AND PERIPROSTHETIC JOINT INFECTIONS FOLLOWING PRIMARY SHOULDER ARTHROPLASTY

A. Gordon[1], R. Vakharia[1], J. Choueka[1]

[1]Maimonides Medical Center, Brooklyn, USA

Objective: One of the leading causes of anatomic and reverse shoulder arthroplasty failure and reoperation includes periprosthetic joint infection (PJI). Historically, poor dental health and dental pathology have been considered risk factors for developing infections. Antibiotic prophylaxis before invasive dental procedures is a common practice in the USA. However, consensus regarding the influence of

prior dental pathology (DP) on postoperative complications in orthopaedic surgical patients, and specifically shoulder arthroplasty patients is lacking. The objectives of this study are to determine the association of DP prior to shoulder arthroplasty (SA) on: (1) medical complications, (2) lengths of stay (LOS), (3) readmissions, (4) implant-related complications including PJIs, and (5) healthcare expenditures.

Methods: Using a nationwide administrative claims database, we queried all patients undergoing primary shoulder arthroplasty from 2010–2020. Patients and complications were identified using International Classification of Disease, Ninth/Tenth Revision (ICD-9/10) and Current Procedural Terminology (CPT) coding. Patients with history of dental caries or dental implant placement prior to SA represented the study group (n = 1419). Patients without prior DP represented controls (n = 7062). Study group patients were 1:5 ratio matched to controls by age, sex, and comorbidities. The comorbidities chosen for matching were those that have been found to be prevalent among upper extremity arthroplasty patients. Outcomes assessed included 90-day complications, readmissions, LOS, 2-year implant-related complications, and healthcare reimbursements. Pearson's chi-square analyses were used to compare patient demographics of the two cohorts. Welch's t-tests were used to compare LOS and costs. Multivariable logistic regression models were used to calculate odds ratios (OR) of complications and readmissions while adjusting for age, sex, geographic region, and matched comorbidities. A p value < 0.003 was significant.

Results: Patients with DP had higher odds of 90-day medical complications compared to controls (OR: 1.74, $p < 0.0001$), including myocardial infarctions (2.2 vs. 0.8%; OR: 2.79, $p < 0.0001$), acute kidney injuries (8.3 vs. 4.6%; OR: 1.92, $p < 0.0001$), and pneumonias (8.7 vs. 5.3%; OR: 1.72, $p < 0.0001$. Readmission rates (1.97 vs. 1.54%; $p = 0.248$) and LOS (2.17 vs. 2.07 d; $p = 0.071$) were similar between groups. Overall 2-y implant-related complications were higher in patients with DP compared to controls (16.1 vs. 11.5%; OR: 1.38, $p = 0.0003$), including dislocations (6.4 vs. 4.5%; OR: 1.45, $p = 0.002$) and mechanical loosening (4.0 vs. 2.4%; OR: 1.67, $p = 0.001$), however PJIs were similar (2.2 vs. 1.9%; OR: 1.12, $p = 0.583$). Within the 90-day episode of care interval, healthcare expenditures were not significantly different in patients with recent history of dental work ($12,611 vs. 12,059; $p = 0.075$).

Conclusion: Patients with prior DP have higher 90-day medical complications and 2-year implant-related complications. Two-year incidence of PJIs were similar between groups. These findings can be helpful for shoulder surgeons as they counsel and risk stratify patients with a pertinent dental history.

P181
PRIOR KIDNEY STENT PLACEMENT IS ASSOCIATED WITH INCREASED MEDICAL COMPLICATIONS, READMISSIONS, IMPLANT-RELATED COMPLICATIONS, AND COSTS OF CARE FOLLOWING PRIMARY TOTAL KNEE ARTHROPLASTY

A. Gordon[1], R. Vakharia[1], M. Mont[2]

[1]Maimonides Medical Center, Brooklyn, [2]Rubin Institute of Advanced Orthopedics, Baltimore, USA

Objective: In the USA, approximately 100,000 ureteral stents are placed annually to manage upper urinary tract obstructions caused by urolithiasis and other genitourinary pathologies. These may be left in place for weeks, months, or even years and are a nidus for infectious complications. Infections following total joint replacements are costly for the healthcare system. Total joint arthroplasty surgeons are cognizant of reducing periprosthetic joint infections in patients with prior risk factors. A recent proposed risk factor for seeding non-native joints involves pathology from the urinary system, however the influence of prior ureteral stent placement has not been investigated. Therefore, the objectives of this study were to determine the association of a prior history of kidney stent placement prior to TKA on: (1) medical complications, (2) lengths of stay (LOS), (3) readmission rates, (4) implant-related complications including PJIs, and (5) healthcare expenditures.

Methods: A retrospective case–control study was performed using a private insurance claims database for primary TKAs from 2010 to 2020. Patients and complications were identified using International Classification of Disease, Ninth/Tenth Revision (ICD-9/10) and Current Procedural Terminology (CPT) codes. Patients undergoing primary TKA with a history of prior kidney stent placement represented the study group (n = 25,419). Patients without prior kidney stent placement represented controls (n = 127,080). Study group patients were 1:5 ratio matched to controls by age, gender, and comorbidities. Primary endpoints of the study were to compare patient demographics, in-hospital lengths of stay, 90-day medical complications, 90-day readmissions, 2-year implant-related complications, and healthcare expenditures. Pearson's chi-square analyses were used to compare patient demographics of the two cohorts. Welch's t-tests were used to compare LOS and costs. A multivariate logistic regression model was used to calculate odds (OR) and 95% CIs of developing medical complications and being readmitted within 90-days following TKA adjusting for age, sex, geographic region, and matched comorbidities. Following a Bonferroni-correction, a p value less than 0.001 was considered statistically significant.

Results: Patients with history of kidney stent placement had a four-fold higher frequency of 90-day medical complications compared to controls (43.93 vs. 11.25%; OR: 6.18, $p < 0.0001$), including myocardial infarctions (3.92 vs. 1.37%; OR:2.94, $p < 0.0001$), pneumoniae (3.78 vs. 1.28%; OR:3.03, $p < 0.0001$), venous thromboemboli (2.53 vs. 1.14%; OR:2.24, $p < 0.0001$), cerebrovascular accidents (1.01 vs. 0.39%; OR:2.60, $p < 0.0001$), and surgical site infections (1.70 vs. 1.14%; OR:1.50, $p < 0.0001$). LOS (3.2 vs. 2.9 days; $p = 0.213$) was similar between groups, however 90-day readmission rates (4.39 vs. 3.50%; $p < 0.0001$) were significantly higher for patients with prior kidney stent history. Overall 2-year implant-related complications (5.13 vs. 3.76%; OR: 1.38, $p < 0.0001$) and PJIs (2.62 vs. 2.19%; OR: 1.20, $p < 0.0001$) were higher in patients with a history of kidney stents. Within the 90-day episode of care interval, healthcare expenditures were significantly higher in patients with prior history of kidney stents ($17,391 vs. 15,985; $p < 0.001$).

Conclusion: Patients with a kidney stent placement prior to TKA have higher 90-day medical complications, increased 2-year implant-related complications, and greater healthcare expenditures. These findings may help surgeons risk stratify patients with a pertinent invasive urological history.

P182
DEPRESSION SCREENING WITHIN 3 MONTHS OF SHOULDER ARTHROPLASTY DECREASES MEDICAL COMPLICATIONS, HEALTHCARE EXPENDITURES, AND IMPLANT COMPLICATIONS IN PATIENTS WITH DEPRESSIVE DISORDER: A RETROSPECTIVE MATCHED-CONTROL ANALYSIS

A. Gordon[1], R. Vakharia[1], J. Choueka[1]

[1]Maimonides Medical Center, Brooklyn, USA

Objective: Depression is a multifactorial disease that affects 322 million people worldwide and is projected to be the highest cause of disability by 2040. Depression has been shown to be a risk factor for postoperative medical complications, readmissions, and increased healthcare utilization in orthopaedic surgery patients. There is no

reported optimal timing and interval for screening patients with depressive disorder. Therefore, we evaluated depressive disorder patients to determine if having a formal depression screen within 90 days of shoulder arthroplasty would influence postoperative outcomes. The aims were to compare depressive disorder patients with and without formal depression screening prior to shoulder arthroplasty (SA) and the influence on: (1) medical complications, (2) lengths of stay (LOS), (3) readmission rates, (4) implant-related complications including PJIs and (5) healthcare expenditures.

Methods: A retrospective query was performed using a nationwide administrative claims database for primary shoulder arthroplasty (anatomic and reverse) from 2010 to 2020. Patients and complications were identified using International Classification of Disease, Ninth Revision (ICD-9) and Current Procedural Terminology (CPT) codes. Patients undergoing primary shoulder (SA) arthroplasty with a history of depressive disorder were the population of interest. These patients were subsequently filtered by those who had a formal depression screen within 90 d of their procedure (n = 3566) vs. those who did not (n = 17,769). Patients with screening were 1:5 ratio matched to patients without formal screening by age, sex, anxiety disorder, COPD, Diabetes, Hypertension, Obesity, and Tobacco use. Primary outcomes of the study were to compare 90-day medical complications, lengths of stay (LOS), 90-d readmission rates, 2-y implant-related complications including periprosthetic joint infections (PJIs), and healthcare expenditures. Pearson's chi-square analyses were used to compare patient demographics of the screened vs. non-screened patients. Welch's t-tests were used to compare LOS and costs of care. Multivariable logistic regression models were used to calculate odds (OR) and 95% CIs of developing medical complications, implant-related complications, and being readmitted within 90-days following SA adjusting for age, sex, geographic region, and matched comorbidities. Following a Bonferroni-correction, a p value less than 0.005 was considered statistically significant.

Results: Patients with depression who did not undergo screening had threefold higher frequency and odds of 90-day medical complications compared to screened patients (28.08 vs. 7.26%; OR: 3.33, $p < 0.0001$), including myocardial infarctions (1.04 vs. 0.36%; OR: 2.37, $p = 0.003$), pneumonias (7.99 vs. 2.55%; OR: 2.88, $p < 0.0001$), deep venous thromboses (1.39 vs. 0.36%; OR: 3.25, $p < 0.0001$), pulmonary emboli (1.40 vs. 0.45%; OR: 2.62, $p = 0.0002$), transfusions (2.96 vs. 0.39%; OR: 6.67, $p < 0.0001$), acute kidney injuries (6.52 vs. 1.49%; OR: 4.08, $p < 0.0001$), and cerebrovascular accidents (2.70 vs. 0.93%; OR: 2.58, $p < 0.0001$). Readmission rates (3.48 vs. 3.97%; $p = 0.719$) and LOS (1.80 vs. 2.02 d; $p = 0.095$) were similar between patients screened vs. not screened. Overall 2-year implant-related complications were higher in patients without screening vs. those who were screened within 90 days of surgery (15.89 vs. 8.02%; OR: 1.93, $p < 0.0001$), including PJIs (2.05 vs. 0.93%; OR: 2.04, $p < 0.0001$). Within the 90-day episode of care interval, healthcare expenditures were significantly lower in depressive disorder patients screened within 3 months of surgery ($8,703 vs. $10,916; $p < 0.0001$).

Conclusion: Depressive disorder patients undergoing screening within 3 months of surgery appears to decrease overall 90-day medical complications and 2-year implant-related complications. Additionally, screening appears to decrease the 90-day episode of care interval expenditures by over $2000 in a matched population. These findings may be useful for shoulder arthroplasty surgeons in the 3 months prior to surgery as they may council their depressive disorder patients about the importance of having a recent screening by their physician.

P183
A NATIONWIDE ANALYSIS OF THE IMPACT OF SOCIOECONOMIC STATUS ON OUTCOMES AFTER TOTAL KNEE ARTHROPLASTY USING THE AREA DEPRIVATION INDEX: CONSIDERATION OF THE DISADVANTAGED PATIENT

A. Gordon[1], R. Vakharia[1], M. Mont[2]

[1]Maimonides Medical Center, Brooklyn, [2]Rubin Institute of Advanced Orthopedics, Baltimore, USA

Objective: Socioeconomic status (SES) has been demonstrated to be an important prognostic factor among patients undergoing surgery including total joint arthroplasty. Measures of socioeconomic disadvantage may enable improved targeting of measures to prevent and recognize potential increased healthcare utilization in these disadvantaged patients. The Area Deprivation Index (ADI) is a weighted index comprised of 17 census-based markers of material deprivation and poverty. The purpose of this study was to utilize a large nationwide administrative claims database to determine whether patients with high ADI (greater disadvantage) undergoing TKA is associated with differences in: (1) medical complications; (2) emergency department (ED) utilization; (3) readmission rates; and (4) costs of care.

Methods: A retrospective query of all primary TKA patients was performed using a large private insurance database from January 1st, 2010 to October 31st, 2020. Cohorts of interest were queried using Current Procedural Terminology (CPT) codes and International Classification of Disease, Ninth/Tenth Revision (ICD-9), ICD-10 codes. ADI is reported on a scale of 0–100 with higher numbers associated with greater disadvantage. Percentile was documented for each zip code for all states. The study group consisted of patients undergoing primary TKA in zip codes associated with high ADI (90%+) as established by previously published studies. The control cohort consisted of TKA patients who underwent surgery in zip codes not defined by the study group. Patients with high ADI were 1:1 propensity score matched to controls by age, gender, and Elixhauser Comorbidity Index (ECI). This yielded 225,038 patients in total evenly matched between the two cohorts. Primary endpoints of the study were to compare 90-day medical complications, 90-day ED utilization, 90-day readmission rates, and 90-day costs of care. A multivariable logistic regression model was used to calculate the odds-ratios (OR) and 95% CIs of ADI on 90-d medical complications, ED utilization, and readmission rates. A Shapiro-Wilks test was performed to assess for normality of distribution followed by Welch's T tests for the continuous variables lengths of stay and costs. Due to the ease of finding statistical significance with large database studies, a Bonferroni correction was performed to reduce the probability of a type I error. Thus, a p-value less than 0.003 was considered to be statistically significant.

Results: High ADI patients incurred significantly higher rates and odds of developing any medical complications (11.7 vs. 11.0%; OR: 1.05, 95% CI 1.02–1.09, $p = 0.0006$), including respiratory failures (0.36 vs. 0.29%; OR: 1.28, 95% CI 1.10–1.48, $p = 0.001$), acute kidney injuries (1.67 vs. 1.45%; OR: 1.15, 95% CI 1.08–1.23, $p < 0.0001$), and urinary tract infections (3.72 vs. 3.37%; OR: 1.11, 95% CI 1.06–1.16, $p < 0.0001$). Despite lower rates of readmissions in the study vs. control groups (2.91 vs. 3.46%), high ADI patients had significantly higher rates and odds of ED visits within 90 d (4.23 vs. 3.95%; OR: 1.07, 95% CI 1.03–1.12, $p = 0.0008$). Overall day of surgery ($12,210 vs. $9,653) and 90-d expenditures ($15,066 vs. $12,459) were higher in patients from a high ADI ($p < 0.0001$).

Conclusion: Socioeconomically disadvantaged patients have increased rates and odds of all 90 day medical complications. ED utilization was higher in socioeconomically disadvantaged patients despite lower readmission rates. Measures of neighborhood disadvantage, including the ADI, could potentially be used to inform healthcare policy and improve post-discharge care.

P184
CLINICAL CASE OF WRIST AND METACARPOPHALANGEAL JOINTS ARTHROPLASTY IN A PATIENT WITH IN RHEUMATOID ARTHRITIS

A. Gorelova[1], M. Makarov[1], S. Makarov[1], S. Maglevaniy[1], A. Khramov[1], A. Kolomatskaya[2], D. Ivanov[1], E. Byialik[1], V. Byalik[1], A. Logunov[1], A. Chernikova[1]

[1]V. A. Nasonova Research Institute of Rheumatology, [2]I. M. Sechenov First Moscow State Medical Univ., Moscow, Russia

We present a clinical case of a 48-year-old female patient with diagnosed rheumatoid arthritis since 2000. At the time of hospitalization, the patient was undergoing therapy with methotrexate 20 mg/week, methylprednisolone 4 mg/day, and upadacitinib 15 mg/d. Pain, deformities of the radiocarpal joint, and metacarpophalangeal joints (MCP) had been since the onset of the disease, with increased difficulty in self-care and intensified pain over the past 2 years. Conservative treatment (brace usage, NSAIDs) showed no significant improvement.

Clinical examination demonstrated severe pain (VAS 75 mm), volar-ulnar dislocation of the wrist bones, dislocation of the head of the ulna, limited range of motion (10° of extension and 15° of flexion), ulnar deviation of fingers 2–5, and a deficit in extension of MCP joints 2–5. X-ray findings revealed osteonecrosis of the wrist bones with signs of osteoarthritis (grade 3–4), osteonecrosis of heads of the metacarpal bones, and dislocations in the MCP joints. Considering the clinical presentation, the decision was to perform joint replacement and stabilization of the wrist joint as the first step.

During the surgery, a ceramic implant was used, and additional stabilization of the wrist joint was achieved with a tendon transfer. The postoperative period proceeded without complications, and immobilization in a volar plaster splint was maintained for 3 weeks. After splint removal, the patient engaged in movement rehabilitation. At the 6-month follow-up, the patient demonstrated 25° of flexion and extension, reduced pain (VAS 10 mm), and satisfaction with joint function. The second step involved standard joint replacement of MCP joints 2–5 using silicone implants and finger extensor apparatus plastic surgery according to the original method developed by the research institute. Dynamic observation of the patient is ongoing.

Wrist joint arthroplasty with a ceramic implants ensures function restoration of the wrist joint. MCP arthroplasty in combination with extensor plasty restores the lost functions of the hand and provides the improvement of life quality in patients with rheumatoid arthritis.

P185
MACRO-MICROSCOPIC PARAMETERS OF THE TIBIA, SPLEEN AND KIDNEYS IN JUVENILE RATS AFTER EXCESSIVE CAFFEINE INTAKE

A. Movenko[1], V. Luzin[1], A. Grishchenko[1], A. Tolstenko[1]

[1]FSBEI HI St. Luka LSMU of MOH of Russia, Lugansk, Russia

Objective: To investigate the influence of caffeine after 90-d intake on macro-microscopic parameters of the tibia, spleen and kidneys in juvenile rats.

Methods: 18 juvenile rats with initial body weight 130–140 g were distributed into 3 groups. The 1st group (K-90j) involved the intact animals, the 2nd group (C-90j) comprised the animals that received intragastric caffeine daily in dosage of 120 mg/kg. Animals of the 3rd group (CM-90j) received caffeine in the same way as 2nd group treated with subcutaneous injections of mexidol in dosage of 50 mg/kg of body weight daily. Upon expiration of observation terms, HE stained horizontal mid-shaft sections of the tibia were taken to morphometry. Sections of the spleen and kidneys at the hilum level were examined under 16 × magnification.

Results: In animals of the C-90j group by the 90th day, area of the compact substance of the tibial diaphysis was less than the K-90j group by 6.55%, and area of the bone marrow cavity increased by 6.74%. Area of the renal cortex increased by 13.40%, and area of the medulla by 10.10%. As a result, the cortical-medullary ratio exceeded the control values only by 90 d of the experiment by 3.09%. The area of the white pulp of the spleen and stroma increased by 4.81% and 5.10%, and area of the red pulp increased by 19.83%. In animals of the group CM-90j (in comparison with C-90j group), area of the cortical bone of the diaphysis increased by 4.73%, and area of the bone marrow cavity decreased by 4.45%. The area of the renal cortex decreased by 7.16%, and area of the medulla by 4.39%. Total area of the spleen was larger by 7.88%, and area of the red pulp by 12.88%.

Conclusion: Excessive 90-d caffeine intake results in decrease of bone formation and increased resorption in the diaphysis of the tibia, increased area of the cortical substances of the kidneys and white pulp of the spleen. Administration of mexidol to animals taking excessive caffeine results in restoration of macro-microscopic parameters of the studied organs.

P186
LUNG FUNCTION AFTER MENOPAUSE: INFLUENCE OF BONE MINERAL DENSITY

R. Martín Holguera[1], A. I. Turrión[2]

[1]Universidad de Salamanca, Facultad de Medicina, Departamento de Anatomía e Histología, [2]Hospital de Salamanca, Servicio de Reumatología, Salamanca, Spain

Objective: To compare spirometric results between nonmenopausal and menopausal women and to determine if there is an association of BMD with spirometric results.

Methods: We studied 112 healthy and nonsmoking women (57 menopausal). Spirometry and DXA were performed. A descriptive analysis of the variables was performed, and the differences in means of both groups were assessed using t-test for independent samples. Partial correlation and multiple linear regression analyses were performed to study the relationships between spirometric and BMD variables.

Results: The mean values of FVC and FEV_1 in the non-menopausal group were significantly higher ($p < 0.01$). In nonmenopausal women, no significant associations were found between BMD and spirometric parameters. In menopausal women we found, after performing partial correlations, a positive and very significant association between BMD in the lower extremities and FVC and FEV_1.

Conclusion: There is a very significant decrease in spirometric results in the menopausal group compared to those in the non-menopausal group, although the loss of BMD after menopause does not appear to play an important role in the accelerated decline in lung.

P187
LUNG FUNCTION AND BONE MINERAL DENSITY ON HEALTHY MEN

R. Martín Holguera[1], A. I. Turrión[2]

[1]Universidad de Salamanca, Facultad de Medicina, Departamento de Anatomía e Histología, [2]Hospital de Salamanca, Servicio de Reumatología, Salamanca, Spain

Objective: Several studies have demonstrated an association between osteoporosis and lung function in patients with chronic respiratory diseases. The target of the present study is to research whether there is an association between BMD and the spirometry results in a group of healthy nonsmoking men.
Methods: A group of 142 healthy and nonsmoking men was studied. Forced spirometry and DXA to quantify BMD were performed. Partial correlation and multiple linear regression analyses were performed to study the relationships between spirometric and BMD variables.
Results: The associations found between FEV_1 and FVC and BMD variables were positive and very significant ($p < 0.01$), after performing partial correlations adjusting for the confounding factors age and BMI. The FEV_1/FVC index showed no association with BMD. In the linear regression study, FEV_1 is the parameter with the highest coefficient of adjusted determination (R^2) for all BMD variables.
Conclusion: Osteoporosis has a higher prevalence in women, and it is more common for women to undergo densitometries to determine BMD. These tests are routinely performed during the perimenopause stage. However, this practice is not generalized among men, in which the diagnosis of osteoporosis is often delayed and takes place after the appearance of pathological fractures. Densitometry techniques such as DXA, which has been used in this study, are complex and not easily accessible. However, spirometry is a simple and low-cost technique which is routinely applied in general health check-ups and medical examinations in the workplace. The results of our study show that spirometry may help to detect men with a higher risk of osteoporosis and that spirometry results might be included as an individual risk factor in indexes that assess the risk of osteoporosis fracture.

P188
SECONDARY PREVENTION OF OSTEOPOROSIS IN HIP FRACTURES IN ELDERLY PATIENTS: CLINICAL AND FUNCTIONAL PROFILE OF USERS

B. Miguel Ibáñez[1], C. Pablos Hernández[2], O. Martínez González[1], M. Ibáñez Martínez[1], C. C. Chacón Vélez[1], L. Blanco Ramis[1], M. Martín Martínez[1], C. Hidalgo Calleja[1], C. Montilla Morales[1], O. Compán Fernández[1], L. Lorenzo Rodríguez[1], J. V. Hernández Madrid[1], S. Gómez Castro[1], J. F. Blanco Blanco[3], A. González Ramírez[2], A. I. Turrión Nieves[1]

[1]Rheumatology Dept. of Univ. Healthcare Complex of Salamanca, [2]Geriatric Dept. of Univ. Healthcare Complex of Salamanca, [3]Traumatology Dept. of Univ. Healthcare Complex of Salamanca, Salamanca, Spain

Objective: To describe clinical characteristics of hip fractures, as well as falls, previous fractures, and anti-osteoporotic treatments in 609 elderly patients.
Methods: A descriptive, retrospective and observational study was conducted by analyzing demographic and clinical characteristics, and geriatric indexes of 609 patients who presented with low-impact hip fracture in 2022 and 2023.
Results: The average age of the patients was 87.29 y, with a range of 62–102 y and a predominance of women (456). During admission, a comprehensive geriatric evaluation of the situation prior to the fracture was completed. At a functional level the Barthel Index revealed that 437 patients had slight dependency in their daily life activities. Regarding their instrumental activities, 317 patients showed a score between 0–1. After their hip fracture, 445 patients received physical therapy in hospital and 190 patients required social interventions for their subsequent recovery. 327 patients had suffered falls over the last year. However, according to the Downton scale, 606 of them presented at least one risk factor for falls. Prior to their hip fracture, 155 patients had suffered a previous low-impact fracture. More than one previous fracture was found in 20 cases. Only 33 out of the 155 patients with previous fractures were receiving or had received antiresorptive or bone forming therapy. All the patients received anti-osteoporotic treatment as secondary prevention upon discharge.
Conclusion: Osteoporosis is an underdiagnosed and undertreated condition. Previous fractures often go untreated, which leads to new fractures that compromise the patients' quality of life, independence and survival. Falls very frequently cause fractures among the elderly population. Their primary prevention and an adequate osteoporotic treatment must be a priority in elderly care.

P189
HIP FRACTURES IN THE ELDERLY: EVOLUTION, READMISSION, REFRACTURE AND ONE-YEAR MORTALITY

B. Miguel Ibáñez[1], A. González Ramírez[2], O. Martínez González[1], M. Ibáñez Martínez[1], C. C. Chacón Vélez[1], L. Blanco Ramis[1], M. Martín Martínez[1], C. Hidalgo Calleja[1], C. Montilla Morales[1], O. Compán Fernández[1], L. Lorenzo Rodríguez[1], J. V. Hernández Madrid[1], S. Gómez Castro[1], J. F. Blanco Blanco[3], C. Pablos Hernández[2], A. I. Turrión Nieves[1]

[1]Rheumatology Dept. of Univ. Healthcare Complex of Salamanca, [2]Geriatric Dept. of Univ. Healthcare Complex of Salamanca, [3]Traumatology Dept. of Univ. Healthcare Complex of Salamanca, Salamanca, Spain

Objective: To describe the evolution in the first year of a cohort of elderly patients with osteoporotic hip fracture.
Methods: Observational, descriptive, longitudinal and prospective study of the refractures, readmission and mortality of 223 elderly patients hospitalized in 2022 for hip fractures from their discharge to December 2023.
Results: The mean age of the patients was 87.21 y, with a range of 62–102 y, and a predominance of women (169). After the hip fracture, anti-osteoporotic treatment was prescribed to all patients. The most common reason for readmission was a new fragility fracture (12). In half of these patients, the hip fracture had taken place more than 6 months prior, and there was total lack of adherence to the prescribed anti-osteoporotic treatment. In the series of 223 patients with hip fracture, 67 were readmitted within the first year of follow-up for the reasons included in Fig. 1. With regard to mortality (Fig. 1), 18 of the 41 registered deaths took place during the readmission, in half of these cases due to a respiratory infection.

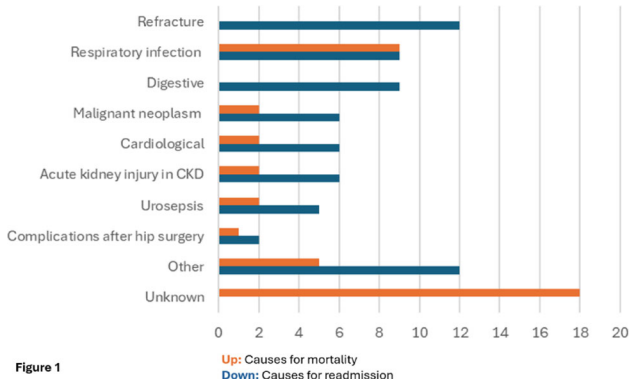


Figure 1

During their hospitalization for a hip fracture in 2022, a comprehensive geriatric assessment of the situation prior to the fracture was conducted. The patients who died in 2023 presented a worse functional outcome and performed fewer instrumental activities (Table 1).

Table 1. Geriatric indexes

		Living (182)	Dead (41)
Katz	N/A	3/1.65%	-
	A-B	94/51.65%	8/19.51%
	C-D-E	52/28.57%	24/58.54%
	F-G	33/18.13%	9/21.95%
Lawton Brody	N/A	4/2.2%	-
	0-1	79/43.41%	29/70.73%
	2-4	49/26.92%	10/24.39%
	≥5	50/27.47%	2/4.88%

Conclusion: The post-fracture mortality rate is in line with the published statistics, and it reveals that it is necessary to look for measures to prevent complications, help the patients recover their functional status prior to the fracture and monitor their adherence to the anti-osteoporotic treatment to prevent refractures.

P190
LONG-TERM SUSTAINED BENEFITS OF VISCOSUPPLEMENTATION WITH DIFFERENT MOLECULAR WEIGHT INTRA-ARTICULAR HYALURONIC ACIDS IN THE TREATMENT OF OSTEOARTHRITIS OF THE KNEE. HAV-OAK: A RETROSPECTIVE INDIAN COHORT STUDY OF MORE THAN 15 YEARS

A. K. Aggarwal[1], N. Aggarwal[1], J. Fitzpatrick[2]

[1]Institute of Rheumatology & Pain, Ghaziabad, India, [2]Univ. of Melbourne, Faculty of Medicines, Dentistry and Health Sciences, Parkville, Australia

Objective: Knee osteoarthritis (OA) is a progressive degenerative condition resulting in functional loss, pain, and discomfort. Viscosupplementation (VS) with intra-articular hyaluronic acid (IAHA) injections has been shown to have protective physiochemical functions and may confer disease-modifying, long-term effects in OA. However, conflicting guidelines, pooling of results for different molecular weight (MW) products, and a paucity of long-term clinical studies have resulted in a lack of confidence in the results of IAHA. The primary objective of the study was to determine the long-term sustained effects of vs. with different MW IAHA in Knee OA in maintaining functional improvement. The secondary objective was to determine the required interval between follow-up injections with different MW of VS.
Methods: We performed a retrospective analysis of a 15-year cohort from a single centre (India). The inclusion criteria were adults with b/l knee OA with functional reduction and radiological KL Grade III & IV, treated with Non-Animal Derived IAHA. Subjects were stratified into two groups based on the MW of the hyaluronic acid used: high MW—6–8 mg/ml—6 ml (HMW-HA), or very high MW—20 mg/ml—3 ml (VHMW-HA). The primary outcome measure was responder rates with improvement in WOMAC scores of $> 30\%$ from baseline vs. nonresponders. Those with a response lasting > 6 months after each injection were considered as sustained responders.
Results: A total of 2037 (female (F) 1467 (72.02%) and male (M) 570 (27.98%)) patients were treated. The total primary responders were 1496 (73.44%) with 1099 (74.91%) F and 397 (69.65%) M. Compared to HMW-HA, VHMW-HA had significantly higher primary responders (75.21 vs. 70.22%, $p = 0.015$) and significantly lower nonresponders (24.79 vs. 29.78%, $p = 0.015$). The sustained responders were 1186 (79.28%) of the primary responders. The sustained response was significantly greater with VHMW-HA vs. HMW-HA (85.54 vs. 67.06%, p-value < 0.0001). The average interval between the first and the third injections was significantly larger for VHMW-HA vs. HMW-HA—5.67 (median 25th–75th percentile—5.392–6.036) vs. 1.95 (median 25th–75th percentile—1.753–2.24) years. P-value < 0.0001.
Conclusion: 73.44% of responders justify treatment with IAHA. The sustained response with VHMW-HA was $>$ HMW-HA. VHMW-HA has a longer duration than HMW-HA.

P191
BONE FRACTURES AS A COMPLICATION OF OSTEOMALACIA DUE TO UNDIAGNOSED CELIAC DISEASE

A. K. Kukovic[1], N. Kravos Tramsek[1]

[1]Univ. Medical Centre Maribor, Dept. of Endocrinology and Diabetology, Maribor, Slovenia

Objective: We describe a case of osteomalacia secondary to long-standing untreated celiac disease, diagnosed after bone fractures and resistance to vitamin D treatment.
Methods: We present the case of a 54-year-old woman with no chronic conditions, who was referred to orthopedics due to groin discomfort and pain in her right hip persisting for three months. An MRI scan revealed fractures of the right pubic rami and greater trochanter of the left femur with associated bone edema. The patient denied any recent falls. She reported weight loss, fatigue, and night sweats, initially attributed to menopause. Physical examination was unremarkable except for malnutrition (BMI 16 kg/m^2). Blood tests showed anemia (Hb 87 g/L), hypocalcemia of 2.04 mmol/L, normal serum phosphate levels, albumins, elevated alkaline phosphatase (3.27 ukat/L). Further investigations, including CT scans of the thorax and abdomen and a bone lesion biopsy, did not confirm malignancy. Additional testing revealed severe vitamin D deficiency (10.3 nmol/L), elevated markers of bone turnover, and elevated i-PTH (120.3 ng/L). BMD measurement showed decreased values (T score left hip − 4.3 SD; lumbar spine -4.5 SD). SPECT revealed elevated osteoblastic activity in the skull, ribs, spine, femur, and tibia periosteum.
Results: The patient was diagnosed with osteomalacia. At follow up visit serum levels were still low, despite calcitriol and cholecalciferol treatment. Serological tests (endomysial antibodies and anti-transglutaminase IgA antibodies) and a digestive biopsy confirmed the

diagnosis of celiac disease. The patient was treated with a gluten-free diet and continued vitamin D supplementation.

Conclusion: Osteomalacia in adults results from decreased mineralization, associated with reduced bone density, loss of trabecular patterning, and variable thinning of the cortices, seen as pseudofractures on radiological images, commonly found near the femoral neck and pelvis. Osteomalacia with typical radiological changes is a rare first presentation of celiac disease in adults.

P192
IN VITRO EFFECTS OF A FOLLICLE-STIMULATING HORMONE RECEPTOR ANTAGONIST ON THE FORMATION AND ACTIVITY OF OSTEOCLASTS DERIVED FROM RAW264.7 MURINE MACROPHAGES

E. Scheepers[1], M. Naude[1], C. Newton[1], A. Kasonga[1]

[1]Univ. of Pretoria, Pretoria, South Africa

Low levels of oestrogen are known to be a major contributor to postmenopausal osteoporosis. However, decreases in oestrogen are also known to result in an increase in follicle-stimulating hormone (FSH) due to a decrease in negative feedback. Recent studies have demonstrated that this increase in FSH may play a role in bone loss by increasing osteoclast activity. These studies suggest that bone loss during perimenopause, where serum oestrogen levels are normal, may be caused by increasing FSH. Furthermore, hypogonadal FSH receptor (FSHR) knockout mice have been shown to be resistant to bone loss. FSHR is known to be expressed in several cells in the body, including bone-resorbing osteoclasts. While FSH antibodies have been shown to improve bone health in ovariectomized mice, there are currently no studies investigating the effects of small molecule FSHR antagonists on bone. Therefore, this study aimed to investigate the effect of an FSHR antagonist on osteoclast formation and activity.

RAW264.7 murine macrophages were differentiated into osteoclasts with the addition of 15 ng/mL RANKL. Western blotting confirmed the presence of the FSHR on the RAW264.7 cells. The cells were treated with FSH (50 ng/mL) and the activation of FSHR was confirmed by cyclic adenosine monophosphate (cAMP) ELISA. FSH (50 ng/mL) was shown to not affect the cell viability of undifferentiated RAW264.7 cells but did result in a small increase in osteoclast activity. The nonpeptide FSHR antagonist used in this study was shown to not affect cell viability at 1 pM–1 μM concentrations. However, the FSHR antagonist (1 nM–1 μM) decreased both the size and number of osteoclasts formed.

These results suggest that FSHR is expressed in RAW 264.7 murine macrophages, and non-peptide FSHR antagonists have the potential to decrease osteoclast formation and activity. Ongoing studies are investigating the mechanism of action of the FSHR antagonist in the RAW264.7 cells. These studies will shed further light on the potential of FSHR as a therapeutic target for postmenopausal osteoporosis.

P193
EFFECT OF DIALLYL TRISULFIDE ON OXIDATIVE STRESS MARKERS AND OSTEOCLAST FORMATION IN RAW264.7 MURINE MACROPHAGES

M. Mukozi[1], M. Visagie[1], A. Kasonga[1]

[1]Univ. of Pretoria, Pretoria, South Africa

In bone degenerative disorders, such as osteoporosis, over-active osteoclasts result in fragile bones that fracture readily. Inhibiting osteoclast activity represents a viable strategy to combat bone degeneration. Osteoclasts are large, multinucleated bone resorbing cells. RANKL binds to its receptor, RANK, on osteoclast precursors to stimulate differentiation and maturation into osteoclasts. Reactive oxygen species generation (ROS) as well as NF-kB and mitogen-activated protein kinase (MAPK) pathways are crucial for osteoclast differentiation and activation. Diallyl trisulfide (DATS) is a garlic-derived organosulfur compound that has demonstrated potent anti-cancer properties in vitro. However, the effects of DATS on osteoclast formation and function remains unknown. Therefore, the aim of this study was to determine the effects of DATS on osteoclast formation and function using RAW264.7 murine macrophages.

Using a resazurin assay, DATS (1–5 μM) was shown to have no effect on cell viability. RAW264.7 cells were then differentiated into osteoclasts using RANKL and stained for tartrate-resistant acid phosphatase (TRAP). DATS was shown to decrease the number TRAP positive osteoclasts formed. Western blotting analysis determined that DATS inhibited the activation of key MAPKs (Jun N-terminal kinase (JNK) and p38). However, DATS showed no effect on the activation of NF-kB. DATS was further shown to increase the expression of the antioxidative protein, nuclear factor erythroid 2-related factor 2 (Nrf2), while decreasing expression of the oxidative stress marker, nicotinamide adenine dinucleotide phosphate oxidase 1 (Nox1).

DATS was shown to be a potent inhibitor of osteoclasts through targeting MAPK signalling and ROS pathways. These results demonstrate that DATS may have potential as a therapeutic option in the treatment of osteoporosis. In addition, data obtained in the current study may potentially lead the identification of novel biochemical markers for improved future treatment strategies for bone disorders.

P194
EFFECTS OF CHRYSIN ON OSTEOCLASTOGENESIS IN RAW264.7 MURINE MACROPHAGES AND BONE METABOLISM IN SPRAGUE DAWLEY RATS

C. Mason[1], T. Nyakudya[1], A. Kasonga[1]

[1]Univ. of Pretoria, Pretoria, South Africa

Bone is a metabolically active tissue that is continuously resorbed and reformed by osteoclasts and osteoblasts respectively. Excessive osteoclast activity can lead to bone degenerative disorders such as osteoporosis. RANK signalling is crucial for osteoclast formation and function. RANKL binding to its receptor RANK will lead to the activation of nuclear factor of activated T-cells, cytoplasmic 1 (NFATc1), the master regulator of osteoclasts. Targeting RANK signalling in osteoclasts could offer a viable strategy in the treatment of osteoporosis. Chrysin is a bioactive phytochemical that has shown to possess several metabolic benefits, such as anticancer and antispasmodic properties. However, the effects of chrysin on bone remain unexplored. The aim of this study was to investigate the potential bone protective effects of chrysin.

Tartrate resistant acid phosphatase (TRAP) staining was conducted to determine the effect of chrysin on osteoclast differentiation. TRAP-positive cells of three or more nuclei were counted. qPCR was conducted to determine the effect on key osteoclast genes. Western blotting was conducted to determine the effect of chrysin on the RANK signalling pathways. μCT was performed was used to evaluate the tibia bones in Sprague Dawley rats who were fed a diet high in chrysin.

TRAP staining showed that chrysin (5–100 μM) significantly decreased the number of osteoclasts formed compared to the positive control. The IC50 (14 μM) was determined. qPCR analysis showed the NFATc1 expression was significantly inhibited at day 5, and TRAP expression at day 3 and 5. Western blot analysis showed a decrease in the phosphorylation of extracellular signal-regulated kinase (ERK), a key regulator of RANK signalling. However, the

analysis of the tibia bones showed that chrysin did not have any significant effects on bone health.

The results indicate that chrysin inhibits osteoclastogenesis through the inhibition ERK signalling leading to an inhibition of NFATc1 and TRAP genes. Further studies are needed to evaluate the in vivo effects of chrysin. These findings demonstrate the potential of chrysin as a therapeutic agent in bone degeneration.

P195
CORRELATION BETWEEN KNEE OA AND GRIP STRENGTH IN POSTMENOPAUSAL FEMALE

A. Kaur[1], G. Msp[1], R. Thakur[1], D. Wadhwa[1]

[1]MVP's College of Physiotherapy, Nashik, India

Objective: The preferred approach for assessing muscular strength necessary for diagnosing sarcopenia is hand grip strength, which has a positive correlation with quadruple movement strength. Individuals who are obese and sarcopenic are said to have an increased chance of developing knee osteoarthritis. Thus handgrip examination can be useful in assessing knee OA's functional and radiological outcomes. This study aimed to determine whether hand grip strength and radiographic and functional indications of osteoarthritis in the knee were related.
Methods: 53 postmenopausal female patients (mean age: 62.4 ± 8.6 y; range, 50–80 y) with bilateral persistent knee pain were included in the study. They were diagnosed with knee OA based on radiological and clinical findings in compliance with the 2019 American College of Rheumatology recommendations. The BMI, hand dominance, and patient demographics were noted. The Lower Extremity Functional Scale (LEFS) and WOMAC were used to evaluate the functioning of the knee OA. For the radiological evaluation of knee OA, the Kellgren-Lawrence (KL) grading system was used. The dynamometer was utilized to test the hand grip strength, and the findings were adjusted based on the BMI.
Results: A negative, moderate association was discovered between WOMAC and hand grip strength in the evaluation of the link between knee OA functioning and hand grip strength ($p < 0.05$). Furthermore, a moderately positive connection ($p < 0.01$) was discovered between the hand grip strength and the LEFS. There was no significant correlation between Kellgren–Lawrence grading and hand grip strength.
Conclusion: The results of the study demonstrate a functional and radiological relationship between hand grip strength and knee OA. In the functional assessment of knee OA, hand grip strength should be included in the WOMAC and LEFS. Additionally, new scales incorporating the assessment of hand grip strength should be created.

P196
IMPACT OF SQUARE STEPPING EXERCISE VERSUS BOSU BALL EXERCISE ON BALANCE IN A INSTITUTIONALIZED ELDERLY WITH LOW BONE MASS

A. Kaur[1], G. Msp[1], R. Thakur.[1]

[1]MVP's College of Physiotherapy, Nashik, India

Objective: Falls are a serious public health concern and one of the main causes of harm and mortality for older individuals. Even while falls are prevalent among the elderly, current studies have shown that those living in long-term care facilities had higher rates of falls than those living in the community. In senior people living in residential care facilities, balance becomes more compromised due to sedentary lifestyles, physical and mental impairments, and bodily damage that can lead to falls. Therefore, comparing the effects of Bosu ball exercise and square stepping exercise (SSE) on balance in an older population living in institutions was the primary objective of the research.
Methods: Thirty elderly individuals who were ambulatory and 60 years of age or older were randomly assigned to two groups in this study. Group A: SSEs. Group B: Bosu ball exercises. Variables: (i) dependent variables: balance. (ii) independent variables: square stepping exercises, Bosu ball exercises. Outcomes measure was Berg Balance Scale (BBS). Group A: SSEs for a period of 12 weeks, the SSE group participated the supervised group session thrice a week. SSEs, warmup and cool down activity exercises had been given during each session. SSE is performed on a thin, 100 × 250 cm felt mat that has been divided into 40 squares, each measuring 25 cm. Group B: Bosu ball exercise was given for thrice a week for 12 weeks with warm up and cool down exercise.
Results: The analysis of the data was done after 12 weeks. The balance score was assessed using a paired t-test within the group and an Independent sample t-test between the groups under the SSEs and Bosu ball exercises training. $P < 00.5$ was designated as the significant level for the P-value. This outcome demonstrated that there was no discernible difference in the BBS between the two groups at baseline treatment. (The P-value is 0.369). Following a 12-week exercise regimen, Group A's BBS increased (P-value = 0.016). Thus, the results indicated that Group A was more significant than Group B.
Conclusion: According to the study, the elderly population's balance significantly improved after receiving Bosu ball training. However, under SSEs training, improvement is significantly greater.

P197
COMPARATIVE ANALYSIS OF PERIPROSTHETIC FRACTURES IN TOTAL HIP ARTHROPLASTY BETWEEN PATIENTS WITH RHEUMATOID ARTHRITIS AND OSTEOARTHRITIS

A. Khramov[1], M. Makarov[1], S. Makarov[1], S. Maglevaniy[1], A. Gorelova[1]

[1]Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Surgical treatment of patients with rheumatoid arthritis (RA) is associated with an increased risk of complications due to the presence of an inflammatory process, prolonged intake of glucocorticoids (GC), disease-modifying and genetically engineered biological drugs, reduced physical activity, functional disorders and severe osteoporosis. All this contributes to an increased risk of intraoperative complications, including periprosthetic fractures. We aimed to conduct a comparative analysis of periprosthetic fractures, which included intraoperative fractures of the large and small trochanter, as well as the acetabulum, during total hip arthroplasty (THA) in patients with RA and osteoarthritis (OA).
Methods: 1173 hip replacement operations were performed in patients with RA and OA in the period from 2002–2022 (OA: 709, RA: 484).
Results: A total of 41 (3.49%) periprosthetic fractures were diagnosed during THA. Of these: 23 (4.96%) fractures occurred in patients with RA; 18 (2.54%) in patients with OA. In most cases, osteosynthesis with intraosseous sutures, circular sutures with wire or plate was performed for the treatment of periprosthetic fractures (61.8%), and Wagner's long revision leg was also used. Osteosynthesis was performed more often in patients with OA (66.7%), less often in patients with RA (43.5%). Statistical analysis of the data revealed a significantly higher number of complications in the group of RA patients ($p = 0.0288$). Significant differences were also obtained in the analysis of each type of complications ($p < 0.05$).
Conclusion: Obtained results confirmed that the risk of periprosthetic fractures was 2 times higher in RA patients than in patients with OA. Therefore, these patients require a special approach, which includes in

the competent medical perioperative treatment of osteoporosis and careful handling of bone and surrounding soft tissues during the operation.

P198
DIURETICS AND OSTEOPOROSIS IN POSTMENOPAUSAL WOMEN

A. Kollcaku[1], J. Kollcaku[2], V. Duraj[1]

[1]"Mother Teresa" Univ. Hospital Center, [2]Specialities Health Center No. 3, Tirana, Albania

Objective: Loop diuretics increase bone turnover by augmenting urinary calcium excretion while thiazide diuretics lower calcium excretion. Estrogen cease appears to be an important risk factor in the development of osteoporosis in postmenopausal women. This study aimed to assess the role of diuretics usage in BMD in postmenopausal women.
Methods: It was a cross-sectional study already done in the capital city of Albania with the participation of 4789 postmenopausal women. All subjects were asked if they were using furosemide, hydrochlorothiazide, or other diuretics. They were screened for osteoporosis by using an ultrasound system, based on T-score values of BMD evaluation. Binary logistic regression was used to determine the relationship between osteoporosis and independent factors such as diuretics treatment in this study population.
Results: Osteoporosis was positively associated with diuretics treatment ($r = 0.007$, $p < 0.001$). Of the total number of subjects, 5.5% were using furosemide, 9.1% were using thiazide, and 4% were using other diuretics. On the other hand, 12% of the total number of women diagnosed with osteoporosis were using furosemide, 12.4% were using hydrochlorothiazide, and 8% were using other diuretics. We found a significant statistical correlation between osteoporosis and furosemide usage for P value < 0.001, osteoporosis and hydrochlorothiazide usage for P value < 0.007, and osteoporosis and other diuretics usage for P value < 0.001.
Conclusion: The study offers useful evidence of the diuretic effect on bone turnover. Loop diuretics are well known for their negative effect on bone turnover. This study suggests also that thiazide diuretics do not protect against osteoporosis in postmenopausal women.

P199
POSTMENOPAUSAL AND GLUCOCORTICOID INDUCED OSTEOPOROSIS

A. Kollcaku[1], J. Kollcaku[2], V. Duraj[1]

[1]"Mother Teresa" Univ. Hospital Center, [2]Specialities Health Center No. 3, Tirana, Albania

Objective: Glucocorticoids indicate bone turnover due to inhibition of bone formation early and increase of bone resorption later. Following initiation of glucocorticoids rapid bone loss occurs. The duration of glucocorticoid treatment plays a key role in bone loss. This study aimed to assess the role of duration of treatment with glucocorticoids in inducing osteoporosis in postmenopausal women.
Methods: It was a cross-sectional study in postmenopausal women and all subjects (4789) were screened for osteoporosis by using an ultrasound device. All subjects with T-score results below -2.5 were diagnosed with osteoporosis. Women were asked if they were using glucocorticoid therapy and treatment duration with less or more than three months. Binary logistic regression was used to determine the relationship between osteoporosis and independent factors such as glucocorticoid treatment duration in this study group.
Results: 13.9% of the total number of subjects diagnosed with osteoporosis were using glucocorticoid therapy for more than three months. We found a significant statistical correlation between osteoporosis and treatment with glucocorticoids for more than three months in postmenopausal women (OR: 1.52; CI 95% 1.46–1.94; $p = 0.02$).
Conclusion: The study offers strong evidence of a negative effect on bone turnover and the increased risk of inducing osteoporosis in the group of postmenopausal women who are going to use glucocorticoid treatment over three months.

P200
INTERVENTION FAILED TO STABILIZE ATLANTOAXIAL DISLOCATION IN A PATIENT WITH DIABETES AND ANKYLOSING SPONDYLITIS, AND OSTEOPOROSIS: A CASE REPORT

A. Kollcaku[1], J. Kollcaku[2]

[1]"Mother Teresa" Univ. Hospital Center, [2]Specialities Health Center No. 3, Tirana, Albania

Objective: Chronic kidney disease is associated with the deterioration of bone mass, which is called renal osteodystrophy. Patients with ankylosing spondylitis suffer from disease complications such as osteoporosis and are at risk for dislocation of the atlantoaxial joint. This case report aims to show how important is early detection of secondary osteoporosis, especially in patients with the risk of atlantoaxial joint dislocation, because of the risk of intervention failure.
Methods: The patient, a 56-year-old man, was diagnosed with chronic kidney disease 10 years ago due to the painkillers used for many years for ankylosing spondylitis. He started dialysis procedures at the same time. The patient complained of intensive cervical pain, extreme restriction of cervical mobility, and sensory disturbances in upper and lower limbs after one year of starting biological treatment with etanercept 50 mg once weekly. He was referred to the neurologist and an MRI of the cervical spine was ordered for him. Subluxation of the atlantoaxial joint was detected and bone deterioration of vertebras of the cervical spine. The patient was referred to intervention to stabilize the joint.
Results: Neurosurgical intervention already done failed to stabilize the joint subluxation because of the high grade of cervical spine osteoporosis.
Conclusion: Patients with atlantoaxial dislocation who suffer from osteoporosis are at high risk of failure to stabilize it by neurosurgical intervention. Early screening for secondary osteoporosis in patients with risk factors such as chronic kidney disease and ankylosing spondylitis is very important, especially in patients with long-term disease who are at risk for atlantoaxial joint sub/luxation.

P201
I.V. BISPHOSPHONATE PREVENTS PERIPROSTHETIC OSTEOPENIA AFTER IMPLANTATION OF A CEMENTLESS TOTAL HIP JOINT REPLACEMENT

A. Kurth[1], H. Arabmotlagh[2], C. Eberhardt[3]

[1]Dep. of Orthopaedic and Trauma Surgery, Marienhaus Klinikum Mainz, Mainz, [2]Spine Unit, Sana Klinikum Offenbach, Offenbach, [3]Arthroplasty Unit, St. Vinzenz-Krankenhaus, Hanau, Germany

Objective: Total hip arthroplasty (THA) is an effective intervention for end-stage osteoarthritis of the hip. But after surgery, loss of periprosthetic BMD has been reported, which may have a negative impact on implant survival, especially in patients with osteoporosis.

The early loss of periprosthetic bone density is mainly due to the initial local surgical irritation, but the postoperative relief of the operated leg is mainly due to the altered force flow ("stress shielding") through the prosthesis. Various studies have reported that bisphosphonates can effectively reduce periprosthetic bone density loss and prolong the survival time of implants. It is still unclear whether intravenous therapy is superior to oral bisphosphonate therapy in terms of preventing bone density loss.

Methods: 43 healthy patients were treated with cementless THA. Postoperatively, the patients were either treated with ibandronate 3 mg i.v. (twice with an interval of 3 months) (n = 23), or with Ca/Vit.D (n = 20). The periprosthetic bone density was determined by DXA measurements (Hologic 4500 plus) after 2, 4, 6 and 12 months in the regions n. Gruen (ROI) and compared with the baseline value one week after surgery. Furthermore, the results were compared with original data from a historical control group with oral alendronate 10 mg daily (Hennigs et al. Z. Orthop 2002). For the statistical analysis, an ANOVA test with a significance level of $p < 0.05$ was performed.

Results: In the control group, there was significant bone loss in the entire periprosthetic bone of up to 5% during the first few months. Ibandronate therapy completely prevented bone loss, while oral therapy reduced but did not prevent bone loss. The differences between the individual groups were statistically significant.

Conclusion: The study showed that i.v. bisphosphonate therapy with ibandronate after hip arthroplasty implantation can maintain periprosthetic BMD over 12 months and is superior to oral alendronate therapy. This confirms previous studies in which it was shown that osteointegration could be improved by the use of bisphosphonates in cementless implants. Influencing bone health with medication also shows positive effects on cementless arthroplasty and can possibly improve the longevity of the implants, even if there is a lack of conclusive studies.

P202
ARTHROPLASTY OF THE HIP IN OSTEOPOROTIC PATIENTS: A RECIPE FOR DISASTER?

R. Ene[1], A. L. Dimitriu[1], C. Georgescu[1], E. G. Popescu[1], B. Bolos[1]

[1]Clinical Emergency Hospital, Dept. of Orthopedics, Bucharest, Romania

Objective: As a result of low trauma, femoral neck fractures are very common in the elderly population. Usually, the fractures are Garden IV types, that require a form of arthroplasty (hemi or total) as surgical treatment [1]. In these cases, the presence of osteoporosis influences the implant stability [2], and may lead to implant failure of the acetabular cup or the femoral stem [3]. Of course, there is the obvious possibility of using cement, but this may affect the longevity of the implant in the more young and active population [4].

Methods: We evaluated 64 patients with femoral neck fractures Garden III and Garden IV types, that were operated in our clinic between July 2022 and February 2023. In 12 patients cementless bipolar arthroplasty was used, and in 52 patients total arthroplasty (24 cemented and 28 cementless). The decision of using cement was made either by the fact that the patients had severe osteoporosis, were elderly patients usually above 80 years old, or by the intraoperative assessment that shows a poor stability of probes. Septic patients were ruled out of the study, because the sepsis may be a cause of instability also [5].

Results: We noticed that 7 patients had mechanical failure (1 cemented cup became loose, 3 uncemented stems became also loose, and 3 cemented stems). Also, 5 patients returned to the clinic with periprosthetic fractures due to recurrent falls, and needed to be reoperated. We saw that smaller size stems were more prone to instability (up to size 9) and stem sizes above 10 were more stable. Out of these patients, 85% din not receive prior osteoporosis treatment, and they were instructed to do so after hip surgery. In the case of periprosthetic fractures, there were no difference between cemented vs. uncemented stems as protectors for periprosthetic fractures.

Conclusion: It appears that the use of bigger stem sizes is a factor of increased mechanical stability, but larger population groups need to be studied. Also, the cemented group seems to be more protected against instability of the implant, but a longer follow up needs to confirm this finding.

References

1. Haasper C, et al. Unfallchirurg 2019;122:762
2. Popescu D ER, et al. Acta Endo (Buc) 2015;11:109
3. Russell LA. Curr Rheumatol Rep 2013;15:371.
4. Mirea R, et al. Materials (Basel). 2021;14:2774
5. Lupescu O, et al. Rom J Morphol Embryol 2016;57:1137

P203
CERVICAL SPINAL INJURY SECONDARY TO A SPORTS ACCIDENT ABOUT 29 CASES

A. Mahtout[1]

[1]Regional Univ. Military Hospital of Blida, Blida, Algeria

Objective: Trauma to the cervical spine can be differentiated from a therapeutic point of view, in two situations: The unstable spine (fracture + ligament rupture) where the potential neurological risk, medullary or radicular, guides in a completely hierarchical and validated way the conduct to be held on the ground and then at a distance. The microtraumatic spine where, as we know, the frequency of 'common' spinal pain, and the functional, socio-professional and athletic repercussions, which vary greatly from one patient to another for the same lesion, involve more diagnostic and therapeutic pathways. individualized and, for the majority, primarily or even solely conservative.

Methods: We report a series of 29 patients admitted as part of the emergency at the level of the neurosurgery department/central hospital of the army and treated surgically in emergency following various sports accidents. all the difficulty of management is based on the right indication:

- Should a great sportsman be operated on or not?
- If so, what is the benefit?
- And above all can he resume his sporting activity of competition?

Results: Of the 29 athletes who had spinal cervical lesions without medullary, 21 were indicated for surgery:

– 7 patients operated by an anterior approach with discectomy followed by placement of a cervical cage and anterior osteosynthesis on one level.
– 4 patients via the posterior route due to articular collisions, having benefited from fixation via the posterior route.
– 8 patients when to them were of orthopedic indication with installation of a cervical collar with a rigorous clinical radio control.

Conclusion: The surgical indication is always posed in front of spinal instability, this must be discussed at length and with the consent of the patient in athletes. orthopedic treatment is indicated when the elements of spinal stability are not compromised, otherwise surgery is the only therapeutic recourse. The management of high level athletes requires in-depth compression of the lesion mechanisms, careful reading of radiological images and multidisciplinary management, not only surgical but functional and rheumatological rehabilitation.

P204
SHOULD A SURGERY BE PERFORMED FOR CERVICO OSTEOARTHRITIC MYELOPATHIES DECOMPENSATED BY TRAUMA TO THE CERVICAL SPINE: ABOUT 37 CASES

A. Mahtout[1]

[1]Regional Univ. Military Hospital of Blida, Blida, Algeria

The incidence of the spinal cord trauma (SCT) in Algeria is 20 people/1000 inhabitants. SCT can lead to spinal cord injury without bone involvement, particularly when a narrow cervical canal (NCC) preexists. 75% of people over 65 have a narrow cervical canal, which is the most common risk factor for spinal cord injury. Furthermore, the cervical cord is more vulnerable because it is less well vascularized, particularly in the elderly population.

We report the experience of the neurosurgery department in the care of 37 patients with cervico osteoarthritic myelopathies whose ages are between 56–78 years old and who are victims of various accidents manifested by incomplete tetraplegia evaluated by the score by JOA. Our course of action was: hospitalization of patients; implementation of a therapeutic regimen based on corticoids 2 mg/kg/d associated with adjuvant treatment; the wearing of a cervical collar and not a minerva given the absence of spinal instability; and nursing. Reassessment of the JOA score on D3 post-trauma then patient discharge. Patients systematically reviewed in spine consultation at 1 month with a reassessment of the JOA.

The neurological and functional benefit of decompressive and stabilization surgery remains controversial. In our study, early surgery did not improve neurological and functional recovery and was not associated with fewer medical complications or shorter hospital stay. Moreover, there is no evidence in the literature to encourage routine early surgery in patients with SCT on NCC without vertebral fracture. In addition, potential preoperative complications must be taken into account, particularly in the elderly population. In the acute phase, the most frequent indications for surgery are the presence of signs of clinical and/or radiological instability. The criteria traditionally used in favor of remote surgery are worsening or stagnation of a neurological state after a phase of improvement.

P205
PLACE OF CURRENT IMPLANTS IN THE MANAGEMENT OF CERVICO OSTEOARTHRITIC MYELOPATHY (COM) ABOUT 150 CASES

A. Mahtout[1]

[1]Regional Univ. Military Hospital of Blida, Blida, Algeria

Cervico-osteoarthritic myelopathy is a cervical spinal cord suffering associating a narrowing of the dimensions of the cervical canal of osteoarthritis origin, the natural evolution of the pathology is towards progressive aggravation until tetraplegia. At present there is no medical treatment, so it is an almost exclusively surgical treatment that both decompresses the cervical spinal cord.

Casereport: We report a series of 150 cases collected in the neurosurgery department, carrying CAM at the operative stage and having benefited from decompression with the addition of prosthetic material, namely cervical prostheses. The whole difficulty of the management of CAM is to pose an indication for surgery at the right time, the addition of implants in this surgery has allowed on the one hand to restore spinal biomechanics but also to restore a function of lost neck mobility.

Conclusion: We are convinced that although the cost of acquisition is relatively high, the addition of cervical prostheses allows a restoration of function and a social and professional reintegration of patients.

P206
OS ODENTOIDEUM ABOUT 3 CASES

A. Mahtout[1]

[1]Regional Univ. Military Hospital of Blida, Blida, Algeria

Objective: Bone odentoidum or mobile odontoid process is one of the malformations of the cervico-occipital hinge. It is about a defect of union of the center of ossification of the odontoid on the body of the axis. The malformation exposes you to atlo-axoid instability and the risk of bulbo-medullary compression.

Methods: We report the observation of 3 active men whose age varied between 18–247 y with a notion of craniocervical trauma and who presented progressively in 2 y persistent cervical pain and stiffness with heaviness of the four limbs with discreet sphincter disorders.

Results: The clinical examination objectified spastic tetraparesis with associated sensory disturbances Lateral flexion and extension radiographs can provide useful information about C1–C2 instability. Computed tomography (CT or simple) is useful to define bony relationships at the base of the skull, C1 and C2. The degree of C1–C2 instability identified on cervical radiographs is not correlated with the presence of myelopathy. A sagittal diameter of the spinal canal at the C1–C2 level of 0.13 mm correlates with the myelopathy detected on clinical examination. MRI can show spinal cord compression and signal changes in the cord that correlate with the presence of myelopathy. To behave given the clinical examination, the patients show signs of deficit associated with imaging objectifying a compression of the bulb, a surgical indication is posed, the intervention consisted of an occipital craniectomy opening of the occipital foramen and the posterior arc of C1 followed by C3 occiput osteosynthesis using polyaxial rods and screws.

Conclusion: The mobile odontoid process or os odontoideum is a rare anomaly of the cervico-occipital hinge for which we will recall the clinical, radiological, etiological and prognostic aspects for an adequate management. Clinical examination revealed spastic tetraparesis with associated sensory disturbances. Cervical CT and MRI confirmed the odontoid-axoid dislocation, the CT on the one hand revealing a corticalized ovoid ossicle in place of the odontoid and the MRI on the other hand the myelomalacia. The therapeutic result was conclusive after surgical approach by posterior approach. The os odontoideum designates a small bone in a position cranial to the axis and independent of the odontoid. The embryonic, vascular or even traumatic origin are evoked to explain the pathogenesis. It can be discovered incidentally in asymptomatic patients or cause sudden death without the diagnosis being recognized. If symptomatic, the age of discovery is variable and the clinical signs are upper neck pain, neck stiffness, torticollis, spinal cord or cervical radicular compression syndrome without any notion of recent spinal cord injury. Standard radiographs, better cervico-occipital CT, show a rounded or ovoid ossicle, separated from the base of the odontoid and corticalized, unlike recent fractures of the odontoid. MRI shows the repercussions on the bulbo-medullary junction. The approach of choice is the posterior approach to decompress the nervous structures and stabilize the spine. Functional rehabilitation is essential. In asymptomatic subjects, prophylactic surgery is discussed after dynamic X-rays.

P207
EXPERIENCE IN X-LINKED HYPOPHOSPHATEMIC RICKETS IN THREE HOSPITAL CENTERS IN COLOMBIA: CASE SERIES

A. Medina[1], N. Camargo[2], M. A. Rueda[2], J. Gutierrez[2], A. Roman[2]

[1]Universidad Nacional de Colombia. Medicine Faculty, [2]Fundación Universitaria de Ciencias de la Salud, Medicine Faculty, [3]Universidad de Antioquia. Medicine Faculty, Bogota, Colombia

Objective: To describe the presenting characteristics as well as the clinical and biochemical response to treatment with burosumab of 5 patients with X-linked hypophosphatemic rickets (XLH) evaluated in three hospital centers in Colombia.
Methods: Case series from three hospitals where 5 patients with a diagnosis of XLH were included, in which genetical, clinical, radiological, biochemical studies and response to treatment with burosumab were analyzed.
Results: All patients were women with an average age of 50 y. Only two patients had been diagnosed with XLH since childhood, the remaining three were diagnosed in adulthood. Most frequent clinical manifestations were: short stature, in average 1.31 m, bone deformities, altralgias, stiffness, dental loss and oral abscesses. The most common radiological findings were pseudofractures and arthrosis of the hips or knees. Three patients presented fragility fractures and two of them with enthesopathies. The average baseline hypophosphatemia was 2.0 mg/dl, 1,25-dihydroxyvitamin D < 20 ng/ml, PTH 88 pg/ml and alkaline phosphatase(AP) 181 U/L. Only two patients had their tubular phosphorus reabsorption (TPR) and tubular phosphorus reabsorption adjusted to GFR (Tmp/GFR) Tmp calculated and were $< 85\%$ and 2.8 mg/dl respectively. Genetic confirmation of the PHEX gene mutation was performed in all patients.
Conclusion: XLH is a rare entity, which, given its rarity, presents limitations and delays of even years in diagnosis as well as in early treatment, leading to great morbidity and compromise in the quality of life of patients. Once treatment with burosumab, an anti-FGF23 monoclonal antibody, was initiated at a dose of 1 mg/kg body weight per month, clinical improvement and biochemical normalization were evident: serum phosphate increased to 2.5, 3.1 and 2.7 mg/dl on average in the following controls after starting treatment; as well as a decrease in mean PTH to 68.5 pg/L was evident. Pain, stiffness, and performance using the WOMAC improved after treatment compared to baseline. The average pain scale dropped from 8.25 to 2.25; the stiffness from 10.3 to 2.3 and the functionality test from 32.2 to 10.5. Thus in our experience, we had the opportunity to describe the clinical, biochemical and general performance improvement of all patients who received burosumab as targeted XLH therapy, starting from the first dose.

P208
IMPACT OF NOSOCOMIAL INFECTIONS ON CLINICAL OUTCOME AND AUTONOMY IN ELDERLY ORTHOPEDIC PATIENTS: A RETROSPECTIVE OBSERVATIONAL STUDY IN LONG-TERM RHEABILITATION FACILITIES

A. Medioli[1], C. Rizzi[1], C. Cucchetti[1], S. Orsucci[1], V. Di Cintio[1], N. Loubadi[1], G. Civardi[1], G. Aronica[1]

[1]Clinica Sant'Antonino, Piacenza, Italy

Objective: To verify whether nosocomial infection (NI) acquired during hospitalization have influenced the clinical outcome and autonomy in daily life activities upon discharge.
Methods: In a retrospective observational study, we evaluated the prevalence of NI during the hospitalization of patients admitted to long-term rehabilitation facilities using the patients' medical records. 2974 patients were admitted to hospital from January 1, 2021 to November 30, 2023. We selected 873 orthopedic patients and analyzed those who developed NI after the second day of hospitalization. The types of NI that occurred were analysed, correlating them with the number of days of hospitalization with the following scales: Barthel, Braden, ICA (index of healthcare complexity).
Results: In the cluster of 873 patients analyzed 313 contracted NI. The average age is comparable 79.83 for patients who have no counteract NI; 79.59 for patients with NI. The type of NI contracted are as follows: E. coli; Friedlander, Proteus mirabilis, Pseudomonas, Staphylococcal infection, Streptococcal infection, Other infections, Candidiasis, Clostridium difficilis, septicemia from E. coli, staphylococcal septicemia, septicemia due to other Staphylococci, Streptococcal septicemia, other septicemia, SARS CoV2 + . The data for patients who have not contracted NI are as follow: Barthel incoming average 37.75, median 37.41, standard deviation 2.82, Barthel outgoing average 59.47, median 60.31, standard deviation 8.11, ICA incoming average 17.75. median 18.37, standard deviation 1.08, ICA outgoing average 13.94, median 14.65, standard deviation 2.12, Braden incoming average 15.92, median 16.65, standard deviation 0.48, Braden outgoing average 17.73, median 17.83, standard deviation 5.02. Average hospital stay 28.40. Patient who has contracted NI: Barthel incoming average 27.39, median 27.62, standard deviation 1.23, Barthel outgoing average 46.29, median 42.07, standard deviation 6.15, ICA incoming average 18.99, median 18.63, standard deviation 0.67, ICA outgoing average 16.21, median, standard deviation 1.30. Braden incoming average 15.10, median 15.26, standard deviation 0.32, Braden outgoing average 16.42, median 16.19, standard deviation 0.36. Average hospital stay 30.31.
Conclusion: The data analyzed confirm that the days of hospitalization in patients who contracted NI have become longer. The frailty scales used on average confirm that in elderly orthopedic patients nosocomial infections worsen the outcome.

P209
VARIATION IN CIRCULATING LEVELS OF PERIOSTIN IN OSTEOGENESIS IMPERFECTA

A. Mercier[1], E. Gineyts[2], M. Millet[2], O. Borel[3], E. Sornay-Rendu[2], M. Auroux[1], P. Szulc[2], E. Fontanges[4], J.-C. Rousseau[2], R. Chapurlat[1]

[1]INSERM Unit 1033, Univ. of Lyon; Rheumatology Dept., Hôpital E. Herriot, Hospices Civils de Lyon, [2]INSERM Unit 1033, Univ. of Lyon, [3]INSERM Unit 1033, Univ. of Lyon, [4]Rheumatology Dept., Hôpital E. Herriot, Hospices Civils de Lyon, Lyon, France

Objective: Periostin (POSTN) interacts with type 1 collagen and the Wnt-β-catenin pathway, so it may play a role in the pathophysiology of osteogenesis imperfecta (OI). Higher POSTN levels have been associated with the risk of fractures in postmenopausal women. There is no biomarker for the severity of OI, and POSTN stands out as a promising candidate due to its straightforward measurement in serum through a standardized method. The primary aim is to investigate whether there is dysregulation of POSTN in OI. The secondary objective is to determine if POSTN levels correlate with the severity and various clinical and biological characteristics of the disease.
Methods: This is a secondary analysis of 60 adult patients from the miROI study cohort, including OI types 1 and 3. These patients were compared to 60 control individuals matched for age, sex, and BMI. The measurements were made using an ELISA in serum samples. We used a t-test for the primary comparison, and Pearson's correlation coefficient was computed to identify potential correlations between serum POSTN levels and clinical and biological characteristics.
Results: Serum POSTN levels were significantly higher in the OI group compared to the control group (mean = 798 vs. 712 ng/mL; $p = 0.016$) (Fig. 1). There was no correlation with severity variables,

such as the number of severe prevalent fractures, the ratio of height to wingspan, or the severity of scoliosis. However, a significant association with the presence of dentinogenesis imperfecta (DI) (mean = 819 vs. 685 ng/mL; p = 0.03) was observed.

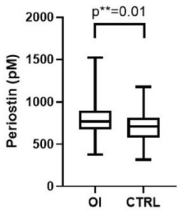


Figure 1: Box plot of the difference in circulating serum periostin levels between the Osteogenesis Imperfecta (OI) group and the control group (CTRL). P-value was calculated using a t-test

Conclusion: We have found that serum POSTN levels were higher in OI than in controls and were especially associated with the presence of DI. Considering POSTN role in collagen stability and in dentinogenesis, it may be considered as a factor in the pathophysiology of OI and a potential biomarker.

P210
OSTEOPOROSIS MANAGEMENT IN SPINAL CORD INJURY IN DEVELOPING COUNTRIES: THE MOROCCAN EXPERIENCE

A. Messouber[1], S. Skalli[1], S. Karkouri[1]

[1]Dept. of Physical Medicine and Rehabilitation, Rabat Univ. Hospital, Rabat, Morocco

Objective: Spinal cord injury (SCI) induces heightened bone turnover due to immobility, leading to an increased prevalence of osteopenia and osteoporosis, particularly below the injury site and in cases of complete injury. The BMD loss peaks within the initial four months, primarily affecting proximal femur, distal femur, and proximal tibia. This study aims to devise a standardized approach for managing osteoporosis in SCI patients, specifically tailored to the contextual constraints and resource limitations prevalent in developing countries.
Methods: An extensive literature review was conducted, analyzing relevant studies, guidelines, and expert opinions to identify evidence-based practices for preventing and treating osteoporosis resulting from immobility after SCI.
Results: While the fundamental principles of osteoporosis management are universal, addressing SCI-induced osteoporosis necessitates careful consideration of cost-effectiveness and safety for this patient subgroup. The main goal of osteoporosis management in SCI patients is prevention. A four-axis strategy is proposed:

- First, assessing bone outcomes through comprehensive evaluation of medical history and physical examination, as well as a standard laboratory and radiology tests, including baseline BMD measured via a Dual-energy X-ray Absorptiometry (DXA) scan.
- Second, implementing nutrition and lifestyle interventions such as a calcium-rich diet, sufficient sun exposure, and fall prevention education.
- Third, incorporating non-pharmacological interventions like early initiation of weight-bearing exercises, initially with a tilt table at least twice a week initially and decreased to once a week after six months.
- Finally, employing pharmacologic treatment involving calcium and vitamin D supplementation.

Conclusion: This work highlights the challenges associated with managing osteoporosis in SCI patients, emphasizing the role of weight-bearing activities in influencing bone metabolism. Considering economic constraints, the use of bisphosphonates in SCI patients requires compliance with specific indications and regulations. In light of current research, the proposed strategy appears readily implementable in developing countries, offering an effective means to enhance bone health outcomes in SCI populations.

P211
COMORBIDITIES, PHYSICAL ABILITIES AND POLYPHARMACY OF PATIENTS WITH UNILATERAL HIP FRACTURE (UHF) VERSUS SEQUENTIAL BILATERAL HIP FRACTURE (SBHF)

A. Michael[1], N. Obiechina[2]

[1]Russells Hall Hospital, Dudley, [2]Queens Hospital, Burton on Trent, UK

Objective: Hip fracture is a serious sequela of osteoporosis and falling, which could be due to plethora of diseases. It increases the risk of inpatient mortality, one year mortality, morbidity, and institutionalisation. Unfortunately, some patients, despite osteoporosis treatment, will fracture the other hip with potential worse outcome. The incidence of sequential bilateral hip fractures can range from 2–10% depending on the population studied. The aim of this study is to compare the profile and some clinical criteria of patients with unilateral hip fractures with those with sequential bilateral hip fractures.
Methods: Consecutive 137 unilateral hip fracture patients, and 23 sequential bilateral hip fracture patients were studied. Notes and electronic records were reviewed. Data collected include demographic data, comorbidities, medications, mobility and activities of daily living, AMT on admission, and discharge destinations. Some data were not available for all patients. Data collected on excel sheet and descriptive statistics were used. IBM SPSS 29 was used for statistical analysis. Risk estimates and chi-square were done to assess odds ratio.
Results: Summarised in the Table. A total of 137 unilateral hip fracture and 23 bilateral sequential hip fracture patients were analysed. There were 100 females (73%) and 37 males (27%) in the unilateral hip fracture group, whereas there were 20 females (87%) and 3 males (13%) in the sequential bilateral hip fractures group. Average age of the female patients was 82.2 and 83.5 in the unilateral and bilateral hip fracture groups respectively. Average age of the male patients was 78.3 and 79 in the two groups respectively. Patients with sequential bilateral hip fractures, compared to those with a unilateral hip fracture were older, with more females, and more percentage of patients has dementia (35 vs. 26%), malignancy (30 vs. 7%), cerebrovascular disease (43 vs. 30%), depression (22 vs. 7%), polypharmacy (95 vs. 30%) and hearing impairment (38 vs. 23%). They were more likely to be mobile with a frame (30 vs. 20%), to be dependant for ADLs (26 vs. 18%) and to be discharged to 24 h care (27 vs. 15%). However they had lower percentage of hypertension (48 vs. 61%), visual impairment (50 vs. 58%) and urinary incontinence (19 vs. 37%). Patients with sequential bilateral hip fractures were also less likely to be mobile unaided (22 vs. 39%), or to be independent for ADLs (39 vs. 45%) and had lower AMT on admission (5.8 vs. 6.8) and were less likely to be discharged to their usual residence (59 vs. 98%). None of the sequential bilateral hip fractures patients died in hospital.

Table.

Hip fracture	Unilateral Number (%)	Sequential bilateral Number (%)
Total number of patients	137	23
Female	100/137 (73%)	20/23 (87%)
Female age (y)	82.2	83.5
Male	37/137 (27%)	3/23 (13%)
Male age (y)	78.3	79
Comorbidities		
Dementia	35/137 (26%)	8/23 (35%)
Hypertension,	83/137 (61%)	11/23 (48%)
Osteoarthritis,	37/137 (27%)	6/23 (26%)
Previous osteoporotic fracture	21/137 (15%)	23/23 (100%)
Diabetes	18/137 (13%)	2/23 (9%)
Hypothyroidism	17/137 (12%)	2/23 (9%)
COPD	17/137 (12%)	2/23 (9%)
Malignancy	10/137 (7%)	7/23 (30%)
CVD, CVA or TIA	41/137 (30%)	10/23 (43%)
CKD	10/137 (7%)	2/23 (9%)
Depression	10/137 (7%)	5/23 (22%)
Visual affection	67/116 (58%)	9/18 (50%)
Hearing impairment	26/113 (23%)	6/16 (38%)
Urinary incontinence.	50/134 (37%)	4/21 (19%)
Polypharmacy (on more than 4 drugs)	41/137 **(30%)**	21/22 **(95%)**
On antihypertensive medications,	70/137 (51%)	12/21 (57%)
Diuretics	31/137 (23%)	8/22 (36%)
Antidepressants	18/137 (13%)	5/20 (25%)
Hypnotics	14/137 (10%)	1/22 (5%)
Antipsychotics	5/137 (4%)	2/22 (9%)
Admitted from		
Home	101/137 (74%)	15/23 (65%)
Residential home	22/137 (16%)	4/23 (17%)
Nursing home.	8/137 (6%)	2/23 (9%)
Sheltered accommodation	6/137 (4%)	1/23 (4%)
Mobility		
Unaided	53/137 **(39%)**	5/23 **(22%)**
With a stick	47/137 (34%)	7/23 (30%)
With a frame	28/137 **(20%)**	7/23 **(30%)**
Supervised	4/137 (3%)	1/23 (4%)
ADLs		
Independent	61/137**(45%)**	9/23 **(39%)**
Partially dependant	52/137 (38%)	8/23 (35%)
Dependant	24/137 **(18%)**	6/23 **(26%)**
Carers (for patients who were admitted from home)	36/101 (35%)	4/12 (33%)
high muscle tone	41/137 (30%)	7/20 (35%)
AMT on admission	**6.8** (for 96/137 patients)	**5.8** (for 17/23 patients)
Postoperative complication		
Delirium	15/137 (11%)	3/21 (14%)
Urinary tract inf.	16/137 (12%)	3/21 (14%)
Chest infection	14/137 (10%)	2/20 (10%)
TIA/Stroke	3/137 (2%)	1/21 (5%)
Discharge destination		
Usual residence	98/137 (72%)	13/22 **(59%)**
To rehabilitation	20/137 (7%)	3/22 (14%)
24 h care	10/137 **(15%)**	6/22 **(27%)**
Inpatient mortality	9/137 (7%)	None (0%)

Conclusion: Patients with sequential bilateral hip fractures were 3.9 times more likely to have moderate to severe frailty than the unilateral hip fracture patients (OR 3.9; CI 1.54–9.87, P = 0.005). They were much more likely to be on polypharmacy than those with unilateral hip fractures. Admission with the first hip fracture should trigger comprehensive geriatric assessment and multifactorial interventions to improve physical status, mobility and function and address frailty and polypharmacy.

P212
IS HYPOPHOSPHATASIA COMMON IN SUBJECTS DIAGNOSED WITH FIBROMYALGIA?

A. Mocritcaia[1], C. Chacur[1], E. González[1], M. B. Busso[1], T. Rodríguez[1], L. Polino[1], P. Peris[1]

[1]Hospital Clinic Barcelona, Barcelona, Spain

Objective: It has been suggested that hypophosphatasia (HPP), a rare bone disease with defective bone mineralization due to mutations in the alkaline phosphatase gene (*ALPL*), may be misdiagnosed as fibromyalgia (FM). Its wide clinical spectrum, which includes chronic pain syndrome, may partly explain this possible misdiagnosis. Therefore, it has been suggested that subjects diagnosed with FM should be screened for this condition. We aimed to analyze the prevalence of HPP in a cohort of patients with FM attended in a Rheumatology Dept.
Methods: Observational, retrospective study of a cohort of 713 patients diagnosed with FM in a Rheumatology Dept. from 2014–2021, who presented previous ALP levels determinations. Medical records (ALP levels, history of fractures and/or osteoporosis [OP], radiologic studies, pharmacological treatment, and comorbidities) were reviewed. Patients with at least 2 low ALP levels determinations were further prospectively evaluated. In these subjects, an additional study of bone metabolic parameters, ALP substrates (PLP: pyridoxal-5′-phosphate) and genetic testing for *ALPL* mutations were performed.
Results: 15/713 FM patients (2.1%) presented low ALP levels in at least 2 measurements; all were women (median age of 49 y). Serum calcium and phosphate levels were within the normal range in all subjects; 4 presented increased substrate PLP levels (> 96 nmol/l); none was receiving PLP supplementation. However, no mutations in the *ALPL* gene were observed in any of the 15 subjects. Of note, 4 had associated hypothyroidism, with 3 receiving hormonal replacement therapy with levothyroxine; one patient was receiving denosumab treatment for OP (this patient was evaluated because of low APL levels before the onset of treatment), and 2 other patients received low doses of glucocorticoids as treatment of systemic lupus erythematosus. None of these patients were receiving bisphosphonates and bone metabolism parameters were within the normal range in all of them.
Conclusion: In this cohort of patients with FM, although 2.1% presented persistent decreased ALP levels, they frequently presented comorbidities that may be associated with low APL levels, and none presented mutations in the *ALPL* gene. Our results indicate that HPP is rarely misdiagnosed as FM in a Rheumatology Department.

P213
EFFICACY OF AN ULTRASOUND-GUIDED ANALGESIC PROCEDURE IN THE THERAPEUTIC MANAGEMENT OF SYMPTOMATIC VERTEBRAL FRACTURES: PRELIMINARY RESULTS

A. Mocritcaia[1], A. Ponce[1], E. Gómez-Casanovas[2], N. Sapena[1], H. Flórez[1], A. Monegal[1], N. Guañabens[1], P. Peris[1]

[1]Hospital Clinic Barcelona, [2]BCTDR (Barcelona Centre Tractament Dolor Reumatológic), Spain, Barcelona, Spain

Objective: Osteoporotic vertebral fractures (VF) can lead to the development of chronic vertebral pain (CBP) and functional limitation. Vertebroplasty (VP) and/or kyphoplasty have shown effectiveness in reducing pain in these patients. Nevertheless, randomized clinical trial on these procedures have shown contradictory results, and thus, these procedures are not systematically recommended. Some studies suggest that blocking the spinal medial branch (SMB) could have a similar efficacy to VP. Hence, studies analyzing the utility of local anesthetic blockage techniques are needed. We aimed to analyze the effectiveness and feasibility of an ultrasound (US)-guided procedure in the vertebral column for treatment of refractory CBP associated with osteoporotic VF.
Methods: Observational study of patients with refractory CBP (visual analog scale [VAS] $\geq$ 7) associated with osteoporotic VF. US-guided blockage of the erector spinae muscle (involving blockage of the SMB) was performed with needle punction of the vertebral lamina of the fractured vertebra (2% lidocaine and 4 mg dexamethasone diluted in saline). Pain progression (VAS) was evaluated at 15 d, and at 1, 3, 6, and 12 months after the procedure. Clinical characteristics of patients were analyzed (age, gender, number and location of VF, pain duration, radiological studies, and procedure related side effects). We present the results of the 3-month follow-up.
Results: 12 patients (mean age 78 $\pm$ 7.4 y) were evaluated. Most (10/12) had CBP (VAS 8.8 $\pm$ 1.2 [range 7–10]) with a mean pain duration of 122.6 $\pm$ 126 weeks (range 2–365). 7 blockages were performed on dorsal vertebrae (D6 [2 cases], D7, D11, and D12 [3 cases]) and 5 on lumbar spine (L1 [2 cases], L3, L5 [2 cases]), showing overall pain improvement after 15 days (VAS 7.2 $\pm$ 1.7), 1 (6.8 $\pm$ 2.2), and 3 months (4.2 $\pm$ 1.9). Most of the patients evaluated (5/12) at 3 months showed significant improvement (VAS $\leq$ 4); 1 patient did not improve (had long-standing pain [1095 d] and lumbar VF), the latter likely associated with lower therapeutic response (Fig. 1). No procedure related complications were observed.

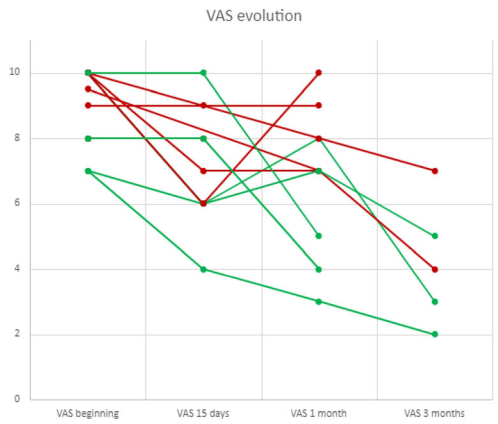


Figure 1. Evolution of pain (VAS) after a 3-month follow-up, according to the treated vertebra (dorsal in green, lumbar in red).

Conclusion: Our preliminary results suggest that a US-guided procedure in the lamina of the fractured vertebra may be a safe, effective, and feasible technique for treating refractory pain related to VF.

P214
STRUCTURAL HEART DISEASE IN PATIENTS WITH OSTEOGENESIS IMPERFECTA

A. Mocritcaia[1], C. Chacur[1], E. González[1], M. Ramos Jovani[1], A. García-Álvarez[1], H. Flórez[1], A. Monegal[1], N. Guañabens[1], P. Peris[1]

[1]Hospital Clinic Barcelona, Barcelona, Spain

Objective: Osteogenesis imperfecta (OI) is a genetic disorder characterized by connective tissue abnormalities with decreased bioavailability of collagen type I (COL1), bone fragility and increased susceptibility to fractures. While the bone OI phenotype is well described, less is known on the effects of OI in other tissues containing COL1, such as heart. Heart valves, chordae tendineae, annuli fibrosi, and the interventricular septum contain COL1, indicating the convenience to assess the presence of heart disease in OI subjects. We aimed to evaluate structural heart disease prevalence in a cohort of adult subjects with OI and its relationship with the severity of the disease and the COL1 genotype.
Methods: Retrospective study of 28 adult patients (> 18 y) diagnosed with OI. Clinical data (type and genetic mutation of OI, fracture history, presence of hearing loss, blue sclerae and/or dentinogenesis) were obtained from medical records. Laboratory, densitometric, and echocardiographic findings were also collected.
Results: Among the 28 patients (aged 19–78 years old) most with type I OI (26 type I, 1 type III, 1 type IV), 7 (25%) (median age: 32 years) exhibited echocardiographic alterations: diastolic dysfunction (1), left atrial dilatation (3, one with atrial fibrillation), aortic root dilatation (1; 38 mm), apical diverticulum (1) and significative valvulopathies (4; 14.3%). The former included 3 aortic insufficiencies (2 severe that required valve replacement and 1 moderate; 2 of these patients had a bicuspid aortic valve) and a moderate mitral insufficiency. These 4 subjects (aged 28–35) had type 1 OI, 3 were males, with several previous skeletal fractures (4–12), all had blue sclera, and none presented hearing loss nor dentinogenesis. The 2 subjects with severe valvulopathies also presented a marked low bone mass (Z-score < -4) and > 10 previous fractures. In the genetic test they showed *COL1A1* mutations affecting the glycine amino acid (p.(Gly200Asp) and p.(Gly221Arg), respectively.
Conclusion: Patients with OI may present cardiac involvement, especially heart valvular disease. Periodic screening with echocardiography seems essential to identify and manage potential severe heart complications in this disorder. Whether some mutations favor valvular disease needs further studies.

P215
SCAPULAR SPINE FRACTURE AFTER REVERSE SHOULDER ARTHROPLASTY MIMICKING A MALIGNANT TUMOUR OF THE SCAPULA: CASE REPORT AND LITERATURE REVIEW

A. Mocritcaia[1], H. Flórez[1], E. Muñoz-Mahamud[1], L. Peidro[1]

[1]Hospital Clinic Barcelona, Barcelona, Spain

Describe an unusual case of scapular spine stress fracture with non-union after reverse shoulder arthroplasty (RSA) mimicking a malignant tumour of the scapula. Review of acromion/scapular spine fractures (ASFs) after RSA and possible differential diagnoses.
Casereport: A 79-year-old female with osteoporosis (OP) treated with oral bisphosphonates underwent asynchronous bilateral RSA (right side 6/2011; left side 5/2018) secondary to rotator cuff arthropathy. In the 2-year follow-up after the left RSA, the patient reported having pain at the spine of the scapula since a few months ago. An X-ray showed no abnormalities. However, the report of a posterior MRI described high suspicion of a malignant lesion (great

bone proliferation surrounding the fracture), suggesting that metastasis or a primary tumor should be ruled out (Fig. 1A–B). A CT-guided biopsy was therefore performed showing cartilaginous proliferation without malignancy criteria, compatible with reactive changes associated with an evolved fracture. The study was completed with a CT scan, showing exuberant periscapular bone proliferation surrounding the fracture, without consolidation, suggesting non-union with a hypertrophic bone callus (Fig. 1C–D). With this diagnosis the patient was treated conservatively with favourable evolution (Fig. 1E).

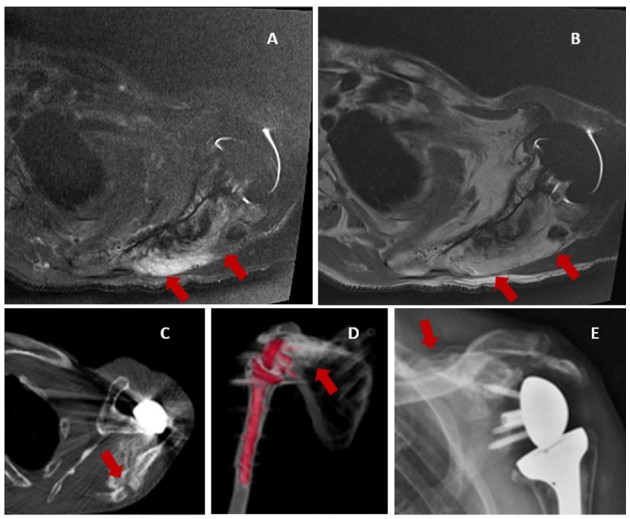


Figure 1. MRI images of the ASFs with exuberant periscapular bone proliferation surrounding the fracture line (A-B); CT images of left ASF with non-union (C-D); X-ray images of fracture consolidation one year after (E).

Conclusion: ASF following RSA (incidence: 0.8–11.2%) can significantly impact shoulder stability and function (1–3) and is the most frequent cause of pain after this procedure. Since OP is a well-known risk factor for the development of ASF, OP diagnosis and treatment may reduce the risk of fracture after RSA (2–3). Bone proliferation surrounding an ASF is very rare and can mimic a malignant scapular tumour. Thus, the differential diagnosis should include sarcomatous tumours (chondrosarcomas, Ewing sarcomas, osteosarcomas, among others), plasmacytomas and metastasis (4). Thus in the presence of pain and/or radiological alterations in the scapular spine after RSA in a patient with OP, a stress fracture should first be suspected. In the present case, the great bone proliferation surrounding the fracture indicate the need to rule out a malignant process.

References:

1. Colliton E. Orthop Clin North Am. 2021.
2. Casp A. J Am Acad Orthop Surg. 2020.
3. Xiao P. Arch Osteoporos. 2022.
4. Kaiser CL. Surg Oncol. 2020.

P216
THE ROLE OF THE ANDROGEN RECEPTOR IN SKELETAL MUSCLE SENESCENCE

A. Moretti[1], M. Di Donato[2], C. Sorrentino[2], G. Gentile[2], G. Castoria[2], A. Migliaccio[2], G. Iolascon[1]

[1]Dept. of Medical and Surgical Specialties and Dentistry, Univ. of Campania "Luigi Vanvitelli", [2]Dept. of Precision Medicine, Univ. of Campania "L. Vanvitelli", Naples, Italy

Objective: To analyze the role of rapid, nongenomic androgen action in skeletal muscle senescence as well as to investigate how androgen receptor (AR) signaling modulates age-related skeletal muscle mass changes.

Methods: Patients who underwent a primary total hip arthroplasty (THA) or a primary total knee arthroplasty (TKA) were considered eligible. In patients undergoing THA, a modified version of the Herdinge–Baur direct lateral approach was used to collect muscle biopsy from fibers of the gluteus medius. In patients undergoing TKA, a median parapatellar approach was done, and detached fibers from Vastus medialis were collected. We analyzed the expression of the AR in skeletal muscle biopsies and provided co-immunoprecipitation experiments to reveal the role of AR/Filamin A complex in skeletal muscle. To further investigate the effect of androgens on skeletal muscle senescence, we have exposed C2C12 myoblasts to H_2O_2. Finally, in search for a link between AR/FlnA complex and C2C12 cell senescence, we then used a stapled Rh-2025u peptide that specifically perturbs the androgen-induced AR/FlnA complexation.

Results: Twenty patients with a mean age of 63.1 ± 16.6 SD were enrolled. This cohort was split into two groups, young (< 58 y; mean age 46.5), and old (> 58 y; mean age 72.6). Lysate proteins derived from young subjects' (y) biopsies express higher levels of AR, as compared with older subjects (os). Moreover, a significant negative correlation between AR expression and age ($r = -0.7979$; $p < 0.0001$) was reported. Moreover, 75% and 25% of patients under 58 or over 70 y, respectively, exhibit the AR/Fln A complex association. Androgen pretreatment of cells prevents increases in multinucleated C2C12 fraction (i.e., a hallmark of cell senescence). These cells express a robust amount of the AR that undergoes Filamin A complexation upon androgen stimulation. Once assembled, such a complex prevents the senescence induced by oxidative stress in C2C12 cells. Moreover, the addition of the Rh-2025u stapled peptide, which specifically perturbs the AR/FlnA complex assembly, rescues the senescent phenotype even in the absence of oxidative stress, pointing to the critical role of this complex in muscle cell functions.

Conclusion: Our study provides new clues that entangle the role of the androgen-induced AR/FlnA complex assembly in skeletal muscle senescence. Findings in C2C12 cells and muscle biopsies from young or old subjects make the AR/FlnA complex a molecular signature for skeletal muscle health. Taken together, these findings suggest that specific perturbation of AR/FlnA complex assembly impairs the androgen effect and commits the cells towards senescence. Overall, our data indicate that FlnA has a permissive role in muscle cell trophism and strongly cooperates with AR in sustaining the androgen action on the health and wellbeing of skeletal muscle. Tracking and decoding the AR/FlnA complex might provide new hints for the identification of therapeutic candidates in sarcopenia, osteosarcopenia, and frailty.

P217
CLINICAL EVALUATION OF OSTEOPOROSIS IN A COHORT OF PATIENTS WITH EATING DISORDERS IN A THIRD LEVEL HOSPITAL

V. Siles-Guerrero[1], M. Novo-Rodriguez[1], A. Muñoz-Garach[1], I. Herrera-Montes[1], C. Novo-Rodriguez[1]

[1]Universitary Hospital Virgen de las Nieves, Granada, Spain

Objective: Osteoporosis is a relevant complication in patients with eating disorders as it affects a critical stage of skeletal development. The BMD is low and mainly trabecular bone is affected and is not always evaluated and will delay diagnosis. Duration of amenorrhea and malnutrition are related poor prognostic factors. Our aim was to analyse bone health, nutritional status and treatment received in a cohort of patients treated in a multidisciplinary unit for treating eating disorders.

Methods: We performed a descriptive observational study of a sample of 17 subjects admitted to our unit from 01/01/2022 to 01/01/2024. We studied analytical and nutritional parameters, DXA and treatment options. Statistical analysis was performed with SPSS.
Results: In our sample of patients, 91.66% were women, with mean age 31 ± 13.9 SD. Mean BMI was 15.4 ± 1.5 kg/m^2. 100% were diagnosed as anorexia nervosa. All our patients were on fertile age and had amenorrhea with a mean duration of 46 ± 44.1 SD months. Normal BMD was observed in 11.7%. Osteopenia (measured in lumbar spine, femoral neck or both) was found in 41.2% and osteoporosis (measured in same locations) appeared in 47.1%. In this last subgroup the mean Z-score in femoral neck was − 2.51 ± 0.82 SD and lumbar spine − 3.36 ± 0.79 SD and the BMD in femoral neck was 0.62 ± 0.12 g/cm^2 and lumbar spine 0.77 ± 0.13 g/cm^2. 100% of the patients, regardless of the DXA scores, received supplementation with calcium and vitamin D. 60% of the women with abnormal DXA received estrogen treatment, specifically when the amenorrhea was longer than 1 year. 62.5% of patients with osteoporosis diagnosis received antiosteoporotic treatment (40% risedronate and 60% teriparatide).
Conclusion: Low bone mass was frequently observed in our patients with eating disorders. It is underdiagnosed and probably undertreated due to lack of robust evidence of how best to predict and decrease future fracture risk. For this reason, it is essential to protocolize the monitoring of BMD considering that the current bases of treatment are renutrition, recovery of the menstrual cycle, supplementation with calcium and vitamin D and the establishment of antiosteoporotic treatment when necessary.

P218
OSTEOPOROSIS: A MANAGEMENT PROBLEM IN RHEUMATOID ARTHRITIS

A. Nistor[1], L. Groppa[1], E. Russu[1], L. Chişlari[1]

[1]"Nicolae Testemitanu" State Medical and Pharmaceutical Univ., Chisinau, Moldova

Objective: In recent years, researchers have been particularly interested in secondary osteoporosis (OP), which can develop at any age, in both men and women, and is a complication of many diseases, especially rheumatic diseases. However, the mechanisms of osteoporosis in rheumatoid arthritis (RA) are not well understood and disclosed. This is a comprehensive study of general and local regulators of bone tissue remodeling in RA patients, determination of the clinical and pathogenetic significance of the identified disorders.
Results: A decrease in BMD < -ISD according to the T-test (4.25 ± 0.78, $p < 0.01$) was found in a significant part of the examined RA patients (79.3%). It was shown that in menopausal patients and in those taking glucocorticosteroid hormonal drugs, this decrease was more significant (5.1 ± 0.41, $p < 0.01$). The L1-L3 section turned out to be the most informative in terms of diagnosing OP, which indicates the susceptibility of the trabecular part of the skeleton to the resorption process. The role of level disorders has been revealed pro-inflammatory cytokines—IL-1 and TNF, a decrease in the level of IL-2 cellular response regulator, initiating a disorder of bone metabolism, contributing to the manifestation of OP.
Conclusion: Osteoporosis was detected in 79.3% of the examined patients with RA. OP occurs 2 times more often in patients with RA than in controls. The obtained correlations between the content of interleukins in blood serum and the data of BMD and C-terminal telopeptides indicate their close relationship with the pathogenesis of the inflammatory process and bone resorption in patients with RA.

P219
EVALUATION OF STRUCTURE AND CAUSES FOR SWITCHING BDMARDS AND JAK INHIBITORS IN PATIENTS WITH RHEUMATOID ARTHRITIS

A. O. Bobkova[1], A. S. Potapova[1], P. A. Sholkina[1], A. E. Karateev[1], E. Y. U. Polishchuk[1], A. M. Lila[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To estimate the structure of bDMARDs and tsDMARDs in patients with rheumatoid arthritis (RA) as well as the reasons for changing this treatment.
Methods: A retrospective analysis of the therapy structure of bDMARDs and JAK inhibitors was performed in 591 RA patients with moderate or high disease activity (DAS28-CRP ≥ 3.2) and previous ineffectiveness of DMARDs. The most of them were women (83.1%), mean age 50.9 ± 14.1 y, average duration of disease 9 [5;16] y, RF positive 455 (77.1%) patients, ACPA positive 408 (69.0%) patients, DAS28-CRP 4.7 ± 1.0.
Results: Out of 591 patients with moderate and high activity RA, 441 (74.6%) patients had previously received bDMARDs or JAK inhibitors. Thus, the first line b/tsDMARD in the medical history was RTX—43.8%, TNFα inhibitors—38.9%, IL-6 inhibitors—7%, T-lymphocyte costimulation inhibitors—6.3%, JAK inhibitors—4.5%. Treatment was changed in 62.6% of cases (due to treatment failure—17.9%, adverse reactions—7.7%, nonmedical reasons—37%). The second biological drug was prescribed to 149 patients: TNFα inhibitors—41%, RTX—36.2%, IL-6 inhibitors—14%, T-lymphocyte costimulation inhibitor—6%, JAK inhibitors—12.8%. The leading reasons for switching b/tsDMARDs were treatment failure—32%, adverse reactions—7.4%, and nonmedical reasons—15.4%. A third line b/tsDMARD was received by 63 patients: TNFα inhibitors—38%, RTX—27%, IL-6 inhibitors—9.5%, T-lymphocyte costimulation inhibitor—7.9%, JAK inhibitors—17.5%. The structure of the reasons for switching third line biological therapy was similar to the data on second line b/tsDMARD: treatment failure—38%, adverse reactions—6.3%, nonmedical reasons—11.1%. Fourth line b/tsDMARD was administered in 28 patients: TNFα inhibitors 25%, RTX—10.7%, IL-6 inhibitors—28.6%, T-lymphocyte costimulation inhibitor—3.6%, and JAK inhibitors—32.1%, with an ineffectiveness in 46.7%, adverse reactions in 33.3%, and withdrawal for nonmedical reasons in 20% of cases. Finally, fifth line b/tsDMARDs were prescribed to 13 patients.
Conclusion: Five lines of b/tsDMARD were identified in our cohort of patients. In the structure of b/tsDMARDs TNFα and RTX placed the leading position as the first and second lines and a significant number of patients received JAK inhibitors as the fourth line. It is important to note that among the causes for switching first line b/tsDMARD, a large proportion are nonmedical reasons, and the causes for switching third and fourth line are treatment failure.

P220
SURVIVAL ANALYSIS OF BIOLOGICAL DMARDS AND JAK INHIBITORS IN RHEUMATOID ARTHRITIS PATIENTS REQUIRING SWITCHING OF TREATMENT

A. O. Bobkova[1], S. I. Glukhova[1], A. E. Karateev[1], A. S. Potapova[1], A. M. Lila[2]

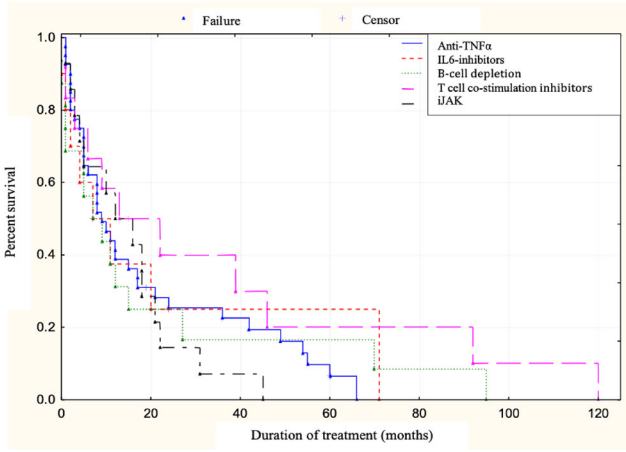
[1]V.A. Nasonova Research Institute of Rheumatology, [2]V.A. Nasonova Research Institute of Rheumatology, Dept. of Rheumatology Russian Medical Academy of Continuing Professional Education, Ministry of Health of Russia, Moscow, Russia

Objective: Approximately 40% of rheumatoid arthritis (RA) patients may respond inadequately to an initial biological treatment because of

primary nonresponse, loss of response, or intolerance. Following inadequate response to first line biological DMARDs (bDMARDs): anti-TNFs), IL-6 inhibitors, B-cell depletion agents, and T-cell costimulation inhibitors or Janus kinase inhibitors (iJAK), clinicians can consider switching to targeted drug with a different mechanism of action. This, in turn, may lead to an increase in refractory disease, which has been defined as difficult-to-treat RA (D2T) by EULAR in 2021. We aimed to evaluate the survival rates first bDMARDS and iJAK in RA patients requiring biologic therapy switching.

Methods: Between October 2022 and September 2023, 315 patients with a confirmed RA and treated with bDMARDs or iJAK were analyzed. There were 93 patients (29.5%), required switching (changing bDMARDs or iJAK to another drug class) due to nonresponse, adverse effect or intolerance therefore, all patients in the observed group finished treatment. The majority were women 86%, mean age 48 ± 13 y, median disease duration 11 [6; 17] y. The examined patients have RF-positive 71 (76%), ACPA-positive 66 (71%) tests, DAS28-ESR—5.9 ± 1.1, pain severity (VAS 100-mm) 67 ± 12. Among the 93 patients: 50 patients (53.8%) had first switching; 43 patients (46.2%) met D2T. The Kaplan–Meier estimator (Figure) was used to survival analysis of the first bDMARDs or iJAK. Patients were divided into 5 groups according to the mechanism of action of the drug. Whereby anti-TNFα group was 41 patients (44%), IL-6 inhibitors—10 patients (11%), B-cell depletion—16 patients (17%), T-cell costimulation inhibitor—12 patients (13%), iJAK—14 patients (15%).

Results: The obtained plot (Figure) shows that in our group of patients the longest duration of therapy was with T-cell costimulation inhibitors (120 months), a little less with B-cell depletion therapy. The median survival rate (in months) was anti-TNFα group—8,7 months, IL-6 inhibitors—7 months, B-cell depletion—7 months, T-cell costimulation inhibitor—13 months, iJAK—12 months. However, the median survival of therapy was not statistically different ($p > 0.05$) in the observed groups, which may indirectly indicate comparable efficacy of all classes of drugs. Regarding the distribution, most patients received anti-TNFα as first-line therapy.



Conclusion: Thus, all classes of bDMARDs and iJAK have comparable survival in our RA cohort, so a personalized approach to therapy selection is required. Consequently, switching to another drug class may be an effective treatment strategy.

P221
PREVALENCE OF OSTEOSARCOPENIA IN POPULATION AGED 50 YEARS AND OVER IN IRAN: THE RESULTS OF IRANIAN MULTICENTER OSTEOPOROSIS STUDY (IMOS)

A. Ghazbani[1], A. Aghakhani[1], N. Fahimfar[1], K. Khalagi[2], M. J. Mansourzadeh[1], M. Sanjari[1], N. Ostovar[3], F. Razi[4], F. Hajivalizadeh[5], K. Etemad[6], E. Hesari[1], S. Hajivalizadeh[1], G. Shafiee[7], R. Heshmat[7], N. Panahi[8], A. Ostovar[9]

[1]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [2]Obesity and Eating Habits Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [3]Food and Beverage Safety Research Center, Urmia Univ. of Medical Sciences, Urmia, [4]Metabolomics and Genomics Research Center, Endocrinology and Metabolism Molecular-Cellular Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [5]Center for Non-Communicable Disease Control & Prevention, Deputy of Public Health, Ministry of Health and Medical Education, Tehran, [6]Safety Promotion and Injury Prevention Research Center, Shahid Beheshti Univ. of Medical Sciences, Tehran, [7]Chronic Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [8]Metabolic Disorders Research Center, Endocrinology and Metabolism Molecular-Cellular Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [9]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran.

Objective: Osteosarcopenia is a pathological state characterized by the concurrent decline in bone mass, indicated by osteoporosis or osteopenia, and the reduction in muscle mass and strength, known as sarcopenia. This study investigated the prevalence of osteosarcopenia in the population aged ≥ 50 y in Iran.

Methods: This study utilized samples from the Iranian Multicenter Osteoporosis Study (IMOS-2021). Individuals aged ≥ 50 y who participated in the IMOS, completed clinical and physical examinations. BMD and skeletal muscle mass were measured using DXA according to the standard protocol using HOLOGIC (Discovery and Horizon) devices. A BMD T-score of − 2.5 or lower and between − 1 and − 2.5 at either spinal, femoral neck or total hip sites were defined as osteoporosis and osteopenia, respectively. According to the EWGSOP-2 and AWGS, sarcopenia was detected by the presence of low muscle mass with low muscle strength in which was measured by handgrip strength, using a digital dynamometer. Subsequently, osteosarcopenia was characterized as the coexistence of osteopenia or osteoporosis, along with sarcopenia. The survey set analysis was carried out using the STATA statistical software, with the objective of determining the weighted prevalence of osteosarcopenia among adults in Iran.

Results: Overall, 1440 participants (54.4% women) with the mean age of 60.7 ± 8.0 y were included. Our results indicated that 8.7% (95% CI 7.2–10.5%) of participants had osteosarcopenia. The weighted prevalence of osteosarcopenia was 9.1% (95% CI 7.1–11.5%) in women and 8.3% (95% CI 6.2–11.1%) in men. The weighted prevalence of osteosarcopenia did not exhibit a statistically significant distinction between individuals residing in rural areas (7.6%, 95% CI 5.2–11.2%) and those living in urban areas (9.1%, 95% CI 7.3–11.2%). Considering the age range, the statistical analysis revealed a significant difference in the weighted prevalence of osteosarcopenia between individuals aged ≥ 65 y [16.8% (13.0–21.5%)] and aged < 65 y [5.4% (4.1–7.0%)].

Conclusion: Our results showed a relatively high prevalence of osteosarcopenia, particularly among individuals aged 65 y and older in Iran. Given the rapid expansion of the elderly demographic in Iran, it is anticipated that this matter will increasingly pose a significant public health challenge in the near future.

P222
PREVALENCE OF LOW BONE MASS IN MEN AND WOMEN AGED ≥ 50 YEARS OLD IN IRAN: KEY FINDINGS FROM THE IRANIAN MULTICENTER OSTEOPOROSIS STUDY (IMOS)

E. Hesari[1], K. Khalagi[2], N. Fahimfar[1], M. J. Mansourzadeh[1], A. Aghakhani[1], M. Sanjari[1], F. Hajivalizadeh[3], S. Hajivalizadeh[1], G. Shafiee[4], R. Heshmat[4], F. Farzadfar[5], F. Razi[6], N. Panahi[7], A. Raeisi[8], B. Larijani[9], A. Ostovar[1]

[1]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [2]Obesity and Eating Habits Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [3]Center for Non-Communicable Disease Control & Prevention, Deputy of Public Health, Ministry of Health and Medical Education, [4]Chronic Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, [5]Non-Communicable Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, [6]Metabolomics and Genomics Research Center, Endocrinology and Metabolism Molecular-Cellular Sciences Institute, Tehran Univ. of Medical Sciences, [7]Metabolic Disorders Research Center, Endocrinology and Metabolism Molecular-Cellular Sciences Institute, Tehran Univ. of Medical Sciences, [8]Dept. of Internal Medicine, Tehran Univ. of Medical Sciences, [9]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Iran has a rapidly aging population and a growing prevalence of geriatric syndromes. To estimate the prevalence of osteopenia and osteoporosis in a nationally representative, population-based study, we utilized data from the 4th round of the Iranian Multicenter Osteoporosis Study (IMOS-4), conducted in 2022.
Methods: The study employed a multistage, cluster random sampling method to select individuals aged 50 y and older from both urban and rural areas. BMD was measured in all participants by a trained operator using standard, calibrated Hologic DXA machines. A BMD T-score of − 2.5 or lower and between − 1 and − 2.5 at either spinal, femoral neck or total hip sites were defined as osteoporosis and osteopenia, respectively. We applied weights to account for sampling design, nonresponse, and poststratification to estimate the prevalence of osteoporosis and osteopenia by sex, age group and the area of residence.
Results: A total of 1435 individuals participated in the study, of which, 751(52.3%) were women. Total prevalence of osteopenia and osteoporosis were 48.7% (95% CI 45.7–51.7) and 31.1% (95% CI 28.4–33.9), respectively. The prevalence of osteoporosis was 23.6% (95% CI 19.9–27.5) and 37.4% (95% CI 33.6–41.4) among men and women ($P < 0.001$), 38% and 28.7% among rural and urban residents ($P = 0.010$), and 23.7% (95% CI 20.7–26.8) and 48.6% (95% CI 43.2–54.1) among those aged 50–65 and ≥ 65 years old ($P < 0.001$).
Conclusion: The prevalence of low bone mass in Iran is quite high, particularly among women, rural residents, and older individuals. Considering the rapid growth of the elderly population in Iran, this issue is expected to become a bigger public health concern in the near future.

P223
THE ASSOCIATION BETWEEN POOR NUTRITION AND OSTEOPOROSIS IN AN IRANIAN ELDERLY POPULATION: BUSHEHR ELDERLY HEALTH (BEH) PROGRAM

N. Fahimfar[1], A. Jamshidi[2], E. Madreseh[3], K. Khalagi[4], M. J. Mansourzadeh[1], M. Sanjari[1], G. Shafiee[5], I. Nabipour[6], H. Aghaei Meybodi[7], A. Farhadi[2], E. Hesari[1], S. Hajivalizadeh[1], N. Ostovar[8], B. Larijani[9], A. Ostovar[1]

[1]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [2]The Persian Gulf Tropical Medicine Research Center, The Persian Gulf Biomedical Sciences Research Institute, Bushehr Univ. of Medical Sciences, Bushehr, [3]Dept. of Epidemiology and Biostatistics, School of Public Health, Tehran Univ. of Medical Sciences, Tehran, [4]Obesity and Eating Habits Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [5]Chronic Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [6]The Persian Gulf Marine Biotechnology Research Center, the Persian Gulf Biomedical Sciences Research Institute, Bushehr Univ. of Medical Sciences, Bushehr, [7]Evidence Based Medicine Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [8]Food and Beverage Safety Research Center, Urmia Univ. of Medical Sciences, Urmia, [9]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Osteoporosis is characterized by the degradation of bone microstructures, resulting in an increased risk of fragility fractures. The risk factors for osteoporosis can be categorized as either modifiable or non-modifiable. The adoption of healthy lifestyle habits is widely recognized as a crucial modifiable factor in promoting optimal bone growth and healthy aging. The present study aims to assess the relationship between nutritional status, and the risk of osteoporosis in Iranian older adults.
Methods: The second stage of the BEH program provided the data for the current cross-sectional analysis. Nutritional assessment was assessed using the Mini Nutrition Assessment (MNA) and reported as mean ± standard deviations (SD). Considering the cutoff points of ≥ 24, the individuals were categorized as well nourished and poorly nourished. BMD was measured using DXA. Osteoporosis was described as having a BMD ≥ 2.5 (SD) below the average value of young Caucasian women, aged 20–29 y in either femoral neck, spinal, and total hip. Logistic regression model was used to investigate the association between nutritional status and osteoporosis, considering the other potential confounders.
Results: In all, 2419 (1165 men) participants aged ≥ 60 y were included. There were significant differences in MNA score between osteoporotic patients (23.1 ± 5.1) and participants with osteopenia (24.1 ± 5.0), and with healthy individuals (24.4 ± 5.26), both Ps < 0.001. Poor nutrition was associated to osteoporosis (OR: 1.25, 95% CI 1.01–1.55, P = 0.035), adjusted for potential confounders. Factors such as age (OR: 1.05, $p < 0.001$), fractures after age 45 y (OR: 1.95, $P < 0.001$), female sex (OR: 6.32, $P < 0.001$), drug abuse (OR: 2.05, $P = 0.029$), low physical activity (OR: 1.67, $P = 0.018$), polypharmacy ≥ 5 drugs (OR: 1.39, $P = 0.21$), cognitive disorders (OR: 1.53, $P < 0.001$), and disability (OR: 1.32, $P = 0.019$) were also associated with osteoporosis. BMI (OR: 0.89, $P < 0.001$), years of schooling (OR: 0.96, $P < 0.001$), and diabetes (OR: 0.58, $P < 0.001$) showed inverse association with osteoporosis.
Conclusion: Our research indicates the positive association of poor nutrition with osteoporosis, adjusted by the traditional risk factors.

Considering the growing number of elderly populations in the country, it seems necessary to have appropriate interventions to improve the nutritional status of the elderly.

P224
IS THERE A RELATIONSHIP BETWEEN BONE TURNOVER AND INSULIN RESISTANCE? EVALUATION OF AN OSTEOPOROTIC POPULATION TREATED WITH DENOSUMAB

A. P. Barbosa[1], I. Cosme[1], J. V. Rocha[1], F. Costa[1], E. Alves[1], F. Sampaio[1]

[1]Multidisciplinary Fracturary Osteoporosis Outpatient Clinic, Hospital Santa Maria, Lisboa, Portugal

Objective: Denosumab (Dmab), a monoclonal antibody against RANKL is a potent antiresorptive drug used to treat osteoporosis and osteoporotic fractures. Some studies have pointed to an association between RANKL/RANK signaling pathway and energy metabolism, and the downregulation of RANKL signaling seems to improve hepatic insulin sensitivity and glucose metabolism in both mice and humans. We aimed to evaluate the effects of Dmab on bone remodeling markers and on the glucose and insulin metabolism and to study the possible associations between bone turnover and glucose/insulin resistance.
Methods: Retrospective study of patients with severe osteoporosis, treated at least 6 months with Dmab. Bone remodeling markers (CTX, P1NP, BAP, osteocalcin) and fasting insulin and glucose were analysed before (T0) and after (T1) Dmab treatment. HOMA-IR (fasting insulin mcU/ml $\times$ fasting glucose mmol/l/22.5) was calculated in T0 and T1. Adequate statistical tests were used and $P < 0.05$ was considered significant.
Results: 22 patients (19 women), 75.7 $\pm$ 9.8 years old, treated with Dmab during 20.8 $\pm$ 10.6 months. Three had type 2 diabetes (DM2). The results of bone markers in T0/T1 were, respectively: P1NP 43.2 $\pm$ 17.5/21.4 $\pm$ 9.7 ng/ml ($P < 0.01$); CTX 0.4 $\pm$ 0.2/0.1 $\pm$ 0.1 ng/ml ($P < 0.01$); osteocalcin 19.8 $\pm$ 8.6/10.5 $\pm$ 4 ng/ml ($P < 0.01$); BAP 12.8 $\pm$ 5.7/8 $\pm$ 1.9 μg/l ($P < 0.01$). That corresponds to decreases of: P1NP 49.5%, CTX 25%, osteocalcin 53%, BAP 62.5%. Regarding glucose metabolism in T0/T1, the reductions were, respectively: glucose (98 $\pm$ 22.1/94.2 $\pm$ 18 mg/dl; P = 0.1), insulin (14.9 $\pm$ 22.1/11.3 $\pm$ 9.7 μU/ml; P = 0.4) and HOMA-IR (3.9 $\pm$ 6.3/2.8 $\pm$ 2.9; P = 0.4). There were no significant correlations between glucose, insulin and the bone markers in T0 and T1 in both diabetics and nondiabetics.
Conclusion: In this group of patients with severe osteoporosis, Dmab reduced bone turnover markers and simultaneously glucose and insulin resistance. This anti-osteoporotic treatment can also be useful in the prevention/treatment of DM2.

P225
BODY COMPOSITION AND CALCIUM METABOLISM IN POSTMENOPAUSAL TYPE 2 DIABETIC WOMEN

A. P. Barbosa[1], B. Dalpizol[2], L. Aguiar[2], J. Ferreira[2], M. R. Mascarenhas[3], M. Bicho[2], A. Inácio[2]

[1]CEDML-Endocrinology, Diabetes and Metabolism Clinic of Lisbon, [2]Genetics Laboratory, Faculty of Medicine, Lisbon Univ., [3]Environmental Health Institute, Associate Laboratory TERRA, Faculty of Medicine, Lisbon Univ., Lisbon, Portugal

Objective: Diabetic bone disease has been described as a complex chronic complication of people with type 2 diabetes (DM2) because it is associated to osteoporotic fractures, but not with increased bone turnover markers nor reduced BMD. So, its pathogenesis is still in debate and it seems that bone quality can be compromised. We aimed to evaluate the BMD, the bone turnover markers, and the calcium metabolism parameters in a DM2 population by comparison with a population without the disease.
Methods: A group of 47 DM2 postmenopausal women was compared with a control group (N = 176) of similar age, stature and time since menopause. Anthropometric parameters were evaluated and BMI (kg/m^2) was calculated. BMD (g/cm^2) at L1–L4 and proximal femur and lean and fat masses were analyzed by DXA (QDR Discovery, Hologic). Patients were categorized as normal, low bone mass and osteoporosis according to ISCD criteria. Fasting blood samples were collected for calcium, phosphorus, PTH, 25(OH)-vitamin D, osteocalcin, bone alkaline phosphatase and CTX. Adequate statistical tests were done with SPSS 28 version and statistical significance was considered for $P < 0.05$.
Results: The DM2 group had higher total fat (30.65 vs. 27.56 kg, P = NS) and lean masses (43.44 vs. 41.39 kg, P = 0.04), BMD at the femoral neck (0.838 $\pm$ 0.136 vs. 0.780 $\pm$ 0.128 g/cm^2, P = 0.007) and at the total femur (0.949 $\pm$ 0.137 vs. 0.902 $\pm$ 0.136 g/cm^2, P = 0.04). We found no significant differences between the DM2 and the control group, regarding the levels of: calcium (9.4 vs. 9.4 mg/dL), phosphorus (3.6 vs. 3.5 mg/dL), 25(OH)-vitamin D (17.5 vs. 16.0 ng/mL), osteocalcin (6.5 vs. 8.4 ng/mL), bone alkaline phosphatase (10.0 vs. 11.0 mcg/L), CTX (0.24 vs. 0.29 ng/mL). However, PTH was significantly lower in DM2 (35.4 vs. 48.4 pg/mL, $P < 0.001$). We did not find correlations of PTH with BMD nor with bone markers.
Conclusion: This study shows that this population of DM2 postmenopausal women has not increased bone turnover and has a higher cortical bone mass. We can also hypothesize that the lower PTH levels may play a protective role, reducing the expected increase in the postmenopausal bone resorption.

P226
VITAMIN D STATUS AND SEASONAL VARIATIONS IN SERUM 25-HYDROXYVITAMIN D LEVELS IN CHILDREN WITH CEREBRAL PALSY

A. Halasheuskaya[1], A. Pachkaila[1], E. Rudenka[2]

[1]Institute of Advanced Training and Retraining of Healthcare Personnel of Belarusian State Medical Univ., [2]Belarusian State Medical Univ., Minsk, Belarus

Objective: To assess vitamin D status and seasonal variation in serum 25-hydroxyvitamin D (25(OH)D) levels in children with cerebral palsy (CP).
Methods: The study included 93 patients with CP (41 girls and 52 boys) aged from 2–18 y (median age—9.9 (7.4; 13.1) y) who were examined at the Republican Center for Pediatric Osteoporosis. None of the patients had previously received vitamin D supplementation. 47 (50.5%) of all children were ambulatory (GMFCS levels I-III), 46 (49.5%) of all children were nonambulatory (GMFCS levels IV–V). 37 (39.8%) of all children were taking antiepileptic drugs. The level of 25(OH)D was determined by electrochemiluminescence. Vitamin D status was assessed according to international recommendations: normal if 25(OH)D $\geq$ 30 ng/ml, insufficiency—20–29 ng/ml, deficiency— $<$ 20 ng/ml, and severe deficiency— $<$ 10 ng/ml.
Results: The median 25(OH)D level was 16.2 (11.2, 19.8) ng/ml (range 2.3–44.3 ng/ml). Severe deficiency, deficiency and insufficiency of vitamin D were detected in 16.1%, 59.2% and 17.2% of children, respectively (total—92.5%). There were no significant differences in 25(OH)D levels among patients based on their age, gender, ambulation, or history of anticonvulsant drug use. Comparison of vitamin D levels in different seasons showed that the highest median serum 25(OH)D level was found in summer (20.2 (15.7; 28.9)

ng/ml), and the lowest one was in winter (12.1 (8.8; 16.8) ng/ml), ($p < 0.001$). The median values of 25(OH)D in spring and autumn did not differ significantly ($p > 0.05$) and were 16.0 (11.3; 18.1) ng/ml and 15.9 (11.5; 21.4) ng/ml, respectively. The prevalence of vitamin D deficiency and insufficiency was 100% in winter, 96.4% in autumn, 90.9% in spring, 80% in summer.

Conclusion: The results of our study revealed a high prevalence of vitamin D deficiency and insufficiency and significant seasonal variations in serum 25(OH)D levels in children with cerebral palsy who did not receive vitamin D supplementation. The obtained data determine the need to optimize measures to prevent vitamin D deficiency in children with CP.

P227
MELORHEOSTOSIS: A RARE SCLEROSING BONE DYSPLASIA

A. Halasheuskaya[1], A. Pachkaila[1], V. Vadzianava[1]

[1]Institute of Advanced Training and Retraining of Healthcare Personnel of Belarusian State Medical Univ., Minsk, Belarus

We present a case of a rare skeletal dysplasia. Melorheostosis is a rare sclerosing bone dysplasia that affects both cortical bone and adjacent soft tissue structures in a sclerotomal distribution.

Casereport: We present a case of melorheostosis in an 8-year-old boy with scleroderma-like skin lesions at the onset of the disease and a description of the dynamics of the disease over the next 10 y of observation. From the age of 6 y the patient had a scleroderma-like skin lesion in the area of the right thigh. At the age of 7 (after an injury) deformity of the second toe of the right foot appeared, and even later–slight hardening and swelling of the tissues of the right thigh, discrepancy in the length of the lower extremities and compensatory scoliosis. At 8 y of age radiography of the pelvis and lower extremities demonstrated the presence of extensive, irregular endosteal hyperostosis in the diaphyses of the right femur and right tibia. The diagnosis was verified: Melorheostosis, polyostotic form. Since the age of 10 he was periodically bothered by unexpressed pain in the right lower limb, limited range of motion in the right knee joint, shortening of the affected limb by up to 3 cm, compensatory lameness and compensatory right-sided thoracolumbar scoliosis. The patient received conservative treatment: NSAIDs (for pain relief), physiotherapeutic treatment, physical therapy, massage. Further observation showed a gradual and steady progression of the radiological manifestations of the disease. By the age of 18 the patient had spread of the melorheostotic lesion to the pelvic bones with the formation of secondary coxarthrosis of the right hip joint, grade 3.

Conclusion: The dynamics of the development of the disease in the patient in the presented clinical case indicates a gradual, steady progression of clinical and radiological manifestations of melorheostosis over time. There is currently no effective specific treatment for the described skeletal dysplasia. The used treatment is symptomatic and requires the participation of a multidisciplinary team of specialists.

P228
THE ICARE FEASIBILITY STUDY: AN INTEGRATED COLLECTION OF EDUCATION MODULES FOR FALL AND FRACTURE PREVENTION FOR HEALTHCARE PROVIDERS IN LONG TERM CARE

A. Papaioannou[1], G. Ioannidis[1], L. Hillier[2], J. D. Adachi[1], A. Costa[3], G. Heckman[4], J. Hirdes[4], J. Holroyd-Leduc[5], S. Jaglal[6], S. Kaasalainen[7], A. Lau[1], C. Mcarthur[8], L. Kane[1], S. Marr[9], S. Straus[10], J.-E. Tarride[3], L. Thabane[1], M. Abbas[11], I. Rodrigues[12]

[1]McMaster Univ., Dept. of Medicine, Hamilton, [2]Geras Centre for Aging Research, Hamilton, [3]McMaster Univ., Dept. of Health Research Methods, Hamilton, [4]Univ. of Waterloo, School of Public Health Sciences, Waterloo, [5]Univ. of Calgary, Dept. of Medicine and Community Health Sciences, Calgary, [6]Univ. of Toronto, Dept. of Physical Therapy, Toronto, [7]McMaster Univ., School of Nursing, Hamilton, [8]Dalhousie Univ., School of Physiotherapy, Halifax, [9]Unity Health Toronto, Hamilton, [10]McMaster Univ., Unity Health Toronto, Hamilton, [11]McMaster Univ., Hamilton, [12]Univ. of Manitoba, Max Rady College of Medicine, Winnipeg, Canada

Objective: To determine the feasibility (recruitment rate and adaptations), with a subobjective to understand facilitators to and barriers of, implementing the PREVENT (Person-centred Routine Fracture PreEVENTion) model in practice. The model includes a multifactorial intervention on improving diet, exercise, environmental adaptations, hip protectors, osteoporosis medications, and medication reviews to treat residents at high risk of fracture. Our secondary outcomes were to determine if there was a change in knowledge uptake and in the proportion of fracture prevention prescriptions post-intervention.

Methods: We conducted a mixed methods longitudinal cohort study in three LTC homes across Ontario. A local champion was selected to guide the implementation of the model and promote best practices. We reported recruitment rates using descriptive statistics and implementation process using content analysis.

Results: Within 5 months, we recruited one for-profit and two not-for profit LTC homes, Home A (120 beds), Home B (425 beds), and Home C (240 beds) and one local champion from each home. We required two months to identify and train the local champion over three 1.5-h train-the-trainer sessions, and the local champion required three months to deliver the intervention to a team of healthcare professionals. Forty healthcare professionals across three LTC homes participated and 88% received education on the LTC recommendations. Homes A, B and C reported increases in the proportion of osteoporosis medication by 62%, 3%, and 42%, respectively before and after intervention. At baseline, 57% of LTC residents are at high risk for fracture, and 17% of these high risk residents are on osteoporosis medications. Benefits of the model include easy access to the Fracture Risk Scale, clear and succinct educational material, and an accredited continuing medication educational module for physicians. Challenges included misperceptions between the differences in fall and fracture prevention strategies and fear of perceived side effects associated with fracture prevention medications.

Conclusion: Our study found an increase in knowledge uptake and the proportion of fracture prevention prescriptions post-intervention. The next steps will be to determine if the adapted PREVENT model reduces the risk and rate of hip fractures in LTC.

P229
WHAT IS THE BEST TREATMENT OPTION FOR OSTEOPOROSIS IN YOUNG WOMEN WITH A HISTORY OF GYNECOLOGICAL CANCER? A SYSTEMATIC REVIEW

A. V. Gueldini[1], L. Costa-Paiva[1], A. Pedro[1]

[1]Univ. of Campinas, Campinas, Brazil

Objective: To evaluate the best treatment option for osteoporosis in young women with a history of gynecological cancer.

Methods: The present systematic review was carried out using the keywords 'gynecological cancer' and 'young women' and 'osteoporosis treatment'; keywords were combined with Boolean operators. Breast cancer survivors were excluded. Eligible studies were identified by a systematic literature search of PubMed, Cochrane Library,

Web of Science, Embase, and Scopus with no language or date restriction up to 25 January 2024. To be included in this systematic review, eligible studies had to be randomized clinical trials (RCTs) and nonrandomized studies of intervention comparing osteoporosis outcomes of women who had gynecological cancer underwent osteoporosis treatments compared to patients not exposed to these strategies.
Results: From 656 articles, 7 studies were included for qualitative analysis. Not all studies had a matching criterion or the same design between the study population and the controls, and these criteria often differed between studies. In addition, there is no trial comparing different types of medication treatment (hormone replacement therapy vs. bisphosphonates or denosumab) with the worst outcome in this population, the occurrence of fragility fractures.
Conclusion: Our results showed that there is a gap in the literature on what would be the best treatment option for osteoporosis in young women who are survivors of any type of gynecological cancer. Therefore, during the treatment of gynecological cancer, strategies should be implemented to mitigate these risks. The risk of bone density loss and osteoporosis in gynecological cancer should be recognized, prevented, and diagnosed early to reduce the incidence of osteoporotic fractures. Proper calcium and vitamin D intake, outdoor activity recommendations, and regular BMD measurements may improve the quality of life of gynecological cancer patients. In addition, larger scale prospective studies should be carried out to investigate the factors that affect the long-term, as well as the short-term effects of osteoporosis treatment in gynecological cancer patients.

P230
IMPACT OF FALL-RISK INCREASING DRUGS (FRIDS) ON FALL RISK, FEAR OF FALLING, AND FALLS IN OLDER ADULTS

A. Pereira[1], P. Pires[1], J. Costa[2], M. Veríssimo[3], O. Ribeiro[1]

[1]Cintesis-Center for Health Technology and Services Research, Dept. of Education and Psychology, Univ. of Aveiro, Aveiro, [2]Research Center in Physical Activity, Health and Leisure, Faculty of Sport, Univ. of Porto, Porto, [3]Faculty of Medicine, Univ. of Coimbra, Coimbra, Portugal

Objective: Deprescribing fall-risk-increasing drugs (FRIDs) is part of multifactorial fall prevention strategies for older adults. This study explores the relationship between FRIDs and fall-related outcomes in older adults.
Methods: Cross-sectional study of 509 community-dwelling older adults (mean age = 76.0 y, SD = 6.8), data collection including demographic and clinical characteristics, falls history, fear of falling using the Fall Efficacy Scale (FES-I) and basic functionality using the Timed Up and Go test (TUG). Statistical analyses employed chi-square tests, Mann–Whitney and Kruskal–Wallis tests, Student's T-test, and ANOVA with a significance level of 5%.
Results: 24.6% of participants experienced falls the previous year, and 26.2% exhibited a high fall risk (TUG). Fear of falling (FES-I) was high in 44.8% of participants. Most (73.1%) used at least one FRID, with 43.4% taking one, 19.8% taking two, and 9.9% taking three or more. Common FRIDs included diuretics (41.2%), benzodiazepines (23.4%), and antidepressants (18.7%). Notably, 29.1% of men used alpha-blockers for prostate hyperplasia. High fall risk was prevalent in those using benzodiazepines (32.8 vs. 24.2%, $p = 0.042$), antiepileptics (45.0 vs. 25.4%, $p = 0.050$), opioids (40.5 vs. 25.1%, $p = 0.034$), and high ceiling diuretics (56.9 vs. 22.8%, $p < 0.001$). A significant association existed between the number of FRIDs and high fall risk ($p = 0.005$). No significant association was found between FRID use and falls in the last year. Higher fear of falling was associated with antipsychotics, antidepressants, opioids, and diuretics, with increasing fear tied to a higher number of drugs ($p = 0.011$).
Conclusion: This study highlights the intricate association between FRIDs and an increased fall risk and fear of falling in older adults. Understanding these associations is vital for targeted deprescribing interventions to reduce fall-related outcomes.

P231
INFLUENCE OF CENTRAL SENSITIZATION ON DISEASE ACTIVITY, SEVERITY OF CLINICAL MANIFESTATIONS IN RHEUMATOID ARTHRITIS PATIENTS WITH INITIAL FAILURE OF DMARDS

A. Potapova[1], A. Karateev[1], E. Polishchuk[1], A. Bobkova[1], P. Sholkina[1], E. Filatova[1], A. Lila[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To evaluate the relationship between psychoemotional disturbances, severity of clinical manifestations and presence of central sensitization in rheumatoid arthritis.
Methods: The study group consisted of 509 RA patients (according to the ACR/EULAR 2010 classification criteria) with moderate or high disease activity (DAS28-CRP ≥ 3.2) and insufficient efficacy or intolerance to csDMARDs, biological drugs (bDMARDs), and JAK inhibitors. We used inquirers such as the Central Sensitization Inventory (CSI) questionnaire to identify signs of CS, PainDETECT questionnaire to screening neuropathic pain symptoms (NPS), HADS questionnaire to identify anxiety and depression, HAQ questionnaire to evaluate functional status, FSS questionnaire for fatigue and FIRST questionnaire for signs of fibromyalgia.
Results: Signs of CS (CSI ≥ 40) were detected in 57.2% of the examined patients and median value was 42 [32; 53]. It was found that patients with CS have worse health status (Patient's Global Assessment)—64.6 $\pm$ 13.5 and 53.5 $\pm$ 16.8, $p = 0.001$ respectively) and more prolonged morning stiffness—90 [30; 180] and 60 [20; 120] min., $p = 0.001$, greater number of painful joints—8 [5; 12] and 7 [4; 10], $p = 0.005$, worse functional state according to HAQ (1.65 $\pm$ 0.7 and 1.08 $\pm$ 0.5, $p = 0.001$) and higher disease activity according to DAS28-CRP (4.9 $\pm$ 1.0 and 4.6 $\pm$ 0.9, $p = 0.001$) vs. patients without signs of CS. There was also a clear relationship between CS and a high probability of having NPS (Pain DETECT > 18)—34.5% and 10.3%, $p = 0.001$, clinically significant anxiety and depression (HADS > 11)—29.0% and 5.1%, $p = 0.001$ and 26.3% and 4.2%, $p = 0.001$, respectively, fatigue (FSS)—96.5% and 70.4%, $p = 0.001$, signs of fibromyalgia (FIRST ≥ 5)—38.4% and 6.1%, $p = 0.001$.
Conclusion: The presence of signs of CS in RA significantly affects many symptoms of the disease, being associated with higher pain intensity, fatigue, impaired function, increased incidence of NPS, depression, anxiety and fibromyalgia.

P232
CENTRAL SENSITIZATION (CS) IS A PHENOMENON TO DETERMINE THE PATHOGENESIS OF CHRONIC PAIN, REDUCED RESPONSE TO DMARDS, AND DEVELOPMENT OF DIFFICULT TO TREAT RHEUMATOID ARTHRITIS (RA)

A. Potapova[1], A. Karateev[1], E. Polishchuk[1], A. Bobkova[1], P. Sholkina[1], A. Lila[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To determine the effect of central sensitization on clinical response to biological therapy in RA patients.

Methods: We assessed the presence of CS in 591 patients with moderate or high activity of RA (DAS28-CRP $\geq$ 3.2) using the Central Sensitization Inventory (CSI) questionnaire. The majority were women—83.1%, mean age 50.9 $\pm$ 14.1 y, with previous failure of DMARDs. The examined patients have RF-positive 455 (77.1%), ACPA-positive 408 (69.0%) tests. The average duration of RA in the study group was 9 [5; 16] y, DAS28-CRP—4.7 $\pm$ 1.0, pain severity (VAS) 6 [4; 7], fatigue according to FSS questionnaire ($\geq$ 27)—499 (84.4%), HAQ 1.4 $\pm$ 0.7. Medical history analysis showed, 97.5% of patients received csDMARDs, more often methotrexate—65.7%, less often sulfasalazine—16.9%, hydroxychloroquine—8.5%, and leflunomide—5.2%. Biological drugs were previously received by 74.6% of patients. At the time of inclusion in the study, csDMARDs were taken by 81.8% of patients, bDMARDs—63.1%, and JAK inhibitors—6.2%. More than half of the patients (52.8%) were taking glucocorticoids, all patients were taking NSAIDs. Initially, the result of CSI questionnaire more than 40 (CSI^{3}40) was detected in 56.3%, the median was 42 [32;53]. During hospitalization, patients were prescribed bDMARDs—70.6% (TNFα inhibitors—26.6%, IL6-inhibitors—6.5%, RTX 38.4%) and JAK inhibitors—8.87%, replacement of DMARDS without bDMARDs and JAK—29.4% of patients. The clinical response was assessed by PASS according to the data of telemedicine monitoring after 6 months.
Results: PASS-positive was registered in 57% (65.1% for bDMARDs and JAK inhibitors, 40% for csDMARDs. The presence of CS (CSI $\geq$ 40) was associated with the worst response: PASS-positive—42.3%, PASS-negative—57.7%, (p = 0.001).
Conclusion: The presence of CS significantly reduces the efficacy of therapy with csDMARDs and biological agents. The presence of CS is associated with severer pain, fatigue, and poor quality of life.

P233
REDUCING THE NEED FOR GLUCOCORTICOIDS AGAINST THE BACKGROUND OF THERAPY WITH BDMARDS AND IJAK IN RHEUMATOID ARTHRITIS: REAL CLINICAL PRACTICE

A. Potapova[1], A. Karateev[1], E. Polishchuk[1], A. Bobkova[1], E. Filatova[1], A. Lila[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Clinical guidelines for the treatment of rheumatoid arthritis (RA) recommend reducing the use of glucocorticoids (GCs) due to the high risk of associated complications. We aimed to determine the frequency of GC cancellations and dose reductions in real clinical practice, while taking into account active RA therapy.
Methods: The study group consisted of 303 patients with RA reliable according to ACR/EULAR criteria (women 79.9%, age 52.8 $\pm$ 13.3, disease duration 9 [4; 16] y, DAS28-CRP 4.9 $\pm$ 1.0, RF positive 77.4%, ACCP positive 70.3%), who were prescribed or changed therapy with DMARDs, bDMARDs or iJAK due to disease exacerbation and ineffectiveness of previous treatment. All patients initially received GC (7.7 $\pm$ 3.8 mg/d prednisolone equivalent). After adjustment of therapy, 42.9% of patients received methotrexate, 27.6% leflunomide, 29.5% sulfasalazine, hydroxychloroquine, or a combination with an NSAID, 63.7% bDMARDs, and 7.2% iJAK. The need for GC intake was assessed by a telephone survey conducted 6 months after the start of follow-up.
Results: Telephone survey was possible in 274 persons (90.4%). There was a significant decrease in pain intensity (numerical rating scale, NRS 0–10) from 6.3 $\pm$ 1.4 to 4.3 $\pm$ 2.4 ($p < 0.001$), fatigue (NRS) from 6.7 $\pm$ 2.3 to 5.2 $\pm$ 2.1 ($p < 0.001$), and functional impairment (NRS) from 5.4 $\pm$ 2.1 to 3.9 $\pm$ 2.0 ($p < 0.001$). A positive PASS index (symptom status acceptable to patients) was noted in 139 patients (50.7%). GC cancellation was noted in 19.7%, dose reduction in 25.9%, maintaining the same dose in 42.7%, and dose increase in 11.7%.
Conclusion: Against the background of intensive RA therapy, including combination of DMARDs with bDMARDs or iJAK, complete withdrawal or reduction of GC dose was achieved in less than half of patients (45.6%) after 6 months.

P234
EVALUATION OF VITAMIN D METABOLISM, CALCIUM AND PHOSPHATE HOMEOSTASIS IN PATIENTS WITH CKD5 UNDERGOING HEMODIALYSIS WHEN GIVEN A SINGLE HIGH DOSE (150,000 IU) OF CHOLECALCIFEROL

A. Bondarenko[1], A. Povaliaeva[1], A. Zhukov[1], Z. Zuraeva[1], M. Ovcharov[1], V. Ioutsi[1], E. Pigarova[1], L. Dzeranova[1], Z. Belaya[1], L. Rozhinskaya[1]

[1]Endocrinology Research Centre, Moscow, Russia

Objective: To assess parameters of vitamin D and mineral metabolism and their response to a loading dose of cholecalciferol (150,000 IU) in hemodialysis patients (CKD5D), as compared to healthy individuals.
Methods: Thirty CKD5D patients were compared to 30 healthy volunteers. Serum levels of vitamin D metabolites, free 25(OH)D, vitamin D-binding protein (DBP), PTH, FGF-23, calcium (Ca), albumin and phosphorus (P) were assessed before and 7 d after 150,000 IU cholecalciferol administration. Blood sampling was performed before hemodialysis. Vitamin D metabolites were measured by UPLC-MS/MS.
Results: Initial levels of free 25(OH)D (4.78 [3.88; 5.26] vs. 5.61 [4.01; 7.31] pg/mL), and DBP (280 [229; 320] vs. 265 [242; 293] mg/L) were comparable ($p > 0.05$). The basal level of albumin-corrected Ca (2.11 [2.04; 2.17] vs. 2.30 [2.25; 2.35] mmol/L) was significantly lower, while P (1.56 [1.28; 1.98] vs. 1.19 [1.06; 1.30] mmol/L), PTH (199.5 [105.6; 321.5] vs. 42.4 [36.1; 61.7] pg/mL) and FGF-23 (21.0 [8.9; 27.6] vs. 0.4 [0.3; 0.6] pmol/L) levels were higher in CKD5D patients ($p < 0.05$). CKD5D patients were also characterized by lower levels of 25(OH)D3 (7.1 [3.7; 13.5] vs. 18.2 [12.2; 22.9] ng/mL), 24,25(OH)2D3 (0.05 [0.05; 0.07] vs. 1.33 [0.60; 2.10] ng/mL), and 1,25(OH)2D3 (18 [12; 43] vs. 39 [31; 56] pg/mL) ($p < 0.05$). After the cholecalciferol treatment in a single high dose (150,000 IU) we observed a significant increase in free 25(OH)D, 25(OH)D3 and 24,25(OH)2D3 ($p < 0.05$) within the CKD5D and control group, while 1,25(OH)2D3 levels did not change significantly in either group ($p > 0.05$). The CKD5D group showed an increase in albumin-corrected Ca levels (p = 0.031) and a decrease in PTH levels (p = 0.043) during the follow-up. However, FGF-23 and P levels remained unchanged ($p > 0.05$). Free 25(OH)D levels (5.91 [4.21; 6.50] vs. 8.90 [6.51; 13.05] pg/mL) at the second visit were significantly lower in CKD5D than in controls ($p < 0.05$). Initial significant differences in the levels of Ca, P, FGF-23, PTH, DBP and vitamin D metabolites between the groups persisted after the cholecalciferol load.
Conclusion: CKD5D patients display distinctive disturbances in vitamin D metabolism. A loading oral dose of 150,000 IU cholecalciferol is effective and safe in reducing PTH in CKD5D patients with a tendency towards calcium normalization, without increasing phosphorus levels.
Acknowledgement: This work was supported by the Russian Science Foundation (grant number 19-15-00243-P).

P235
A DESCRIPTIVE LONGITUDINAL EXPLORATION OF THE BONE HEALTH AND BONE HEALTH SCREENING PATTERNS OF ADULTS WITH AN INTELLECTUAL DISABILITY IN IRELAND

A. Power[1], P. Mccallion[1], M. Mccarron[1], E. Burke[1]

[1]Trinity College Dublin, Dublin, Ireland

Objective: To longitudinally examine the bone health status, bone health screening patterns and factors that negate screening in adults with an intellectual disability over the age of 40 in Ireland and identify changes over time.
Methods: This research study was conducted with data generated from a large longitudinal study examining ageing among people with intellectual disability in Ireland. Ethics was approved by the TCD faculty of health sciences and all participating service providers. Each participant provided informed consent. Data used in this study extends from 2009–2020. Health domains explored include doctor's diagnosis of osteoporosis and healthcare utilisation.
Results: The prevalence of doctor diagnosed osteoporosis increased from 8.1% at Wave 1 to 21% at Waves 4. Simultaneously, DXA attendance increased from 16.8% at Wave 1 to 44.8% at Wave 4, Among the strongest predictors for attending DXA were residing in supported accommodation and aged > 65 y. Factors that negate DXA attendance include difficulty walking and not troubled with pain.
Conclusion: Osteoporosis is rising in prevalence among this vulnerable and high-risk cohort and despite increased attendance at DXA access remains relatively poor implying the prevalence of low BMD is likely to be largely underestimated. Recommendations for clinical practice and future investigation:

- Further research is warranted in people within the < 50 age category and people residing independently or with family as they were underrepresented in this study.
- Healthcare staff training and awareness is required in relation to bone health among people with intellectual disabilities emphasising the unique issues pertinent to bone health screening and people with intellectual disability.
- Improved policy and protocol provision to guide bone health promotion, associated risk factor identification and screening protocols or algorithms are required.

P236
VALIDATION OF QUANTITATIVE ULTRASONOGRAPHY FOR OSTEOPOROSIS DIAGNOSIS IN POSTMENOPAUSAL WOMEN COMPARED TO DXA

A. R. Singh[1]

[1]King George's Medical Univ., Lucknow, India

Objective: BMD is an essential indicator for diagnosing osteoporosis and evaluating the success of osteoporotic treatment. DXA, quantitative ultrasonography (QUS), and quantitative computed tomography (QCT) are frequently used for measuring BMD. The objective of the study was to evaluate the ability of QUS to screen for osteoporosis and bone density in postmenopausal women by calibrating it against DXA.
Methods: This cross-sectional study was conducted at the Dept. of Orthopedics and Trauma Center of the tertiary care center, Lucknow. A total of 90 patients visited this department from August 2017 to July 2018 for the present study. BMD in the same patient was evaluated by using DXA and ultrasonography methods. Data were entered in Microsoft Excel and analyzed by using SPSS Software.
Results: According to linear regression analysis, T neck was found statistically significant with T QUS ($p < 0.001$) and z QUS ($p < 0.001$). T lumbar and T wrist were found statistically significant with T QUS ($p < 0.001$) but not with z QUS ($p > 0.001$). Z neck was found statistically significant with T QUS ($p < 0.001$) and z QUS ($p < 0.001$). Z lumbar was found statistically significant with T QUS ($p < 0.001$) but not with z QUS ($p > 0.005$). Z wrist was not found statistically significant with T QUS ($p > 0.005$) or with z QUS ($p > 0.005$).
Conclusion: In the present study, we found that QUS can be used as a screening tool for detecting osteoporosis by measuring BMD in contrast to DXA. QUS also can be used to predict the DXA values for osteoporosis and to detect osteoporosis.

P237
USE OF REMS TECHNOLOGY FOR BONE HEALTH STATUS EVALUATION AFTER HORMONAL THERAPY IN TRANSGENDER SUBJECTS

A. Russo[1], C. Stomaci[2], P. Pisani[3], F. A. Lombardi[3], F. Conversano[3], R. Franchini[3], M. Di Paola[3], S. Casciaro[3]

[1]Dept. of Endocrinology, San Lorenzo di Borgo Valsugana Hospital, Trento, [2]Dept. of Biological and Environmental Sciences and Technologies, Univ. of Salento, Lecce, [3]Institute of Clinical Physiology, National Research Council, Lecce, Italy

Objective: Sex steroid hormones exert their effect on bone metabolism and musculoskeletal unit by the interaction with specific nuclear receptor expressed in the bone tissue, by regulating the continuous bone physiological remodeling inducing anabolic effects. The investigation of the long-term effect of gender affirming hormone therapy (GAHT) on bone metabolism assumes an important challenge. Radiofrequency echographic multispectrometry (REMS) is a nonionizing technology used to assess the bone health status and fracture prediction by the analysis of the reference axial sites: lumbar spine (LS) and femoral neck (FN). REMS has been widely validated in comparison with DXA, showing good accuracy and precision ($> 90\%$), therefore represents a valid technology to monitor bone health status in a short-term period. Consequently, the aim of this preliminary clinical study is to follow-up the bone health of transgenders subject within 1 y from the treatment starting by using REMS in order to understand the impact of GAHT on bone health status.
Methods: A total of 5 transgender patients were enrolled in the Endocrinology department of the hospital San Lorenzo di Borgo Valsugana, Trento (Italy). The study population included 3 assigned male at birth (AMAB) in therapy with oestradiol valerate 2 g/die and cyproterone acetate 25 mg/die; and 2 assigned female at birth (AFAB) in therapy with testosterone 25 mg/die. Patients underwent LS-DXA scan before the initiation of GAHT, and subsequently, REMS technology has been used to monitor bone health status after patient's therapy initiation.
Results: All the results were collected in the following Table:

	AMAB LS
	T-SCORE TOT ± DS
DXA	-1.8 ± 1.8
REMS	-0.3 ± 0.3

	AFAB LS
	T-SCORE TOT ± DS
DXA	0.9 ± 0.4
REMS	0.5 ± 0.4

The results show an increase of T-score values in AMAB after estrogen treatment starting, and no effect on bone in AFAB subjects after GAHT; this phenomenon can be explained considering on one hand the protective effect of estrogen therapy in AMAB subjects against bone loss, and on the other hand the combined effect of the decrease of estrogen together with the increase of testosterone in AFAB ones.

Conclusion: These preliminary results demonstrate the suitability of REMS for the bone health status monitoring in these subjects and show, as expected, the positive impact of estrogen therapy in AMAB subject's bone loss.

P238
PRP THERAPY IN OA KNEE: MY EXPERIENCE (A SERIES OF 350 CASES–380 KNEES)

A. S. Bhatia[1]

[1]Dr Bhatia's Bone & Joint Care Clinic, Chandigarh, India

Objective: Osteoarthritis (OA) is a major source of disability, pain, and economic burden worldwide. Genetic, biochemical, and mechanical factors are responsible for the complex multifactorial epidemiology of the disease. Abnormal joint biomechanics, age, gender, joint injury, and high BMI, along with a strong genetic basis, are associated with OA development. Presently, OA is the eighth most common disease in males world over and the fourth most common disease in females [1]. Previously, OA was believed to be caused by the mechanical degradation of cartilage. But now the understanding is, this a complex of, mechanical, chemo- inflammatory, the pathophysiology is complex inter play leading to the production of matrix metalloproteinases (MMPs), nitric oxide (NO), and prostaglandins (PGs), leading to matrix degradation [2]. The catabolic effects of interleukins secreted by chondrocytes, mononuclear cells, osteoblasts, and synovial cells interfere with the activity of growth factors and reduce the synthesis of aggrecan, which is the key constituent of the matrix providing resilience to cartilage [3]. IL-1β, the proinflammatory cytokine, is a major protagonist in inducing arthritic changes, as evident by its increased levels in the synovial fluid of affected joints [4–5]. Intra-articular injection of platelet-rich plasma (PRP) has been broadly considered for cartilage repair, as it could enhance matrix synthesis thanks to the properties of its growth factors (mostly PDGF and TGFβ) [6–8]. To evaluate the efficacy of PRP intra-articular injections in OA knee patients. A series of 123 patients with different grade of OA. Assessing the recovery on VAS and WOMAC scale.

Methods: 8 ml of patient's blood taken in two tubes containing 0.5 ml of sodium citrate (38% w/l). Centrifuged at the 4000 rpm for 20 min. Let sample rest for about 5 min, about 5–6 ml of PRP is extracted. Patient shifted to operation theatre. After proper skin sterilisation and knee draping. This PRP is injected into the knee joint. 2nd injection of PRP repeated after one month. The patient's progress is assessed after the second injection. First case done 4 y. Back and last case included 6 months back (today-26/12/23). Recovery assessed with VAS and WOMAC scale. Four aspects of WOMAC sore taken into consideration: (1) pain at night, (2) rising from sitting, (3) walking on flat surface, (4) ascending and descending stairs, (5) performing light domestic duties, and (6) performing heavy domestic duties.

Results: In the series 350 cases–380 KNEES of taking into consideration the severity of OA as per K&J classification—Grade 2 (minimal) moderate joint reduction, Grade 3 (moderate) severe joint space reduction with subchondral sclerosis, Grade 4 (severe) large osteophytes, marked narrowing of joint space, severe sclerosis and definite deformity of bone ends. BMI of the patient, age of the patient showed: (1) pain at night 95–100%, (2) rising from sitting 86–100%, (3) walking on flat surface 85–100%, (4) ascending and descending stairs 60–90%, (5) performing light domestic duties 70–96%, and (6) performing heavy domestic duties 60–95%. Across various Grade of OA (Grade 2 to 4). Patients were also instructed for regular exercises to strengthen their thigh muscles and lifestyle changes to bring their body weight in permissible levels as per their height.

Conclusion: PRP therapy in moderate to severe OA knee showed good to excellent results in improving pain during rest, pain free walk, climbing stairs. Patients who do not want TKR is worth trying. Up to two years follow patients are happy and pain free.

References:

1. Haq SA, Davatchi F. J Rheum Dis 2011;14:122
2. Johnson CI, et al. Vet J 2016;209:40
3. Fotouhi A, et al. Biomed Pharmacother 2018;104:652
4. Phillips KLE, et al. Osteoarthr Cartilage 2015;23:1165
5. Mabey T, Honsawek S. World J Orthop 2015;6:95
6. Barile A, et al. Br J Radiol 2016;89:20150355
7. Minutoli F, et al. Radiol Medica 2020;125:280
8. Ogura A, et al. Radiol Medica 2020:125:474

P239
BONE MICROARCHITECTURE IMPAIRMENT IN PATIENTS WITH SJÖGREN'S DISEASE IS ASSOCIATED WITH DAMAGE INDEX

A. S. Franco[1], I. H. Murai[1], T. H. Yang[1], L. Takayama[1], V. L. N. Bonoldi[1], V. F. Caparbo[1], L. K. N. Guedes[1], D. S. Domiciano[1], S. G. Pasoto[1], C. P. Figueiredo[1], R. M. R. Pereira[1]

[1]Division of Rheumatology, Hospital das Clinicas HCFMUSP, Faculdade de Medicina, Universidade de Sao Paulo, Sao Paulo, Brazil.

Objective: To assess bone microarchitecture parameters and their associations with systemic disease activity and damage index in women with Sjögren's disease (SjD).

Methods: A cohort of 106 women with SjD (mean ± SD age: 49.6 ± 9.2 y and BMI: 28.1 ± 5.5 kg/m^2) was recruited from a tertiary hospital in Sao Paulo, Brazil. Exclusion criteria were immunomediated diseases, hepatitis B/C, sarcoidosis, IgG4-related disease, head and neck radiotherapy and/or medications that affect bone metabolism. Bone microarchitecture at the distal radius and distal tibia was assessed using HR-pQCT. Systemic disease activity and damage index were measured by ESSDAI and SSDI, respectively. Spearman's correlation coefficient was used to analyze the relationship between bone parameters and SjD-related indices. A multivariate generalized linear model (GLM) was used to explore the effects of ESSDAI and SSDI on bone variables that showed $P < 0.10$ in the bivariate analysis. The significance level was set at 5%.

Results: The parameters had the following median (IQR): ESSDAI 1 (1–3), SSDI 2 (1–3) and disease duration 7 (4–14). SSDI was directly correlated with disease duration ($\rho = 0.22$; $P = 0.02$). At the radius, SSDI was inversely correlated with cortical area (Ct.Ar) ($\rho = -0.21$; $P = 0.04$), cortical volumetric BMD (Ct.vBMD) ($\rho = -0.23$; $P = 0.02$), and positively correlated with cortical porosity (Ct.Po) ($\rho = 0.33$; $P < 0.01$). At the tibia, negative correlations were observed between SSDI and Ct.Ar ($\rho = -0.31$; $P < 0.01$), total vBMD ($\rho = -0.26$; $P = 0.01$), trabecular number (Tb.N) ($\rho = -0.23$; $P = 0.03$), cortical thickness ($\rho = -0.23$; $P = 0.02$) and Ct.vBMD ($\rho = -0.40$; $P < 0.01$). In addition, SSDI was positively correlated with trabecular separation (Tb.Sp) ($\rho = 0.22$; $P = 0.03$), Ct.Po ($\rho = 0.39$; $P < 0.01$) and pore diameter ($\rho = 0.31$; $P < 0.01$). Multivariate GLM with adjustment for age, disease duration and cumulative prednisolone dose showed significant associations between SSDI and Ct.Po at the radius ($\beta = 0.35$; $P < 0.01$) and tibia

($\beta = 0.21$; $P = 0.02$) and Tb.N ($\beta = -0.23$; $P = 0.03$) at the tibia. No significant associations were observed between ESSDAI and bone microarchitecture.

Conclusion: In this cross-sectional study, damage index was independently associated with bone microarchitecture impairment in women with SjD. The findings suggest that SSDI could be a useful and feasible tool for estimating the extent of bone involvement in SjD, highlighting the importance of investigating bone health in this disease.

P240
PHYSICAL ACTIVITY IS ASSOCIATED WITH BONE MICROARCHITECTURE, BONE BIOMECHANICAL PROPERTIES, AND MUSCLE STRENGTH IN SJÖGREN'S DISEASE PATIENTS

A. S. Franco[1], T. H. Yang[1], I. H. Murai[1], L. Takayama[1], V. L. N. Bonoldi[1], V. F. Caparbo[1], L. K. N. Guedes[1], D. S. Domiciano[1], R. M. R. Pereira[1], S. G. Pasoto[1], C. P. Figueiredo[1]

[1]Division of Rheumatology, Hospital das Clinicas HCFMUSP, Faculdade de Medicina, Universidade de Sao Paulo, Sao Paulo, Brazil

Objective: To analyze the correlations between physical activity (PA) and bone microarchitecture, bone biomechanical properties, muscle strength, and disease-related parameters in women with Sjögren's disease (SjD).

Methods: A cohort of 106 women with SjD (mean ± SD age: 49.6 ± 9.2 y and BMI: 28.1 ± 5.5 kg/m^2) was recruited from a tertiary hospital in Sao Paulo, Brazil. Exclusion criteria were other immunomediated diseases, hepatitis B/C, sarcoidosis, IgG4-related disease, head and neck radiotherapy and medications that affect bone metabolism. Bone microarchitecture and biomechanical parameters (S: stiffness and F.load: estimated load to failure) at the distal radius and distal tibia were assessed using HR-pQCT and finite element analysis, respectively. Handgrip strength was evaluated using a dynamometer. Questionnaires were used to quantify PA levels (Baecke Questionnaire of Habitual PA), systemic disease activity (ESSDAI), damage index (SSDI) and functional capacity (HAQ). The sample was divided into tertiles of PA levels according to the total activity index. Differences between tertiles were assessed using the Kruskal–Wallis test or generalized linear model. Spearman's correlation coefficient was used to evaluate the relationship between the total activity index and all dependent variables. The significance level was set at 5%.

Results: The median (IQR) total activity index was 7.5 (6.4–8.4), ESSDAI: 1 (0–3), SSDI: 2 (1–3) and HAQ: 0.3 (0–0.7). The mean ± SD handgrip strength was 17.1 ± 6.4 N. The total activity index significantly differed ($P < 0.01$) when comparing the lower: 5.5 (5.2–6.2), middle: 7.5 (6.9–7.7), and upper: 8.7 (8.4–9.5) tertiles of PA levels. At the radius, PA levels were directly correlated with cortical area ($\rho = 0.28$; $P < 0.01$), total volumetric BMD ($\rho = 0.21$; $P = 0.03$), cortical thickness ($\rho = 0.22$; $P = 0.03$), S ($\rho = 0.29$; $P < 0.01$), and F.load ($\rho = 0.28$; $P < 0.01$). At the tibia, positive correlations were shown for S ($\rho = 0.21$; $P = 0.04$) and F.load ($\rho = 0.21$; $P = 0.04$). Handgrip strength was significantly correlated with PA levels ($\rho = 0.32$; $P < 0.01$). Tertiles of PA levels significantly differed for handgrip strength ($P < 0.01$), S ($P = 0.02$) and F.load ($P = 0.02$) at the radius. No significant correlations were observed with any other variables.

Conclusion: In women with SjD, PA levels were positively correlated with bone and muscle strength. The findings highlight the importance of PA as a feasible tool in multifaceted management to counteract SjD-induced bone impairment.

P241
UTILITY OF TRABECULAR BONE SCORE IN THE EVALUATION OF LUNG TRANSPLANT CANDIDATES

A. Sherman[1], A. Shokrekhuda[1], D. Kalbi[1], K. Chun[1]

[1]Montefiore Medical Center, Albert Einstein College of Medicine, Bronx, USA

Objective: The present study sought to investigate the value of TBS, in conjunction with DXA, for the evaluation of BMD and microarchitecture in lung transplant candidates.

Methods: A retrospective review of 191 DXA scans of patients undergoing lung transplantation at a large, urban, academic medical center was performed. All patients underwent BMD screening using DXA. TBS iNsight software was applied to DXA images of the lumbar spine (L1 through L4 vertebrae). DXA and TBS measurements were standardized by T-scores using population-based reference data and applied to established cutoffs for osteopenia, osteoporosis, partially degraded bone, and degraded bone. Pathologic bone requiring medical intervention was defined at DXA or TBS T-score < -1.0.

Results: DXA and TBS T-scores were found to be moderately correlated, $r = 0.50$, $p < 0.001$. However, TBS T-scores ($M = -1.97$, $SD = 1.31$) were, on average, significantly lower than DXA T-scores ($M = -0.79$, $SD = 1.56$), $t(190) = 11.17$, $p < 0.001$. There were 153 cases (80.1%) for which the TBS T-score was less than the corresponding DXA T-score. Significantly more patients had pathologic bone requiring medical intervention according to TBS (72.3%) than DXA (47.6%), exact McNemar's $p < 0.001$. Differences in the observed rates of osteopenia (36.6%), osteoporosis (11.0%), partially degraded bone (38.7%), and degraded bone (33.5%) were also statistically significant, exact McNemar's $p < 0.001$. Three times the number patients were found to have degraded bone by TBS compared to osteoporosis by DXA, exact McNemar's $p < 0.001$.

Conclusion: Osteoporosis and impaired trabecular microarchitecture are extremely common among lung transplant candidates. A substantial proportion of patients remain at risk of fracture through degraded bone despite normal BMD. TBS offers promise as a simple, noninvasive, and inexpensive screening adjunct to DXA in this unique and vulnerable population.

P242
GENDER AND RACIAL/ETHNIC DIFFERENCES IN BONE MINERAL DENSITY AND MICROARCHITECTURE AMONG LUNG TRANSPLANT CANDIDATES

A. Sherman[1], A. Shokrekhuda[1], D. Kalbi[1], K. Chun[1]

[1]Montefiore Medical Center, Albert Einstein College of Medicine, Bronx, USA

Objective: To compare gender and racial/ethnic differences in BMD and microarchitecture among lung transplant candidates using DXA and TBS.

Methods: A retrospective cohort of 191 lung transplant candidates undergoing DXA and TBS screening was analyzed. The sample had a modest male predominance (61.8%) and relatively diverse racial/ethnic composition (46.3% Hispanic, 29.4% White, 21.9% Black, 2.4% other). DXA T-scores were standardized using the manufacturer's Caucasian, gender-matched reference population (1). TBS T-scores were calculated with reference to an established Caucasian, female cohort (2).

Results: Male ($M = -0.67$, $SD = 1.50$) and female patients ($M = -0.99$, $SD = 1.65$) had statistically equivalent mean DXA T-scores, $t(189) = 1.40$, $p = 0.16$. However, female patients

(M = − 2.40, SD = 1.50) had significantly lower mean TBS T-scores than male patients (M = − 1.71, SD = 1.10), t(189) = 3.58, $p < 0.001$. There was a significant main effect of race/ethnicity on DXA T-score, F(2, 153) = 6.78, p = 0.002. By contrast, race/ethnicity did not significantly impact TBS T-score, F(2, 153) = 0.17, p = 0.84. Hispanic patients (M = − 1.13, SD = 1.56) had significantly lower DXA T-scores than Black (M = − 0.12, SD = 1.68), p = 0.003, and White patients (M = − 0.40, SD = 1.13), p = 0.03. There was no significant difference in DXA T-scores between White and Black patients, p = 0.67.

Conclusion: Gender-matched referencing appears to mitigate disparities in patients undergoing DXA but does not yet exist for TBS. TBS was less sensitive in detecting degraded bone microarchitecture in men, possibly due to standardization by a female cohort. This study also underscored known issues with using Caucasian reference standards for DXA. TBS, however, was found to be particularly robust against racial/ethnic differences.

References:

1. Kelly TL, et al. PloS One 2009;4(9):e7038
2. Hans D, et al. J Bone Miner Res 2011;26:2762

P243
CTX LEVEL MIGHT BE ASSOCIATED WITH THE INCREASE IN BONE MINERAL DENSITY IN OSTEOPOROTIC SUBJECTS TREATED WITH DENOSUMAB

A. Shinkov[1], J. Vlahov[2], M. Angelova[1], D. Petrova[1], I. Yankova[1], J. Petrova[1], R. Kovatcheva[1]

[1]Medical Univ. Sofia, Medical Faculty, Dept. of Endocrinology, [2]Sofiamed Hospital, Sofia, Bulgaria

Objective: The role of the bone metabolic markers in the treatment and follow-up of postmenopausal osteoporosis is still controversial. It is assumed the initial marker levels and their continuous suppression might be related to the effect of the antiresorptive therapy. The aim of the study was to explore the association of CTX levels with the effect of the treatment with denosumab on the BMD.

Methods: 120 postmenopausal women with osteoporosis and high fracture risk were enrolled. Baseline BMI, BMD at lumbar spine (BMD-L) and proximal femur (BMD-N and BMD-T) and serum CTX were measured. All participants started standard of care treatment with denosumab 60 mg every 6 months. BMD and CTX were followed-up at months 12 and 24 months. The relative changes in the BMD and the CTX were calculated and correlations were explored.

Results: 119 subjects attended the month 12 visit and 91 subjects the month 24 visit. At Month12 BMD-L increased by 6.2% (2.4–8.4), BMD-N by 1.1% (0.1–2.4), BMD-T by 1.2% (0–2.9), all $p < 0.001$. At month 24 BMD-L increased by 8.5% (5.9–11.2), BMD-N by 1.8% (0.7–4.2) and BMD-T by 2.7% (1.1–3.8), all $p < 0.001$). The baseline CTX was 0.54 (0.2) ng/ml and was decreased by 76% (58–85) at Month12 and by 75% (54–84) at Month24. The change in BMD at any site was not associated with the age or the BMI. The increase in BMD-L at Month24 but not Month12 was weakly correlated to the baseline CTX (r = 0.24, p = 0.047) when controlling for age and BMI. No association was found between the CTX and the change in BMD-N or BMD-T. The increase in BMD-L at Month24 correlated with the reduction in CTX (r = 0.31, p = 0.22).

Conclusion: Baseline CTX levels show weak correlation with the increase in BMD but only at the lumber spine. The continuous suppression of CTX at Month24 correlates better with the BMD-L increase and might serve as a prognostic factor for the clinical efficiency of denosumab. Further research is needed to corroborate these observations.

P244
FRACTURE LIAISON SERVICE: CAN WE REALLY CHANGE PATIENT'S OUTCOMES?

A. Silva[1], A. M. Monteiro[1], A. R. Lopes[1], A. Pinto[2], M. Silvério-António[1], M. Magalhães[3], A. R. Cruz-Machado[1], A. M. Silva[2], A. Tirado[2], J. C. Romeu[1]

[1]Rheumatology and Metabolic Bone Diseases Dept., Hospital de Santa Maria, EULAR Center of Excellence in Rheumatology Research, Centro Hospitalar Universitário Lisboa Norte, Lisbon Academic Medical Center, [2]Orthopaedics and Traumatology Dept., Centro Hospitalar Universitário Lisboa Norte, [3]Unidade de Saúde Familiar do Parque, Agrupamento de Centros de Saúde Lisboa Norte, Lisbon, Portugal

Objective: To describe the initial results of a single centre type A Fracture Liaison Service (FLS) care.

Methods: On May 2023, we reviewed the clinical charts of patients referred to the FLS program between 01.2020 to 06.2022. We considered an intervention group (IG)—patients effectively evaluated—and a control group (CG)—those who were not.

Results: 507 patients were referred to the FLS program and most of them—393 (77.5%)—were formally evaluated, while 114 were not (CG) for several reasons, such as nonfulfillment of requirements or discharge prior to the FLS team evaluation. 79.6% of the IG and 76.3% of the CG were female, most had a proximal femur fragility fracture (FF) (99.4% and 99.1%) with a mean age at FF diagnosis of 83.1 ± 8.8 and 81.9 ± 10.8 years, as well as a median follow-up time of 17 [11–24] and 15 [3.75–25] months, respectively. In the IG, antiresorptive therapy was recommended to 341 patients (86.8%), but only 161 (47.2%) had complied: alendronate in 69 patients (54.8%), zoledronate in 68 (39.3%) and denosumab in 24 (57.1%). Out of the treated patients, 1/3 on alendronate and denosumab and half on zoledronate have discontinued the treatment. The IG and CG were similar at baseline, with differences at the level of autonomy prior to the fracture (p = 0.018); number of previous FF (p = 0.002) and length of hospitalization (p = 0.001), all lower in the CG. The frequency of antiresorptive therapy initiation was higher in the IG ($p < 0.001$), but no differences were found in the number of readmissions, new FF or deaths, although there was a favorable trend in the last two outcomes for the IG.

Conclusion: FLS care was not associated with a significant reduction in subsequent fractures, in line with previous studies with a follow-up ≤ 2 y. Our FLS program began in the critical period of the COVID-19 pandemic, with a reduced accessibility to health care, which can explain, at least partially, the lack of benefit regarding the reduction of new FF and deaths. Nevertheless our results seem promising and we will keep working to improve clinical outcomes.

P245
LONG-TERM EFFECTS OF DENOSUMAB IN A PATIENT WITH SYMPTOMATIC PRIMARY HYPERPARATHYROIDISM

D. Grigorie[1], A. Badici[1], A. Sucaliuc[1]

[1]National Institute of Endocrinology, Bucharest, Romania

Objective: Denosumab can be used to increase bone density in patients who choose not to have surgery, but who meet specific guidelines (1). We aimed to observe long-term (3 y) effects of

denosumab on BMD, hypercalcemia and bone turnover markers in a patient with primary hyperparathyroidism (PHPT) and osteoporosis.
Methods: A 73-year-old woman with surgical menopause (at age 48) was diagnosed with PHPT in 2011, based on total serum calcium of 11.7 mg/dl and increased PTH of 242 pg/ml; she had osteoporosis by DXA at all three sites: LS T-score − 3.2 SD, femoral neck − 2.5 SD, one-third radius − 3.9 SD with a Z-score at − 2.2 SD; serum C-telopeptide was 1 ng/ml. There were no fractures, and a small stone was seen in the right kidney. On ultrasound a small left inferior parathyroid adenoma was seen, confirmed on subsequent surgery. She denied surgery and agreed to receive treatment with denosumab for three years. Finally, she wished to be operated on, and a 0.95 g adenoma of the left inferior parathyroid gland was removed with cure.
Results: After 3 y of denosumab the BMDs increased at all sites: + 4.5% at the LS, + 6.5% at the FN and by 9% at one-third radius. The effects on serum calcium were variable, with rebound before next dosage. Serum CTX also had variable suppression (nadir at 0.15 ng/ml after 3 dosages) with a tendency of minimal suppression in the third year (0.75 ng/ml). In the three years after the surgical cure BMD increased by 5.1% at the LS and by 6.6% at the FN.
Conclusion: Denosumab is an efficacious treatment for osteoporosis in PHPT patients who choose not to have surgery. The changes were similar after surgery.
Reference: (1) Grigorie D, Sucaliuc A. Acta Endocrinologica (Buchar) 2014.

P246
DOES COMORBIDITY IMPACT ON THE PREVALENCE OF OSTEOPOROSIS IN PATIENTS WITH RHEUMATOID ARTHRITIS?

A. T. Mamasaidov[1], A. A. Ansarova[2], E. V. Kalinina[2], A. R. Babaeva[2], K. S. Solodenkova[3]

[1]Osh State Univ., Faculty of Medicine, Osh, Kyrgyzstan, [2]Volgograd State Medical Univ., Volgograd, Russia, [3]Sechenov Univ., Moscow, Russia

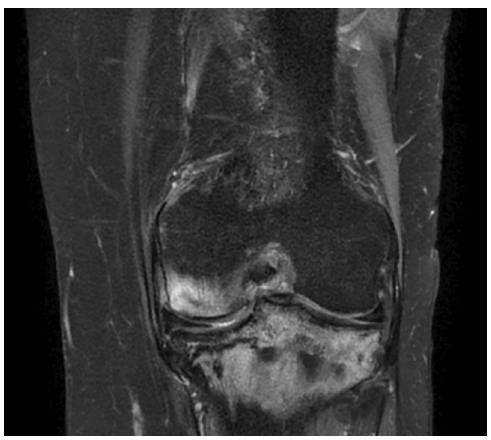
Objective: To assess the relationship between the presence of comorbid pathology, as well as the use of glucocorticoids (GC), on the one hand, and the presence of osteoporosis (OP), on the other hand, in patients with rheumatoid arthritis (RA).
Methods: We investigated 264 patients with a definite diagnosis of RA (ACR/EULAR criteria, 2010), aged from 26–79 y (average age 58.21 ± 2.09), women predominated (211 people—79.92%). The duration of RA in 82.58% of patients exceeded 5 y, the average duration was 12.14 ± 3.26 y. Based on the submitted medical documentation and the standard examination of patients, the presence and spectrum of comorbid pathology and radiologically proven OP were analyzed. The influence of comorbidity, as well as GC therapy on the development of OP, was assessed by the frequency of registration of OP in patients with and without concomitant diseases and GC therapy using the χ^2 criterion.
Results: Comorbid pathology was observed in 218 patients with RA, which amounted to 82.58%. The range of concomitant diseases was represented by cardiovascular pathology (in 73.48% of patients), gastrointestinal and liver diseases (48.48%), anemia (29.92%), kidney and urinary tract diseases (33.33%), respiratory diseases (17.04%), type 2 diabetes mellitus (8.33%). The frequency of use of systemic GCs turned out to be quite high—68.94%; in individuals with comorbidity, the cumulative dose of GCs was significantly higher (6.89 vs. 3.16 g, $p < 0.01$). Systemic OP was diagnosed in 58.33% of RA patients, while 7.95% had a history of osteoporotic fractures. Systemic OP was significantly more often recorded in comorbid patients than in patients without comorbidity (138 people—63.3% vs. 16 people – 34.78%, $\chi^2 > 4.0$, $p < 0.05$). Along with this, an association of OP with the use of GC therapy was observed: in patients receiving GC at a dose of > 5 mg in terms of prednisolone, OP was recorded with a frequency of 74.73 vs. 21.95% in the group that did not receive GC ($\chi^2 > 4.0$, $p < 0.05$).
Conclusion: Comorbid pathology occurs in the vast majority of RA patients and is associated with the duration and intensity of GC therapy. Systemic OP is recorded in more than half of patients with advanced or late stage RA. A direct connection was found between the presence of comorbidity and the prevalence of OP, as well as between the long term GC therapy and the development of systemic OP.

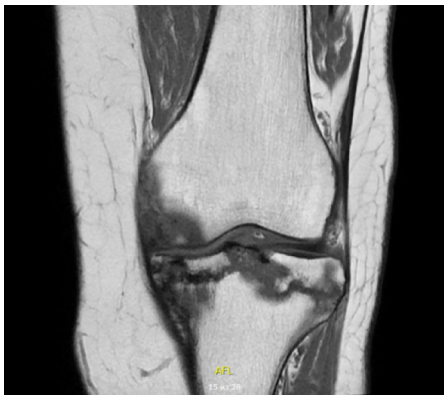
P247
THE CASE OF MULTIPLE STRESS FRACTURES IN A PATIENT WITH RHEUMATOID ARTHRITIS AND OSTEOPOROSIS SUCCESSFULLY TREATED BY TERIPARATIDE

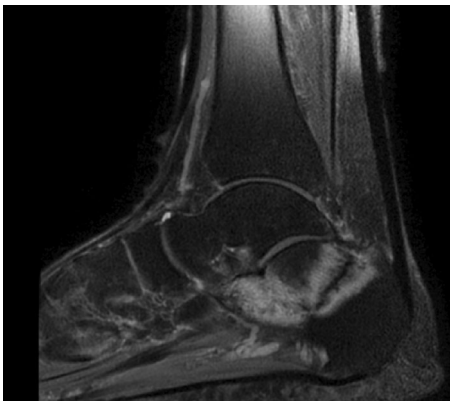
A. Tarasova[1]

[1]Hadassah Moscow, Moscow, Russia

The patient is a 77 years old generally healthy woman with a history of low activity rheumatoid arthritis on methotrexate 15 mg a week previously treated with methylprednisolone. She first presented at the age of 72 years old. At that moment she was already diagnosed osteoporosis with radius fracture treated for several years by alendronic acid. Her main complaint was knee pain during walking and MRI showed stress fracture of her left tibial plateau. She received zoledronic acid infusion twice. After that her DXA T-score was − 2.7 in femoral neck and − 1.8 in L1–L4. In 2021 DXA result was stable and even improved in hip (− 2.4). Left knee MRI in June 2021 showed the same picture of stress fracture with massive bone oedema and right heel MRI also showed stress fracture which was new. Nevertheless the patient decided to stop therapy for a while though she continued to experience painful symptoms in her legs. She presented again in 2022 with severe knees and right heel pain on walking. She was using crutches and NSAIDs and opioid analgesics had only mild effect. Left knee MRI was remarkable by slight decrease of bone oedema though tibial deformity and subchondral fragmentation increased with no signs of active synovitis. Right heel MRI at the same time was remarkable for increase of fracture line and also slight bone oedema decrease with no signs of active synovitis.







Haemoglobin was slightly decreased (11,7 g/dl), ESR was elevated up to 84 mm/h. Blood sugar was slightly elevated up to 6.7 mmol/l though HA1c was 5.6. BUN and calcium were normal. The patient had normal BMI and showed no signs of rheumatoid arthritis activity. She was recommended to start teriparatide in the standard dose daily and 1000 mg of calcium and 2000 IU of vitamin D. In a month her pain totally disappeared, she continued using crutches to let fractures heal. 6 months later MRI showed the same picture. In July 2023 the patient was diagnosed B-cell lymphoma and treated with R-CHOP mini. Haematologist didn't insist on stopping teriparatide. In October 2023 the patient experienced a severe fall on her side but didn't break any bone. In December 2023 her PET-CT showed signs of fractures consolidation.

P248
CASE PRESENTATION OF A PATIENT WITH POST COVID ARTHRITIS

A. Todorovic[1], D. Draskovic-Radojkovic[2], G. Tulic[3]

[1]Medigroup,General Hospital, [2]Naya Medic, [3]Unversity Clinic Center of Serbia-Clinic of Orthopaedic Surgery and Traumatology, Belgrade, Serbia

Reactive arthritis can occur after various infections, even if joint pain was not initial symptoms. Arthritis that develops after COVID-19 may be the result of long COVID, or it may be a temporary side effect of the COVID-19 vaccine. Patients reported new-onset fatigue, myalgia, arthralgia, arthritis, muscle weakness, etc. According to a 2021 study Trusted Source, post-COVID-19 arthritis may occur as a result of inflammation, which is part of the body's natural immune response. The symptoms of reactive arthritis include inflammation, swelling, and pain in the joints.

Casereport: We present a case of a 25 year patient, soccer player, who was hospitalized on January 13, 2023, Rheumatology Clinic KCS with severe pain in the groin, tingling in the upper legs and swelling of the right knee and pain in the right ankle joint for the past 3 days. The complaints suddenly arise and led to the inability to walk. The patient stated that he had been suffering from COVID for several months before the symptoms appeared, he was on antibiotic therapy for 3 weeks. Examination: limited movements in both hips, arthritis of the right knee, contracture of 10°, painful of the ankle joint, positive Menels sign right, no arthritis of the other joints. Blood analyses: IgG AB for spike protein—1484 AU/ml, CRP—104, /l, HLAB27 positive peripher SpA. Echosonographic of joints: an anechoic effusion, 60 ml of clear synovial fluid. MRI: no signs of inflammation of the SI joints, synovitis of the left hip. Therapy was prescribed: pronison tbl 20 mg, sulafasalizin 2 × 2 g/d. Result no reduction in pain. Next therapy: high doses of sodium ascorbate, EGCG and glutathione intravenously twice weekly.

Result: After 6 weeks of therapy all pain was gone, he could walk normally and after 3 months he started to play soccer again.

Conclusion: This case illustrates difficulties in standard therapy of reactive arthritis after post-COVID and that antioxidative therapy could help to enhance immune answer due to higher oxidative stress in professional sportiest.

P249
FACTORS AFFECTING PATIENT ACCESS AND ENGAGEMENT WITH SURGICAL CARE SERVICES FOR HIP FRACTURE IN THE GAMBIA: AN ETHNOGRAPHIC STUDY USING A SOCIAL-ECOLOGICAL MODEL

A. Touray[1], J. Badjie[1], S. Drew[2], R. Chingono[3], C. Zinyemba[3], R. Gooberman-Hill[2], L. Gregson[2], A. Ward[4], K. Marena[5]

[1]Medical Research Council The Gambia @London School Hygiene and Tropical Medicine, Banjul, Gambia, [2]Musculoskeletal Research Unit, Translational Health Sciences, Bristol Medical School, Univ. of Bristol, London, UK, [3]The Health Research Unit Zimbabwe, Biomedical Research and Training Institute, Harare, Zimbabwe, [4]MRC Lifecourse Epidemiology, Human Development and Health, Univ. of Southampton, London, UK, [5]Orthopaedic unit, Edward Francis Small Teaching Hospital, Banjul, The Gambia

Objective: To investigate the delivery of hip fracture care across rural and urban settings in The Gambia, focusing on patient pathways from injury to access and utilisation of healthcare and traditional bone setter services.

Methods: An ethnographic approach was used to collect in-depth data through semistructured face-to-face interviews and participant observations over a period of 29 months between March 2021 and August 2023. A total of 77 purposively sampled participants were recruited from five study sites, comprising 40 hip fracture patients and 37 carers who were all family members of the patients. Data were analysed inductively using the framework method, and a socio-ecological model guided analysis.

Results: Participants were aged 23–100 y, most (n = 27; 77%) patients were female. The hip fracture care pathway was complex due to medical pluralism. Multiple factors influenced patients' access and engagement with surgical care, encapsulated through four themes: individual patient characteristics (e.g., age of patients) interpersonal relationships (e.g., family influence) institutional factors (availability of surgical equipment), and community factors (e.g., traditional bone setter patronage). The most common barriers to accessing surgical care were the strong belief in traditional bone setters and the inability

of patients to afford surgical fees and implants costing 180–1120 USD.

Conclusion: Patients are challenged during their care-seeking journey to navigate a complex pathway of care. In The Gambia, to improve access to, and engagement with surgical care for hip fracture patients, greater awareness of traditional bone setter practice and its influence on successful hip fracture management, is needed. The costs of surgical fees and implants are more than the annual salary of many Gambians. Health policy reforms that focus on enabling patients, who cannot afford surgical treatment, to access government hospital care. Is much needed.

Acknowledgement: NIHR–Wellcome Partnership for Global Health Research Collaborative Award.

P250
PAIN SYNDROME AND BONE MINERAL DENSITY IN ADULT PATIENTS WITH OSTEOGENESIS IMPERFECTA FROM THE REPUBLIC OF BASHKORTOSTAN

D. Valeeva[1], A. Tyurin[1], R. Khusainova[2]

[1]Internal Medicine Dept., Bashkir State Medical Univ., Ufa, [2]Medical Genetics Dept., Bashkir State Medical Univ., Endocrinology Research Centre, Moscow, Russia

Objective: Osteogenesis imperfecta (OI, Q78.0) is an inherited connective tissue disorder characterized by bone fragility under minimal loading. The characteristics of the bone system of adult patients with OI are of interest, which served as the purpose of our study.

Methods: We examined 64 patients with OI from the Republic of Bashkortostan (age 24.75 ± 5.31 y), the control group—40 healthy individuals of comparable sex and age. We evaluated the pain syndrome by visual analog scale (VAS), and 12 patients with OI had bone densitometry on Lunar Prology device.

Results: Blue sclerae occurred in 45 patients (70.3%), the number of fractures ranged from 3–50 (mean 13.11 ± 10.85). The mean BMD was 1.045 ± 0.208 g/cm^3, with a Z-score of − 0.375 ± 1.43. Back pain was reported by 67% of patients and joint pain by 92%. In the control group, the mean age was 22.96 ± 0.76 y. Fractures were rare and associated with significant external impacts. Back pain was noted by 63% of the subjects, joint pain—47%. The average level of BMD was 1.159 ± 0.082 g/cm^3, Z-criterion was 0.97 ± 0.606. The comparative analysis of the examined parameters revealed statistically significant differences in the level of BMD and Z-criterion ($t = 2.85$; $p = 0.0067$ and $t = 4.34$; $p = 0.0001$, respectively). The frequency of back pain syndrome was comparable in both studied groups, joint pain was statistically more frequently reported by patients with OI ($\chi^2 = 5.54$; $p = 0.019$).

Conclusion: Adult patients with OI are characterized not only by a reduced level of bone density, but also by the presence of joint pain without association with recent fractures.

P251
SPECIFICS OF HEPATITIS B VIRUS SEROLOGIC MARKER TESTING IN PATIENTS WITH RHEUMATOID ARTHRITIS

V. A. Aleksandrov[1], L. N. Shilova[2], E. A. Zagorodneva[3], I. Y. Alekhina[4], A. V. Aleksandrov[1]

[1]Volgograd State Medical Univ., Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, [2]Volgograd State Medical Univ., Dept. of Hospital Therapy, Volgograd, [3]Volgograd State Medical Univ., Dept. of Laboratory Diagnostics, Volgograd, [4]Stavropol State Medical Univ., Dept. of Hospital Therapy, Stavropol, Russia

Objective: Most antirheumatic drugs have an inhibitory effect on the immune system. So one of the complications of disease-modifying antirheumatic drugs (DMARDs) may be the reactivation of hepatitis B virus (HBV) replication in rheumatoid arthritis (RA) patients. We aimed to evaluate the extent of testing for HBV serologic markers in RA patients before DMARD treatment.

Methods: Clinical and laboratory examination of 146 patients with RA aged 24–62 y with negative results for HBV surface antigen (HBsAg-) detection was performed. All patients were screened for antibodies to HBV nuclear antigen (anti-HBcIgG) and antibodies to HBsAg (anti-HBs). 73.3% of patients were taking methotrexate, 52.7% were taking corticosteroids, and 11% were taking genetically engineered biological drugs.

Results: 29 patients were positive for anti-HBs and 13 RA patients were positive for anti-HBcIgG. In 9% of patients, baseline serologic tests indicated prior hepatitis B infection (HBsAg-, anti-HBs+/anti-HBcIgG+, n = 11; HBsAg-, anti-HBs-/anti-HBcIgG+, n = 2). According to clinical guidelines, patients previously exposed to HBV should be monitored for HBV antigens during DMARD treatment. Preliminary hepatitis B virus DNA (HBV DNA) detection by PCR was performed in only 15 (10%) patients with RA, with the vast majority of patients seropositive for anti-HBs+ only and one patient anti-HBc+. Patients with RA with latent HBV infection or anti-HBc-positive patients may experience HBV reactivation during DMARD treatment; more attention should be paid to detecting not only HBsAg and anti-HBs but also anti-HBc.

Conclusion: RA patients seropositive for anti-HBc need additional screening detection of hepatitis B virus DNA as well as regular testing for HBV DNA by PCR during DMARD treatment.

P252
COMORBIDITY AND VITAMIN D STATUS IN PATIENTS WITH RHEUMATOID ARTHRITIS

A. V. Rudenka[1], A. E. Buglova[1], T. D. Tiabut[1], G. A. Babak[2], K. A. Laurukevich[3], Y. V. Muryna[4]

[1]Belarusian State Medical Univ., Minsk, [2]Clinical Hospital #1, Minsk, [3]Brest Regional Clinical Hospital, Brest, [4]Minsk Clinical Consulting and Diagnostic Center, Minsk, Belarus

Objective: Rheumatoid arthritis (RA) is autoimmune disease characterized by chronic joint inflammation. Given the proposed role for vitamin D as an immune regulator, hypovitaminosis D may be associated with immune-mediated inflammatory diseases including RA. The purpose of this study is to evaluate incidence of comorbidities, serum 25(OH)D and to analyze relationship between patients' RA characteristics and vitamin D status.

Methods: 156 patients with RA were enrolled: 139 women (mean age 60.1 ± 13.7 y) and 17 men (mean age 58.8 ± 13.4 y). Assessment of clinical status included swollen (SJC) and tender (TJC) joint counts, physician's (PhGA) and patient's global assessments of disease activity (PGA), pane assessment by visual analogue scale (VAS). Serum levels of rheumatoid factor (RF), C-reactive protein (CRP), total vitamin D (25(OH)D) were determined. RA disease activity was calculated using DAS28 (disease activity score), SDAI (Simplified Disease Activity Index) и CDAI (Clinical Disease Activity Index). Statistical analysis was carried out using the Statistica 10 program for Windows.

Results: The most frequent comorbidities were cardiovascular diseases (79 patients), endocrine (51 patients), and gastrointestinal diseases (58 patients). 4 patients underwent joints replacement. Osteoporosis was detected in 51 patients (39.9%), osteopenia in 39 (30.5%), 38 patients (29.6%) had normal BMD. 25 patients (16%) had history of fractures. Mean 25(OH)D levels were 25.2 ± 13.2 ng/ml. Normal vitamin D, insufficiency and deficiency were observed in 47

(30.3%), 45 (28.7%) and 64 (40.7%) patients. Low levels of vitamin D were associated with higher rates of RA activity according to the DAS28, SDAI and CDAI indices, as well as with greater number of painful joints. Patients with concomitant diseases (n 105) differed statistically significantly from patients without comorbidities (n 51) in age, age of onset of the disease, PhGA, PGA, CDAI, SJC and TJC. There were no statistically significant differences in 25(OH)D concentrations between groups.

Conclusion: Hypovitaminosis D was observed in majority of patients with RA and was associated with higher RA activity. Vitamin D supplementation should be administered in patients with RA for potential immunomodulatory purposes and for prevention and treatment of bone metabolic disorders.

P253
TUMOR-INDUCED HYPOPHOSPHATEMIC OSTEOMALACIA: CASE REPORT

A. V. Rudenka[1], T. L. Karonova[2], K. A. Yakovanko[2], E. V. Rudenka[1], A. E. Buglova[1]

[1]Belarusian State Medical Univ., Minsk, Belarus, [2]Almazov National Medical Research Centre, St. Petersburg, Russia

Tumour-induced osteomalacia (TIO) is a rare paraneoplastic disorder caused by tumours secreting FGF23. Clinical manifestations of TIO develop slowly and are represented by symptoms of osteomalacia including bone pain, fragility fractures, and muscle weakness.

Casereport: 35-year-old woman with neither significant past medical history nor a relevant family history was referred to our clinic with complains of severe weakness, bone pain, pain in the spine, hip joints, muscles tremors, limited movement, "unruly legs," limitation of movements in the hip joints, decrease in height by 8 cm since 2019. Considers herself sick since 2019, when bone pain first appeared, avascular necrosis of both femoral heads was diagnosed on MRI and autologous bone grafting was performed. The first metabolic disorders were also detected in 2019: calcium 2.11 mmol/l (normal value 2.15–2.55), phosphorus 0.44 mmol/l (normal value 0.87–1.45). Other laboratory findings PTH: 78 pg/ml; normal value 15–68.3, alkaline phosphatase 238 U/l; normal value 35–105, 25(OH)D 22.1 ng/ml, normal value 30–50 ng/ml. Chest CT: multiple rib fractures, fractures of acromion. Osteoscintigraphy: multiple foci of bone destruction. Malignancy, parathyroid pathology, myeloma were excluded. There was a progressive decrease in bone mineral density from 2019–2021 (Z score—2.6). Considering the persistent decrease in phosphorus (from 0.36 to 0.59) and calcium (from 2.04 to 2.2) in the serum, it was assumed that the patient might have TIO. Tubular reabsorption of phosphorus was normal (94.3%) and 99mTc bone scan did not reveal SSTR-positive receptor tissue. Multiple sites of hyperexpression of SSTR in bones with probable primary FGF23 tumor site were identified in the lateral condyle of the right tibia on 68 Ga-DOTATATE PET/CT scan. Laboratory testing showed increased FGF23 level (328 kRU/L, normal 26–110 kRU/L). Patient was treated with phosphorus, calcium and vitamin D supplements, bisphosphonates and non-steroidal anti- inflammatory drugs without significant improvement as new locus of aseptic necrosis of the right humeral head occurred. Investigation with targeted examination of the suspicious area is planned to determine further treatment strategy including burosumab administration.

Conclusion: TIO is an underdiagnosed disease, leading to disability and mortality, whose awareness should be increased among physicians for timely and proper management of patients.

P254
EFFECTS OF EXTRACORPOREAL SHOCK WAVE THERAPY ON PATIENTS WITH TRIGGER FINGER

R. Nartea[1], A. Voicu[2], S. A. Nica[3], B. I. Mitoiu[4]

[1] "Carol Davila" Univ. of Medicine and Pharmacy, National Institute of Rehabilitation, Physical Medicine and Balneoclimatology, [2]Emergency Clinical Hospital "Prof. Dr. Agrippa Ionescu", [3]"Carol Davila" Univ. of Medicine and Pharmacy, National Institute of Rehabilitation, Physical Medicine and Balneoclimatology, [4]"Carol Davila" Univ. of Medicine and Pharmacy, Emergency Clinical Hospital "Prof. Dr. Agrippa Ionescu", Bucharest, Romania

Objective: Tendons that flex the fingers and thumb are affected by the trigger finger, which usually causes a locking or catching sensation when bending and straightening the digits. A trigger finger can affect anyone, but it is more common in middle-aged active people with occupations that involve heavy lifting, repetitive motions, grasping, gripping, or applying force with the fingers and thumbs (farming or gardening, industrial work, and racket sports, so on) [1–3]. Also, people with particular medical problems, such as gout, diabetes, metabolic syndrome, rheumatoid arthritis, osteoarthritis, amyloidosis, and thyroid disease have an increased risk of developing trigger finger [1–4]. We conducted a study that aims to investigate the effectiveness, safety, and potential benefit of using extracorporeal shockwave therapy (ESWT) as an alternative option for the treatment of trigger finger.

Methods: Sixteen patients, who were 2nd grade according to Quinnel classification and diagnosed with trigger finger, were included in this prospective cohort clinical study. Sixteen patients with trigger fingers were applied to 10 sessions, twice a week, for 3 weeks of rESWT (2000 impulses, 2.5 bars, 10–15 Hz). Pain scores (Numeric Pain Rating Scale), general functional capacity (Quick-DASH), range of motion, grip strength with Jamar Dynamometer, and pinch strength were evaluated before treatment, after treatment, and 3 months after the treatment.

Results: Pinch strength measurements using a dynamometer show a progressive improvement in pinch strength over time. Average pinch strength: 3.6 units represent the baseline pinch strength in the initial moment. After 3 weeks of intervention, there is a noticeable increase in average pinch strength of 4.5 compared to the initial moment. A pinch strength value of 5.7 indicates a significant enhancement in pinch strength compared to both the initial and second moments. Overall, the increasing trend in average pinch strength from the initial moment to the third moment suggests a positive response to the ESWT treatment received.

Conclusion: The results indicate that individuals experienced a progressive improvement (p-value 0.00022) in their pinch grip strength over the three-time points.

References:

1. Stewart CN, Ward CM. Hand (NY) 2022;17:529
2. Otelea MR, et al. Curr Issues Mol Biol 2022;44:2646
3. Nartea R. et al. Issues Mol. Biol 2023;45:3146
4. Lo YC, et al. Int J Surg 2023;109:2427

P255
REHABILITATION TREATMENT IN A PATIENT WITH FRACTURE OF THE LEFT HUMERAL DIAPHYSIS WITH LEFT RADIAL NERVE PARALYSIS, TREATED ORTHOPEDICALLY AND SURGICALLY: CASE PRESENTATION

D.-M. Dimulescu[1], B.-I. Mitoiu[2], A. Voicu[3], G. Chiriţi[1]

[1]Univ. of Medicine and Pharmacy "Carol Davila", National Institute of Rehabilitation Physical Medicine and Balneoclimatology, [2]Univ. of Medicine and Pharmacy "Carol Davila", Emergency Clinical Hospital "Agrippa Ionescu", [3]Emergency Clinical Hospital "Agrippa Ionescu", Bucharest, Romania

To highlight the role of a complex physical-kinetic treatment, applied to a patient with a spiroid fracture of the middle third of the left humeral diaphysis, initially treated orthopedically, after 2 weeks of metal osteosynthesis (screw plate), with paralysis of the left radial nerve.
Casereport: We present the case of a 63-year-old patient presented for: mixed pain of the left arm, referred to the left shoulder and elbow, marked functional impotence on all axes of motion, at the elbow joint, respectively left wrist-hand complex, predominantly on extension and supination. From the pathological history we note: the patient suffered, following a fall from her own height, a spiroid fracture of the middle third of the left humeral diaphysis, immobilized in the first phase, the patient refused surgery, after 2 weeks, due to the accentuated algic syndrome, metal osteosynthesis (screw plate) was performed—June 2023, followed by paralysis of the left radial nerve. Physical-kinetic treatment was instituted, which included: Curapuls on the left arm, electrostimulation with exponential currents on the extensor and supinator muscles of the forearm and left wrist-hand complex, ultrasound, laser therapy with analgesic and myorelaxant effects, interferential currents on the distal of the left upper limb. The physiotherapy program included: analytical movements, passive mobilizations, passive-active mobilizations of the left upper limb, followed by ergotherapy exercises. The patient underwent repeated inpatient and outpatient treatments, with improvement of the algic syndrome, without significant improvement of active mobility on extension and supination. Repeat electromyography was recommended and it was decided to ablate the osteosynthesis material 4 months after the operation (November 2023), after which the patient continued the ES and physiotherapy programme, in hospital, outpatient and at home. Following the applied physical-kinetic treatment, pain relief was obtained, with VAS score decrease from 9 points, at admission, to 6 points, at discharge, mobility improvement on extension and supination at the distal extremity of the left upper limb, muscle strength increase on the forearm extensors and of the wrist-hand complex.
Conclusion: The applied physical-kinetic program led to the improvement of the algo-dysfunctional syndrome at the level of the distal extremity of the left upper limb, increase of muscle strength at the level of the extensors and supinators of the forearm, wrist and left hand; the evolution was favorable also from the point of view of professional reinsertion, the patient being a seamstress and resuming her activity.

P256
RESULTS OF THE REHABILITATION PROGRAM FOR A PATIENT WITH COMPLEX REGIONAL PAIN SYNDROME IN THE HAND REGION

B. I. Mitoiu[1], A. Voicu[1], R. Nartea[2], G. Chiriti[2], D. M. Dimulescu[2]

[1]Emergency Clinical Hospital "Prof. Dr. Agrippa Ionescu", [2]National Institute of Rehabilitation, Physical Medicine and Balneoclimatology, Bucharest, Romania

To highlight the results of the rehabilitation program in case of a patient with complex regional pain syndrome type I post comminuted fracture in the right distal epiphysis radius.
Casereport: We present the case of a 54-year-old patient, right-hander, chef cook, BMI 26.3 kg/m^2, with Complex regional pain syndrome type I post comminuted fracture in the right distal epiphysis radius by falling down stairs, conservative treatment of fracture because the patient refused surgery, Osteoporosis in the lumbar spines, score T = − 3 at bone density test 05.2023, in treatment with bisphosphonates and alfacalcidol, major depressive syndrome after the death of the husband, treated 7 y ago, who is hospitalized in the rehabilitation department complaining of right wrist and hand pain, predominantly mechanical, of high intensity VAS 8/10, accompanied by paresthesia, finger II–V, associating pain at cervical and lumbar level, mechanical character, VAS 5/10, in the context of professional overload. Local examen reveals trophic and color changes in the skin of the fist-hand complex, active and passive limited range of motion in wrist and fingers joints, limited hand and fingers prehension, swelling and functional impotence at the same level. During the hospitalization the evolution was favorable, with significant improvement of pain syndrome, VAS 3/10 at the level of hand, and 1/10 at cervical and lumbar spine levels, and trophic skin changes was observed with modest improvement of mobility in the wrist joint and MCF II–V joint and increased muscle strength in the case of fingers pinch.
Conclusion: After an intensive rehabilitation program, pain decreased significantly and functional outcomes, such as active and passive range of motion and strength, revealed significantly better results compared to pretreatment but the whole dysfunctional picture of the patient are still issues to be treated in a long-term care program.

P257
CASE REPORT: MULTIDISCIPLINARY TEAM APPROACH IN CASE OF A PATIENT WITH RHEUMATOID ARTHRITIS MUTILANS

B. I. Mitoiu[1], A. Voicu[1], S. A. Nica[2], D. M. Dimulescu[2], G. Chiriti[2]

[1]Emergency Clinical Hospital "Prof. Dr. Agrippa Ionescu", [2]National Institute of Rehabilitation, Physical Medicine and Balneoclimatology, Bucharest, Romania

The importance of a multidisciplinary medical team in the case of a patient diagnosed with seropositive rheumatoid arthritis 40 years ago.
Casereport: We present the case of a patient, aged 60 y, with the following medical history: seropositive rheumatoid arthritis mutilans diagnosed at the age of 21, stage IV for which she underwent treatment, initially csDMARDs and after bDMARDs, last cure in June 2019, bilateral arthritis mutilans hands and feet, right spinal canal stenosis surgery in 2015 and 2019 by hemilaminectomy l3–l4–l5, spondylolisthesis l5-s1, bilateral coxarthrosis, bilateral gonarthrosis, osteopenia, iatrogenic Cushing syndrome, labile hypertension, chronic ischemic cardiomyopathy, dyslipidemia with hypercholesterolemia, hypothyroidism, right renal microlithiasis, bilateral inguinal hernia repair, major depressive syndrome, hospitalized accusing left low back pain that radiates to plantar level, progressively worsened in the last 2 weeks, VAS 10/10, chronic paresthesia in legs and feet, especially left one, hands and knees polyarthralgia, and functional incapacity for walking in pain context. Following the local examination, important changes are noted for all spine levels with reversal of physiological curvatures, and at the level of peripheral joints, leading to a high degree of disability. From functional point of view, the patient is able to walk assisted, on short distance using the zimmer frame, with difficulty, and on long distance using the wheelchair, requiring help to perform daily activities. During hospitalization, analgesic, myorelaxant, antidepressant,

gastroprotective treatments ware administered, without significant improvement of symptoms. The patient was transferred to the neurosurgery department where the surgical treatment of the left L4 disc herniation was performed with favorable evolution and symptomatology improvement, followed by a rehabilitation program in a specialized clinic.
Conclusion: Rheumatoid arthritis is an autoimmune disease with a strong negative impact on quality of life, especially from a functional point of view. However, cases of rheumatoid arthritis mutilans are increasingly rare due to early diagnosis and new treatment methods.

P258
REHABILITATION PROGRAM BENEFITS IN INCREASING THE QUALITY OF LIFE FOR PATIENTS WITH OSTEOPOROSIS ASSOCIATED WITH STROKE

B. I. Mitoiu[1], M. D. Alexe[1], A. Voicu[1], S. A. Nica[1]

[1]Univ. of Medicine and Pharmacy Carol Davila, Bucharest, Romania

Objective: To present the importance of rehabilitation procedures associated in the management plan for the patients that suffer from osteoporosis and stroke in order to increase their quality of life.
Methods: After reviewing the medical database in order to have an actualized and modern perspective of the impact of complex and personalized rehabilitation treatment for our patients with stroke and osteoporosis we can present the next most important aspects.
Results: Osteoporosis is a common bone disease characterized by fragility of the bones and requires a long term treatment. When osteoporosis coexist with other pathologies that also affect the skeleton and motor function the therapeutical management must be individualized and monitored frequently. Worldwide each year, 12.2 million people have a stoke, and among them around 5 million remain with different degrees of disabilities. After stroke, patients complain mostly of a decrease in motor and sensory level and also in visual and cognitive functions. In the first months after stroke they have a high risk of fall injuries and 37% of them have a least one episode of fall and all this leads to a diminished quality of life. Due to the lack of mobility and uncertainty in movement patients after a stroke episode tend to limit their physical activities and taking in consideration that more than 60% of them have over 70 years old it is mandatory to measure the bone density among all other clinical and paraclinical tests, in order to identify osteoporosis in due time.
Conclusion: Osteoporosis therapeutical management includes a healthy lifestyle, specific medication and not the last, the rehabilitation personalized treatment. Modern individualized rehabilitation should be focused on increasing bone and muscular strength. This nonpharmacological and noninvasive treatment consist in physical therapy procedures, nutrition counseling and occupational therapy. Most important in gaining bone and muscle strength it is the active part of rehabilitation which consist in personalizes exercises, using also vibration platforms, which can improve also the level of independence and the quality of life for our patients.

P259
ANALYSIS OF CHRONIC PAIN SYNDROME IN GERIATRIC PATIENTS

M. V. Tchikovskaya[1], D. G. Gubin[1], A. Y. Moshkina[1], Z. V. Kuimova[1], D. A. Elfimov[1]

[1]Federal State Budgetary Educational Institution of Higher Education "Tyumen State Medical University" of the Ministry of Healthcare of the Russian Federation, Tyumen, Russia

Objective: Chronic pain syndrome (CPS) is an important medical and social problem, since in elderly people persistent pain leads to an increased level of suffering, decreased cognitive functions and earlier mortality. An important goal of the state policy in the field of health protection is: to improve the health of the population by ensuring the availability of medical care by creating legal, economic and organizational conditions for the provision of medical services. The purpose of the study was to develop measures to improve the organization of medical care for geriatric patients with CPS in a polyclinic institution.
Methods: We analyzed 300 outpatient patient records in the department of medical and social assistance (MSA) of the Tyumen polyclinic. There were 3 groups of patients depending on their age: group I from 65–74 y (33.3%); group II 75–84 y (33.3%); group III 85 y and older (33.3%). The average age in: Group I is 69 years old; Group II is 80 years old; Group III is 91 years old.
Results: As part of the study of CPS localizations, it was revealed that: headaches (HA) are characteristic of patients of group I in 60% (n = 60) of cases, II in 63% (n = 63), III in 70% (n = 70); back pain (BP) occurred for patients of group I in 70% (n = 70) of cases, II in 72% (n = 72), III in 75% (n = 75); pain in large joints (PLJ) was in group I in 68% (n = 68) cases, II-th in 74% (n = 74), III-th in 82% (n = 82); pain in small joints (PSJ) were in patients of group I in 34% (n = 34) cases, II-th in 37% (n = 37), III in 42% (n = 42); arm pain (AP) of a non-articular nature occurred in patients of group I in 25% (n = 25) of cases, II in 30% (n = 30), III in 35% (n = 35); leg pain (LP) of a non-articular nature were in patients of group I in 46% (n = 46) cases, II in 51% (n = 51), III in 53% (n = 53); other localizations were characteristic of patients of group I in 3% (n = 3) cases, II-th in 4% (n = 4), III-th in 5% (n = 5). The types of pain had the following values: nociceptive pain in group I was in 65% (n = 65) of cases, II in 67% (n = 67), III in 69% (n = 69); neuropathic pain of group I in 20% (n = 20) of cases, II in 22% (n = 22), III in 24% (n = 24); nociplastic pain in group I in 15% (n = 15) of cases, II in 11% (n = 11), the III-th in 7% (n = 7). Hypesthesia to touch was in patients of group I in 11% (n = 11) of cases, II in 15% (n = 15), III in 17% (n = 17). Hypesthesia to needle pricking occurred in elderly people from group I in 10% (n = 10) of cases, II in 14% (n = 14), III in 15% (n = 15). The appearance or intensification of pain when running a finger over the skin was observed among patients of group I in 10% (n = 10) of cases, II in 11% (n = 11), III in 12% (n = 12). The frequency of pain syndrome was: daily in group I in 35% (n = 35) cases, II in 45% (n = 45), III in 48% (n = 48); several times a week in group I in 34% (n = 34) cases, II-th in 31% (n = 31), III-th in 28% (n = 28); 1 time a week and less often in the I-th group in 17% (n = 17) cases, II-th in 13% (n = 13), III-th in 10% (n = 10); 1 time per month and less often in the I-th group in 14% (n = 14) of cases, II-th in 11% (n = 11), III-th in 14% (n = 14). Analgesics were taken in group I in 68% (n = 68) of cases, II in 75% (n = 75), III in 77% (n = 77). Restrictions in daily life due to pain were experienced in group I in 57% (n = 57) of cases, II in 72% (n = 72), III in 80% (n = 80). In women, chronic pain was detected more often than in men (90 vs. 80%).
Conclusion: The importance of the staff of the MSA department has an important place in the rehabilitation of geriatric patients with CPS: conducting health schools, regular assessment of pain syndrome on scales, the use of auxiliary means for pain relief and patient adaptation. The older a person gets, the higher the frequency and intensity of the pain syndrome, but the symptoms of CPS could reduce the intake of analgesics. The low effectiveness of analgesics may be due to neuropathic and nociplastic mechanisms of pain chronization. HA and BP had the highest localization frequency. Patients observed in the department of geriatric MSA often (99%) have CPS. Patients are provided with free medicines, means of care, technical means of rehabilitation.

P260
ULTRASOUND DUPLEX VASCULAR SCANNING IN CHILDREN WITH LEG LENGTH DISCREPANCY ASSOCIATED WITH CONGENITAL VASCULAR MALFORMATIONS

A. Zyma[1], R. Viderko[1], Y. Guk[1], L. Chernuha[2], A. Cheverda[1], T. Kincha-Policschuk[1], J. E. Herzenberg[3], D. G. Steawart[4], Y. Demyan[5], S. Martsyniak[1], O. Skuratov[1]

[1]SI "The Institute of Traumatology and Orthopedics" by NAMS of Ukraine, Kyiv, Ukraine, [2]National Scientific Center of Surgery and Transplantology named after O.O. Shalimova National Academy of Sciences of Ukraine, Kyiv, Ukraine, [3]International Center for Limb Lengthening, Baltimore, USA, [4]Children's Bone And Spine Surgery, Las Vegas, USA, [5]Transcarpathian Regional Children's Hospital, Mukacevo, Ukraine

Objective: The influence of the regional blood flow disturbance on the formation of the limb length discrepancy (LLD) remains insufficiently studied in patient with CVM. We aimed to investigate changes in regional blood flow based on color duplex angioscanning (CDA) of arteries in the lower extremities and to establish their association with LLD in patients with CVM.
Methods: The study included 36 patients with CVM at two hospitals. The patients were divided according to the working classification scheme of the CVM "VASC + T": arteriovenous (AVM)—23, venous—7, capillary—4, lymphatic—2. CDA of the arteries, veins, capillaries and lymphatics of the lower extremities and soft tissues of the knee joint was performed; blood flow velocity and pulsatility index (Pi) were evaluated.
Results: LLD was diagnosed in 26 (72.2%) patients, further broken down into overgrowth of the affected limb in 21 (58.3%), and undergrowth in 5 (13.8%) patients. In patients with diffuse form of AVM, overgrowth of the affected limb was 2.76 ± 1.54 cm, with similar amounts of LLD in the femur—1.13 ± 0.55 cm; and in the tibia—1.62 ± 1.2 cm. ($p = 0.192$). In the case of diffuse form AVM, increase blood flow velocity of the posterior tibial artery, decrease in the Pi of the popliteal and posterior tibial arteries of the affected limb was found ($p = 0.05$). An increase in the total overgrowth of the affected limb with an increase blood flow velocity on the superficial femoral artery was established, as well as an increase in the elongation of the affected limb, with a decrease in Pi on the superficial femoral, popliteal and posterior tibial arteries ($p = 0.05$).
Conclusion: In patients with the diffuse form of AVM, there was a statistically significant increased blood flow velocity in the posterior tibial artery, and a decrease in the peripheral resistance (Pi) of the popliteal and posterior tibial arteries. Overgrowth of the affected limb with increase blood flow velocity on the superficial femoral artery and with decreased Pi in the superficial femoral, popliteal and posterior tibial arteries suggests a relationship between changes in regional blood circulation and LLD.

P261
IMPORTANCE OF CORRELATION BETWEEN SARCOPENIA, NUTRITIONAL STATUS AND BONE MINERAL DENSITY

A.-D. Nedelcu[1], L.-E. Stanciu[2], I. Abdula[1], A.-B. Uzun[1], D. Oprea[2], M.-G. Iliescu[3]

[1]Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol, Romania, Ovidius Univ. Faculty of Medicine Doctoral School, [2]Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol, Romania. Dept. of Medical Rehabilitation, Faculty of Medicine, Ovidius Univ. of Constanta, [3]Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol, Romania, Ovidius Univ. Faculty of Medicine Doctoral School. Dept. of Medical Rehabilitation, Faculty of Medicine, Ovidius Univ. of Constanta, Constanta, Romania

Objective: Sarcopenia can accentuate the vulnerability of the musculoskeletal system, having significant consequences on muscle and adipose tissue and involving important dysfunctions, especially in the context of association with decreased BMD.
Methods: The study carried out over 4 months (January–April 2023) included 200 patients admitted to The Balneal and Rehabilitation Sanatorium Techirghiol, evaluated by standard methods for diagnosing sarcopenia. In confirmed cases, the individuals' BMI, bone density scanning (DXA), and fracture risk (FRAX) were evaluated, and the data underwent statistical analysis.
Results: Among the 200 patients, the diagnosis of sarcopenia was confirmed in 85 patients, and 42% of them presented, by BMI calculation, sarcopenic obesity. The DXA testing performed on the 85 patients with sarcopenia, identified that 14% of the patients had osteoporosis, and 25% of them associated sarcopenic obesity. Depending on gender, 60% of women and 40% of men had sarcopenia. Sarcopenic obesity is present in 20% of women and 55% of men, and all patients with osteoporosis are female. Calculation of the FRAX score indicates that 58% of patients with osteoporosis have an increased risk of fracture. The obtained results are consistent with literature studies. The incidence of sarcopenia is increased. Women are more prone to osteoporosis and men to sarcopenic obesity. Muscle tone disorders are associated with decreased BMD. Adipose tissue confers protection on BMD. Calculating the FRAX score is important, considering the functional consequences determined by the fracture that may occur in these patients, requiring specific therapeutic measures.
Conclusion: A comprehensive assessment of the osteoarticular and muscle conditions in patients with sarcopenia is essential, considering the coexistence between muscle tissue decrease, adipose tissue excess, and the change in BMD that occurs with aging.

P262
CHALLENGES IN DIAGNOSIS: UNUSUAL MANIFESTATIONS OF SYSTEMIC SCLEROSIS—A CASE STUDY

A.-E. Minea[1], M. Minea[2], M.-L. Groşeanu[3]

[1]Carol Davila Univ. of Medicine and Pharmacy, Bucharest, [2]Ovidius Univ. Faculty of Medicine Doctoral School, Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol, Constanţa, [3]Saint Mary Clinical Hospital. Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Systemic sclerosis (SS) is a rare disease and the major key in the treatment is early diagnosis. We present a case of a 43-year-old male with acute and atypical SS onset with incomplete Raynaud and polyarticular involvement.
Casereport: The patient admitted in June 2022 to the hospital accused inflammatory pain and swelling of small joints of hands, knees, ankles, which started 2 months prior, when he suffered from a left superior lobe pneumonia. He also described paraesthesia in the hands if exposed to cold and persistent sub-febrility. From the medical history we specify: hypertension, dyslipidaemia, recurrent occurrences of pneumonia, bilateral lung nodules and hilar adenopathy which first raised suspicion of Sarcoidosis and scapulo-humeral, sternoclavicular and vertebral bone condensations suggestive for osteopoikilosis. The clinical exam underlined pain in wrists' (RCC) palpation, reduced elasticity of the fingers' skin on both hands and the left palm, discrete "puffy fingers", painful swelling in both RCC, left proximal interphalangeal (PIP) III, right PIP IV, metacarpophalangeal (MCP) III, MCP IV joints and in both ankles,

and positive patellar tap bilaterally. The investigations showed inflammatory syndrome (CRP = 12.76 mg/dl), negative anti CCP antibodies and anti SAFL anti-bodies profile, normal levels of LDH, CPK, but the extended ANA profile indicated positive anti SCL 70 antibodies, > 200 UI/ml, with negative anti-centromere, anti-dcDNA, anti-Sm anti-bodies, gamma globulins = 23%. The capillaroscopy showed nonspecific minor abnormalities. The patient was diagnosed with VEDOSS (very early diagnosis of SS), treatment with methotrexate (MTX) and prednisone was initiated, with regular monitoring. He had a positive evolution, with remitted knee arthritis after 12 weeks of MTX, thereby, prednisone was withdrawn in March 2023.

Conclusion: Our patient has a peculiar form of SS (puffy fingers, incomplete Raynaud, high levels of anti SCL 70 antibodies) with acute poli-articular onset. Still, considering the presence of anti-SCL antibodies associated with poor prognosis, close monitoring is recommended. Another particularity of the case is the association of osteopoikilosis, a rare inherited condition, this linkage of pathologies being atypical itself.

P263
DISCORDANCE BETWEEN AN INCIDENTAL FRACTURE AND DXA WITH SUPPRESSED BONE TURNOVER MARKERS AMID ALENDRONATE FOR OSTEOPOROSIS

A.-I. Trandafir[1], A.-M. Gheorghe[1], O.-C. Sima[1], A. Ghemigian[2], G. Voicu[3], E. Petrova[2]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, [3]C.I. Parhon National Institute of Endocrinology, Bucharest, Romania

The first line of treatment for osteoporosis in postmenopausal women is frequently bisphosphonates. The decision is based on guidelines, local reimbursement protocols, side effects, efficacy, patients' compliance and adherence. (1–10) We aim to present a female patient undergoing treatment for osteoporosis with discordances between incidental fractures and DXA results.

Casereport: A 63-year-old female is admitted for osteoporosis evaluation. The personal medical history includes a multinodular goiter with euthyroidism, controlled arterial hypertension, dyslipidemia, and chronic venous insufficiency. She entered menopause at 50. 2 years prior weekly alendronate was started (lumbar DXA T-score of -2.6SD). Currently, thyroid function was still normal TSH = 1.18 μUI/mL (normal: 0.5–4.5), FT4 = 14.69 pmol/L (normal: 9–19), with negative thyroid antibodies. Bone turnover markers (BTM) are suppressed in terms of formation-osteocalcin = 5.55 ng/mL (normal: 15–46), alkaline phosphatase = 42 U/L (normal: 38–105), and P1NP = 20.39 ng/mL (normal: 20.25–76.31), and resorption-CrossLaps = 0.10 ng/mL (normal: 0.33–0.782) with normal PTH = 27.86 pg/mL (normal: 15–65), and total serum calcium = 9.63 mg/dL (normal: 8.4–10.3). DXA showed an increase of lumbar L1-4T-score = − 2.2 SD, Z-score = − 0.7 SD, femoral neck T-score = − 1.3 SD, Z-score = − 0.4 SD. Yet, an incidental vertebral L2 fracture was detected at plane X-ray. Despite recommendations to switch, she opted to continue with the same regime.

Conclusion: This case highlights the gap between T-score increase and suppressed BTM, on one hand, and an incidental fracture, on the other hand under medication. Moreover, the decision of therapy is mandatory to take into consideration the patient's preference and access to a certain drug.

References:

1. Osman A, et al. Metabolites 2023;13:1192
2. Popescu AD, et al. Diagnostics 2022;12:2669
3. Tuculina MJ, et al. Rom J Oral Rehab 2022;14:78
4. Bugala NM, et al. Diagnostics 2022;12:2080
5. Bechir ES, et al. Revista de Chimie 2019;70:3515
6. Albulescu DM, et al. Revista de Chimie 2018;69:2438
7. Gheorghisan-Galateanu AA, et al. Acta Endocrinologica-Bucharest 2017;13:356
8. Sandru F, et al. Rom J Military Med 2020;123:166
9. Ghemigian A, et al. Exp Ther Med 2021;22:1219
10. Radu L, et al. Revista de Chimie 2018;69:3565

P264
AUTOIMMUNE THYROID DISEASE AND MENOPAUSAL OSTEOPOROSIS: DUAL ELEMENTS FOR A COMMON ENDOCRINE MANAGEMENT

A.-I. Trandafir[1], O.-C. Sima[1], A. Dumitrascu[2], A.-M. Gheorghe[1], E. Petrova[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology, [3]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Despite some pathogenic traits that involve autoimmune mechanisms in primary osteoporosis (a topic that is still on open issue), levothyroxine (LT4) overtreatment for autoimmune thyroid disease (ATD)-related hypothyroidism might represent an additional fracture risk during menopause.[1–10] We aim to present such a case.

Casereport: This is a 49-year-old lady known with autoimmune hypothyroidism. She was first diagnosed with myxedema 2 y prior and started LT4 replacement. After 6 months since LT4 initiation, overtreatment was confirmed based on TSH = 0.03 μUI/mL (Normal: 0.5–4.5). Since she entered spontaneous menopause by the age of 42, DXA scan was done and confirmed osteoporosis: lumbar L1–4 BMD = 0.877 g/cm^2, T-score = − 2.5 SD, Z-score = − 1.6 SD; femoral neck BMD = 748 g/cm^2, T-score = − 2.1 SD, Z-score = − 1 SD. She also associated at that point a high bone turnover as reflected by serum P1NP = 89.3 ng/mL (Normal: 20.25–76.31), and CrossLaps = 0.719 ng/mL (Normal: 0.162–0.436). Opportunity window for hormone (estrogens) replacement therapy was considered out, thus anti-osteoporotic medication was recommended, which the patient refused and she continued with cholecalciferol 1000–2000 UI/d and a mildly reduced dose of LT4. Currently, thyroid function is normal: TSH = 1.69 μUI/mL and FT4 = 15.92 pmol/L (Normal: 9–19) under T4 therapy 100 μg/d. A mild vitamin D deficiency is revealed by 25-hydroxyvitaminD = 21.6 ng/mL (Normal > 30) with normal serum calcium and PTH, as well as still increased P1NP = 90.4 ng/mL, and CrossLaps = 0.556 ng/mL. BMD continued to decrease: L1–4 BMD = 0.805 g/cm^2, T-score = − 3.1 SD, Z-score = − 2.1 SD; total hip BMD = 0.726 g/cm^2, T-score = − 2.2 SD, Z-score = − 1.3 SD. Hence, oral twice monthly risedronate was offered in addition to 2000 IU/d cholecalciferol and LT4 replacement.

Conclusion: Overtreatment with LT4 for ATD represents a synchronous element to concur to bone loss in association with early menopause. Adherence to anti-osteoporosis medication and its early initiation might help the overall bone status.

References:

1. Ghemigian A, et al. Exp Ther Med 2022;23:88
2. Sandru F, et al. Exp Ther Med 2021;22:756
3. Nicola AG, et al. Diagnostics 2022;12:2168

4. Bugala NM, et al. Diagnostics 2022;12:2080
5. Albulescu DM, et al. Revista de Chimie 2018;69:2438
6. Gheorghisan-Galateanu AA, et al. JPMA 2017;67:917
7. Popescu AD, et al. Diagnostics 2022;12:2669
8. Tuculina MJ, et al. Rom J Oral Rehab 2022;14:78
9. Osman A, et al. Metabolites 2023;13:1192
10. Bechir ES, et al. Revista de Chimie 2019;70:3515

P265
IMPACT OF COVID-19 PANDEMIC RESTRICTIONS: ONE STEP FORWARD IN TAKING THE DECISION OF BISPHOSPHATES DRUG HOLIDAY?

A.-I. Trandafir[1], O.-C. Sima[1], A. Dumitrascu[2], A.-M. Gheorghe[1], E. Petrova[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology, [3]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Restrictions amid COVID-19 pandemic limited the access to periodic checkup in some instances or the patients voluntarily avoided medical evaluations for prior chronic conditions, including the subjects being under specific medication against osteoporosis.[1–10] We aim to introduce a female patient that stopped her therapy for osteoporosis under these specific circumstances.

Casereport: This is a 62-year-old woman who received monthly alendronate and oral vitamin D for 5 y; she started at the lowest T-score at lumbar spine of − 2.6 SD followed by a 3-y treatment gap amid COVID-19 pandemic. She associated chronic Hashimoto's thyroiditis with controlled hypothyroidism under daily levothyroxine replacement and hypercholesterolemia. She had spontaneous menopause at the age of 50. Her medical family history also included her mother with menopausal osteoporosis. The latest prepandemic assessment included central DXA: lumbar L1–4: BMD of 0.862 g/cm^2, T-score of − 2.6SD, Z-score of − 1.8SD; total hip BMD of 0.862 g/cm^2, T-score of − 1.3, Z-score of − 0.3SD. After 3-y drug holiday, she was reassessed and blood assays showed adequate thyroid hormone substitution with normal TSH of 3.17 µUI/mL (normal: 0.5–4.5) in association with a mild vitamin D insufficiency in terms of 25-hydroxyvitamin D of 26 ng/mL (normal > 30), normal total serum calcium (9.1 mg/dL, normal: 8.4–10.2), and PTH (31.72 pg/mL, normal: 15–65), and nonsuppressed bone turnover markers. No incidental fracture was detected at plane lumbar-thoracic profile X-ray. Lumbar BMD-DXA decreased at 0.833 g/cm^2, T-score of − 2.8SD, Z-score of − 1.9SD; but not total hip BMD of 0.862 g/cm^2, T-score of − 1.3, Z-score of − 0.2SD. It was decided to resume taking weekly alendronate and continue with vitamin D replacement (2000 UI/d), and similar levothyroxine doses, respectively.

Conclusion: Frequent monitoring of osteoporosis is essential, while establishing the adherence to medical recommendations is also mandatory, particularly when taken into consideration the potential impact of COVID-19 pandemic to regular assessments.

References:

1. Popescu M, et al. Revista de Chimie 2018;69:2089
2. Gheorghisan-Galateanu AA, et al. Acta Endocrinologica-Bucharest 2017;13:356
3. Bechir ES, et al. Revista de Chimie 2019;70:3515
4. Bugala NM, et al. Diagnostics 2022;12:2080
5. Osman A, et al. Metabolites 2023;13:1192
6. Popescu AD, et al. Diagnostics 2022;12:2669
7. Albulescu DM, et al. Revista de Chimie 2018;69:2438
8. Nicola AG, et al. Diagnostics 2022;12:2168
9. Tuculina MJ, et al. Exp Ther Med 2022;23:288
10. Radu L, et al. Revista de Chimie 2018;69:2754

P266
PITFALLS OF SEQUENTIAL THERAPY IN LONG TERM MENOPAUSAL OSTEOPOROSIS

A.-I. Trandafir[1], A.-M. Gheorghe[1], E. Petrova[2], O.-C. Sima[1], A. Dumitrascu[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, [3]C.I. Parhon National Institute of Endocrinology, Bucharest, Romania

Long term osteoporosis requires a complicate sequence of therapy across menopausal life span and prior second- or even third line medication such as strontium ranelate (SR) might be found in one individual' medical history.[1–10] Our purpose is to introduce such case of complicated osteoporosis management.

Casereport: This is a 63-year-old female patient admitted for the assessment of thyroid and bone status. Her medical history consists of benign thyroid nodules, gastroesophageal reflux disease, vitamin D deficiency, and osteoporosis. She entered menopause at 50. More than a decade ago, she was treated with SR for 4 y. At first evaluation, DXA confirmed osteoporosis: L1–L4 BMD = 0.748 g/cm^2,T-score = − 3.6SD, Z-score = − 2.3SD, total hip BMD = 0.638 g/cm^2, T-score = − 3SD, Z-score = − 2SD with an improvement after 4 y to L1–4 BMD = 0.821 g/cm^2, T-score = − 3SD, Z-score = − 1.3SD, total hip BMD = 0.702 g/cm^2, T-score = − 2.4SD, Z-score = − 0.9 SD, but she suffered a double patellar fracture that was considered a fragility fracture. After stopping SR for a few years, she re-stated therapy with intravenous ibandronate every 3 months and achieved a mild suppression of bone formation marker osteocalcin = 14.96 ng/mL (normal:15–46), and resorption marker CrossLaps = 0.26 ng/mL (normal:0.33–0.782) with an increase of T-score to − 2.4SD at lumbar DXA after 1 y. Currently, thyroid function is normal with stationary ultrasound traits, as well as mineral metabolism, including PTH = 32.64 pg/mL (normal:15–65) and 25-hydroxyvitamin D. Bone turnover markers remained suppressed after another year of the same drug: osteocalcin = 12.94 ng/mL, P1NP = 15.39 ng/mL (normal:20.25–76.31), and CrossLaps = 0.18 ng/mL, but a decreased of BMD-DXA in terms of L1–L4 BMD = 0.866 g/cm^2, T-score = − 2.6SD, Z-score = − 0.8SD, total hip BMD = 0.7 g/cm^2, T-score = − 2.4SD, Z-score = − 0.8SD. A switch to yearly 5 mg zoledronate was done, despite not having an incidental vertebral fracture, in addition to vitamin D supplementation.

Conclusion: SR might not be a current first line option, but this may represent a part of an otherwise complicated picture of long time therapy for osteoporosis.

References:

1. Ghemigian A, et al. Exp Ther Med 2021;22:1219
2. Popescu M, et al. Diagnostics 2022;12:960
3. Sandru F, et al. Rom J Military Med 2020;123:166
4. Albulescu DM, et al. Revista de Chimie 2018;69:2438
5. Tuculina MJ, et al. Exp Ther Med 2022;23:288
6. Nicola AG, et al. Diagnostics 2022;12:2168
7. Bugala NM, et al. Diagnostics 2022;12:2080

8. Osman A. et al. Metabolites 2023;13:1192
9. Bechir ES, et al. Revista de Chimie 2018;69:3565
10. Popescu AD, et al. Diagnostics 2022;12:2669

P267
BILATERAL NODULAR ADRENOCORTICAL DISEASE AND DECISION MAKING FOR ANTIOSTEOPOROTIC MEDICATION

A.-I. Trandafir[1], E. Petrova[2], A.-M. Gheorghe[1], O.-C. Sima[1], A. Dumitrascu[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, [3]C.I. Parhon National Institute of Endocrinology, Bucharest, Romania

One-third of apparently non-secreting adrenal tumors (NSAT) associate autonomous cortisol secretion (ACS) with negative bone impact. Whether bilateral adrenal involvement is more prone than unilateral disease for this issue is yet an open matter.[1–5] We aim to introduce a female with NSAT and osteoporosis including strategic decisions such as drug holiday (DH) and teriparatide (TPT) transition.

Casereport: This is an 83-year-old female who was admitted for an adrenal and bone evaluation. Her medical history includes menopause at 44 and osteoporosis since the age of 67. She was diagnosed with bilateral sporadic nodular adrenocortical disease (largest diameter of the right tumor = 2.73 cm, respectively, of 1.86 cm on the left) with inconsistent suppression of post-dexamethasone test-based morning cortisol (values between 1 and 5 μg/dL over the years). She was treated with alendronate for 6 y; DXA results with lowest values at lumbar spine: L1–4 BMD = 0.812 g/cm^2, T-score = − 2.9SD, Z-score = − 1SD. Following 1 y DH, she resumed alendronate for 2 y followed by 2-y TPT. TPT was started at DXA showing lumbar bone loss to BMD = 0.75 g/cm^2, T-score = − 3.5SD, Z-score = − 1.9SD; but not at femoral neck BMD = 0.735 g/cm^2, T-score = − 2.2SD, Z-score = − 0.3SD. After 2-y TPT, no incidental fracture was detected, bone turnover markers (BTM) were normal: osteocalcin = 28.7 ng/mL (Normal:15–46), CrossLaps = 0.278 ng/mL (Normal:0.33–0.782), as well as PTH = 24.09 pg/mL (Normal:15–65). DXA improved to: L1–4 BMD = 0.917 g/cm^2, T-score = − 2.1SD, Z-score = − 0.2SD; femoral neck BMD = 0.814 g/cm^2, T-score = − 1.6SD, Z-score = 0.5SD. She continued with IV ibandronate then self-decided to take a 1-y break followed by drug resumption. Currently, a normal phosphorus-calcium profile is confirmed, including formation BTMs: osteocalcin = 18.21 ng/mL, and P1NP = 25.71 ng/mL (Normal: 20.25–76.31), and suppressed resorption BTM CrossLaps = 0.28 ng/mL. While novel fractures were not identified, T-score remained decreased (but did not reach the best nadir) of − 2.8 (lumbar), and − 2.6 (femoral neck). Low TBS confirmed a degraded microarchitecture (1.098).

Conclusion: No genetic testing was feasible for NSAT, neither adrenal venous sampling; anyway, the patient did not take into consideration an adrenalectomy, while the adrenal imaging features remained stationary during bone surveillance and associated challenges.

References:

1. Nicola AG, et al. Diagnostics 2022;12:2168
2. Osman A, et al. Metabolites 2023;13:1192
3. Popescu M, et al. Diagnostics 2022;12:960
4. Bechir ES, et al. Revista de Chimie 2018;69:3565
5. Popescu AD, et al. Diagnostics 2022;12:2669

P268
BONE MICROSTRUCTURE CASE STUDY: TRABECULAR BONE SCORE IN DIABETES-RELATED BONE FRAGILITY AMID MENOPAUSE

A.-I. Trandafir[1], D.-E. Barbulescu[2], C.-T. Visan[2], A.-M. Gheorghe[1], O.-C. Sima[1], E. Petrova[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology, [3]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Type 2 diabetes mellitus (DM) has a major epidemiologic impact thus any complication that increases the disease burden should be taken into consideration very early such as bone fragility. DM impacts bone microarchitecture, as reflected by TBS, in addition to the bone loss resulting from menopausal state. [1–5] Our purpose is to introduce such a case.

Casereport: A 59-year-old lady was reassessed for bone health since 1 y prior she received an osteoporosis diagnosis [DXA showed lumbar (L1–4) BMD = 0.871 g/cm^2, T-score = − 2.5, Z-score = − 2.5, with a low TBS = 1.044; femoral neck BMD = 0.890 g/cm^2, T-score = − 1.1, Z-score = − 0.6]. Weekly oral alendronate was started. Moreover, she had a history of postsurgical hypothyroidism (for a benign condition), arterial hypertension, dyslipidemia, type 2 insulin-dependent DM, and mixed anxiety-depressive disorder. On current admission, uncontrolled hypothyroidism [TSH = 40.42 μUI/mL (normal:0.5–4.5), FT4 = 5.41 pmol/L (normal:9–19) under LT4 50 μg/d] and DM [fasting glycaemia = 198 mg/dL (normal:70–100), and glycated hemoglobin A1c = 7.8% (normal < 5.9)] are detected. Mineral metabolism is normal: total serum calcium = 10 mg/dL (normal:8.4–10.3), phosphorus = 2.94 mg/dL (normal:2.5–4.5), PTH = 22.76 pg/mL (normal:15–65), except for suppressed osteocalcin = 6 ng/mL (normal:15–46), and CrossLaps = 0.091 ng/mL (normal:0.33–0.782). BMD increased to L1–4 BMD = 0.904 g/cm^2, T-score = − 2.3, Z-score = − 2.2, and femoral neck BMD = 0.874 g/cm^2, T-score = − 1.2, Z-score = − 0.5. She continued with the same regime including 1000 UI/d cholecalciferol that allowed a normal 25-hydroxyvitamin D in addition to adjustment of LT4 and insulin dose.

Conclusion: Despite poor glycemic control, DXA-BMD and TBS results improved showing that specific anti-osteoporotic medication might act against menopause-related and DZ-associated components, as well. In this case, long-term medication for mixed anxiety-depressive disorder might become an additional fracture risk.

References:

1. Popescu M, et al. Diagnostics 2022;12:960
2. Tuculina MJ, et al. Rom J Oral Rehab 2022;14:78
3. Popescu AD, et al. Diagnostics 2022;12:2669
4. Osman A, et al. Metabolites 2023;13:1192
5. Bechir ES, et al. Revista de Chimie 2018;69:3565

P269
BISPHOSPHONATES HOLIDAY: BETWEEN PATIENT'S COMPLIANCE AND REIMBURSEMENT PROTOCOLS

A.-I. Trandafir[1], C.-T. Visan[2], D.-E. Barbulescu[2], A.-M. Gheorghe[1], O.-C. Sima[1], E. Petrova[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology, [3]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Bisphosphonates holiday (BPH) is recommended in low-risk osteoporosis or high-risk side effects to specific drugs against osteoporosis. Under certain circumstances a pseudo-holiday means that the patient was no longer compliant, neither the individual had access to prescription.[1–5] Our purpose is to introduce a female who underwent a total thyroidectomy due to a benign thyroid disease and has a long history of osteoporosis.

Casereport: A 79-year-old female is hospitalized for a thyroid and bone status evaluation. She associates hypothyroidism following total thyroidectomy for a benign multinodular goiter, chronic ischemic cardiomyopathy, and controlled arterial hypertension. She had spontaneous menopause at the age of 50. The bone assessment started 2 decades prior when she was identified with osteopenia and followed intermittent vitamin D supplementation; then, at 66, she started oral monthly 150 mg ibandronate for 2 y with a BMD improvement, hence, a BPH was recommended for 1 y and self-continued for another 2 y (calcium and vitamin D were intermittently administered) since the patient did not come to be assessed. A decision of resuming ibandronate for another year was done, and then switched to alendronate for 5 more years due to reimbursing protocol based access. An improvement of BMD-DXA was confirmed [(L1–L4)BMD = 1053 g/cm^2, T-score = − 1.1, Z-score = − 0.6; femoral neck BMD = 0.713 g/cm^2, T-score = − 2.3, Z-score = − 0.4] and, since the subject had no fragility fracture, BPH was decided once again. After 2 more years, BMD lumbar BMD decreased (0.959 g/cm^2, T-score = − 1.7, Z-score = − 0.1), while femoral neck BMD did not (0.806 g/cm^2, T-score = − 1.7, Z-score = − 0.3). The thyroid panel continued to be normal [TSH = 1.58 μUI/mL (normal:0.5–4.5)] under LT4 with normal mineral metabolism and adequate vitamin D levels in terms of 25-hydroxyvitamin D = 32.4 mg/dL. At this point, bone turnover markers(BTM) panel remained suppressed [osteocalcin = 9.55 ng/mL (normal:11–46), CrossLaps = 0.131 ng/mL (normal:0.33–0.782)], but, due to lumbar BMD trend, a decision of resuming the antiresorptive drug was done.

Conclusion: Discordances between BMD changes at different central DXA sites or between BMD decrease and BMTs' suppressed profile makes the decision of prolonging BPD more difficult. Due to long standing history of sequential treatment against osteoporosis, a personalized medicine remains the main clue of real-life clinical approach.

References:

1. Tuculina MJ, et al. Rom J Oral Rehab 2022;14:78
2. Popescu M, et al. Diagnostics 2022;12:960
3. Osman A, et al. Metabolites 2023;13:1192
4. Bechir ES, et al. Revista de Chimie 2018;69:3565
5. Popescu AD, et al. Diagnostics 2022;12:2669

P270
NOT TAKING VITAMIN D IS THE MAIN REASON FOR ITS DEFICIENCY IN THE POPULATION (REVIEW OF HOSPITAL MATERIAL)

A.-M. Borissova[1], L. Trifonova[1], E. Mollova[1], J. Vlahov[1], R. Mekova.[1]

[1]Sofia Univ. St Kliment Ohridski, Sofia, Bulgaria

Objective: The level of vitamin D in the Bulgarian population depends on various risk factors and seasonal dynamics, but also on the traditions of regular intake of this vitamin. We aimed to investigate the relationship between vitamin D deficiency and the available risk factors, the role of the season and the regularity of vitamin D substitution.

Methods: 199 patients who were regularly admitted to the Clinic of Endocrinology, University Hospital Sofiamed were examined on a random basis. with the mandatory condition being to have a tested level of vitamin D [25(OH)D] using a standard assay in a central laboratory on the day of the sampling.

Results: 74.5% of the examined patients have a BMI > 25 kg/m^2. For the entire group, the average level of eGFR is 81.24 ml/min; eGFR < 60 ml/min had 15.6%, which are similar to the general population. With gastrointestinal resp. liver diseases are 43%, and 15% take antidepressants. The level of vitamin D in general for both seasons and separately for winter and summer was low: 23.49 ± 10.861 ng/ml, winter—19.68 ± 8.65 ng/ml, summer—27.04 ± 11.48 ng/ml, $p < 0.001$. Distribution of patients according to the level of vitamin D: Normal (≥ 30 ng/ml)—54 (27.1%); Insufficient (10–30 ng/ml)—125 (62.8%); Deficiency (< 10 ng/ml) – 20 (10.1%). Only 58 (29.1%) patients take vitamin D, the remaining 141 (70.9%) do not. The patients who do not take vitamin D (141, 70.9%) are divided into two groups—never took it—38 (27%) and did not take it for "months"—103 (73%). From the group of patients taking vitamin D (58, 29.1%)—11 (19%) take 1000 IU/d and 47 (81%) take 1000–4000 IU/day.

Conclusion: There are several risk factors that determine a low level of vitamin D. Seasonality also has an expected effect. The most important cause of vitamin D deficiency remains the lack of systemic substitution among the population, which is clearly reflected in the hospitalized patients—71% do not take and of them 27% have never taken vitamin D. The medical community faces a very important task—education and creating traditions in vitamin D substitution that will have important population health implications.

P271
INCIDENTAL TOXIC MULTINODULAR GOITRE DURING BISPHOSPHONATES DRUG HOLIDAY: INTERFERENCES WITH RESUMPTION OF ANTI-OSTEOPOROTIC REGIME

A.-M. Gheorghe[1], A.-I. Trandafir[1], A. Ghemigian[2], O.-C. Sima[1], G. Voicu[3], E. Petrova[2]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, [3]C.I.Parhon National Institute of Endocrinology, Bucharest, Romania

Hyperthyroidism (even mild) may increase bone loss and complicate the outcome in patients on bisphosphonates drug holiday.[1–10] We aim to introduce such a case.

Casereport: A 70-year-old patient known with osteoporosis for prior 6 y, for which she had been treated with bisphosphonates for 3 y (alendronate for 1 y, respectively, 2 more years of oral ibandronate) followed by a 3-y drug holiday was admitted for suspected thyrotoxicosis. She entered menopause of 56. She associated controlled high blood pressure and continued with daily 1000 UI cholecalciferol for the last years. Initial DXA showed: lumbar L1–L4 BMD = 0.781 g/cm^2, T-score = − 3.2, Z-score = − 1.4, total hip BMD = 0.758 g/cm^2, T-score = − 2, Z-score = − 0.3. On current admission, subclinical hyperthyroidism is confirmed: TSH = 0.03 μUI/mL (Normal:0.5–4.5), freeT4 (thyroxine) = 17.8 pmol/L (Normal:9–19) with negative thyroid antibodies; thyroid ultrasound showed multinodular goiter with the largest nodule of 3.3 cm. Vitamin D deficiency was identified: 25-hydroxivitamin D = 9.83 ng/mL (Normal > 30) with normal (nonsuppressed) bone turnover markers: of resorption-CrossLaps = 0.549 ng/mL (Normal:0.33–0.78), and of formation osteocalcin = 23.46 ng/mL (Normal:15–46), and alkaline phosphatase = 64 U/L (40–150). Initial lumbar T-score (premedication) of − 3.2 improved at drug holiday initiation and currently remained so: DXA based lumbar L1–L4 BMD = 0.876 g/cm^2, T-score = − 2.5,

Z-score = − 0.6, total hip BMD = 0.732 g/cm^2, T-score = − 2.2, Z-score = − 0.5. No prevalent fracture was found on plane spine X-ray. A decision of starting anti-thyroid medication (thiamazole 10 mg/d) was associated with increased vitamin D replacement (2000 UI/d) and resumption of oral bisphosphonates due this thyroid-related risk factor.

Conclusion: Despite favourable evolution during drug holiday in terms of DXA and no incidental fracture (yet, with no suppression of bone turnover markers), resuming bisphosphonate treatment may be taken into consideration in selected patients with other risk factors such as subclinical hyperthyroidism.

References:

1. Osman A, et al. Metabolites 2023;13:1192
2. Bugala NM, et al. Diagnostics 2022;12:2080
3. Bechir ES, et al. Revista de Chimie 2019;70:3515
4. Popescu AD, et al. Diagnostics 2022;12:2669
5. Gheorghisan-Galateanu AA, et al. Acta Endocrinologica-Bucharest 2017;13:356
6. Tuculina MJ, et al. Rom J Oral Rehab 2022;14:78
7. Ghemigian A, et al. Exp Ther Med 2022;23:88
8. Sandru F, et al. Exp Ther Med 2021;22:756
9. Nicola AG, et al. Diagnostics 2022;12:2168
10. Albulescu DM, et al. Revista de Chimie 2018;69:3683

P272
SINGLE VERTEBRAL FRACTURE IN A PATIENT WITH HISTORY OF LOCAL RADIATION TERAPY

A.-M. Gheorghe[1], A.-I. Trandafir[1], A. Dumitrascu[2], O.-C. Sima[1], E. Petrova[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology, [3]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Ionizing radiation used during treatment of various types of cancers, including uterine carcinoma, may alter bone microarchitecture and, hence, increase the risk of fragility fractures.[1–10] We aim to introduce the case of a patient with osteoporosis and a history of radiation.

Casereport: A 70-year-old woman was admitted for bone status assessment due to intermittent non-specific bone pain for the last months. Her medical history included pelvic radiation therapy (cobalt therapy and brachytherapy) for uterine cancer 20 y prior (and menopause by the same age). A contrast computed tomography exam performed 5 y prior identified herniated L4–L5, and L5-S1 discs, and a vertebral fracture at lumbar L5 level. Central DXA showed osteopenia (the lowest T-score was at lumbar spine of 1.1SD). She did not continue investigations; neither started any drug against osteoporosis and followed intermittent vitamin D therapy. On current admission, bone turnover markers showed normal, as follows: resorption marker CrossLaps = 0.68 ng/mL (normal: 0.33–0.78), and formation marker osteocalcin = 20.29 ng/mL (normal: 15–46). Central DXA (GE Lunar Prodigy device) confirmed osteoporosis based on: L1–L4 BMD = 0.856 g/cm^2, T-score = − 2.6, Z-score = − 0.4, femoral neck BMD = 0.738 g/cm^2, T-score = − 2.2, Z-score = − 0.2. No other secondary cause of osteoporosis was identified, except for a mild vitamin D deficiency: 25-hydroxivitamin D = 28.5 ng/mL. Despite no incidental fracture was detected, and the patient remained on remission for her prior malignancy, oral monthly alendronate was recommended in addition to daily cholecalciferol 2000 UI/d, 3 months followed by 1000 UI/d.

Conclusion: Whether local bone effects in terms of single vertebral fracture are due to radiation therapy or this stands as solitary complication amid primary osteoporosis is difficult to be distinguished; yet, specific therapy against osteoporosis might help.

References:

1. Ghemigian A, et al. Exp Ther Med 2021;22:1219
2. Bechir ES, et al. Revista de Chimie 2019;70:3515
3. Sandru F, et al. Rom J Military Med 2020;123:166
4. Popescu M, et al. Revista de Chimie 2018;69:2089
5. Popescu AD, et al. Diagnostics 2022;12:2669
6. Gheorghisan-Galateanu AA, et al. J Pakistan Med Assoc 2017;67:917
7. Albulescu DM, et al. Revista de Chimie 2018;69:2438
8. Osman A, et al. Metabolites 2023;13:1192
9. Bugala NM, et al. Diagnostics 2022;12:2080
10. Nicola AG, et al. Diagnostics 2022;12:2168

P273
PRIOR HISTORY OF GRAVES' DISEASE: IS THERE A CLUE FOR BONE FRAGILITY?

A.-M. Gheorghe[1], A. Dumitrascu[2], O.-C. Sima[1], A.-I. Trandafir[1], E. Petrova[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology, [3]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Long term uncontrolled hyperthyroidism may lead to loss of cortical bone mass and probably sarcopenia in a selected subgroup of patients, particularly seniors. Adequate anti-thyroid treatment is essential for reducing fracture risk in these patients.[1–10] We aim to introduce a case of osteopenia in a patient with a long history of partially controlled Graves' disease and an incidental spontaneous vertebral fracture.

Casereport: A 65-year-old patient was diagnosed with Graves' disease 15 y prior; over the years, she was partially compliant to the recommendations and the condition' evolution highlighted several episodes of remission and relapse. She entered physiological menopause by the age of 50; her medical family history is irrelevant. Currently, she complains of nonspecific myalgia. The patient had been treated with methimazole, but stopped taking her medication one year prior to this presentation. Her thyroid evaluation showed normal spontaneous thyroid function: TSH = 0.9 μUI/mL (normal:0.5–4.5), freeT4 = 9.93 pmol/L (normal:9–19); thyroid ultrasound revealed micronodular hypoechoic pattern. She has positive TSH receptor antibodies (TRAb) = 2.97 UI/L (normal < 1.75), but also anti-thyroperoxidase antibodies (TPO) = 158 UI/mL (normal < 35). Bone turnover markers were mildly suppressed: CrossLaps = 0.209 ng/mL (0.33–0.78), osteocalcin = 13.69 ng/mL (15–46). DXA revealed osteopenia with lowest T-score at femoral neck: lumbar L1–L3 BMD of 1.364 g/cm^2, T-score = 1.7SD, Z-score = 3SD, femoral neck BMD of 0.826 g/cm^2, T-score = − 1.5SD, Z-score = − 0.2SD. An incidental mild lumbar L4 fracture was confirmed at screening X-ray. The patient received treatment with 2000 UI of vitamin D due to suboptimal levels [25-hydroxivitamin D = 27.5 ng/mL (normal ≥ 30)] for 3 months with myalgia improvement followed by a dose reduction and started oral bisphosphonates.

Conclusion: The combination of positive serum stimulating (TRAb) and blocking thyroid antibodies (TPO) might be a clue for episodes of spontaneous thyroid function normalization alternatively with thyrotoxicosis relapse that (if left untreated) might contribute to an

increased fracture risk. Muscle complains may accompany a thyroid dysfunction or hypovitaminosis D.

References:

1. Bugala NM, et al. Diagnostics 2022;12:2080
2. Albulescu DM, et al. Revista de Chimie 2018;69:2438
3. Tuculina MJ, et al. Exp Ther Med 2022;23:288
4. Nicola AG, et al. Diagnostics 2022;12:2168
5. Popescu M, et al. Diagnostics 2022;12:960
6. Osman A, et al. Metabolites 2023;13:1192
7. Popescu AD, et al. Diagnostics 2022;12:2669
8. Radu L, et al. Revista de Chimie 2018;69:2754
9. Bechir ES, et al. Revista de Chimie 2018;69:3565
10. Gheorghisan-Galateanu AA, et al. J Pakistan Med Assoc 2017;67:917

P274
BONE STATUS AFTER FOUR YEARS OF BIPHOSPHONATE DRUG HOLIDAY

A.-M. Gheorghe[1], A.-I. Trandafir[1], O.-C. Sima[1], A. Dumitrascu[2], E. Petrova[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology, [3]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Bisphosphonates drug holiday (DH) is chosen to reduce risk of atypical fractures in selected cases. Assessing fracture risk during HD is important for taking the decision to resume treatment if needed. Sometimes this decision is a matter of individual management rather than general guideline.[1–9] We introduce a female with a 4-y DH.

Casereport: A 78-year-old lady was admitted for bone status assessment after 4 y of DH. Her medical history included total thyroidectomy for Graves' disease associated with a papillary thyroid carcinoma, and premature menopause at 38 (no replacement therapy). The patient had been treated with bisphosphonates for 7 y (risedronate for 3 y, IV ibandronate for 2 y, and alendronate for 2 y) with an increase of bone mass. Her DXA after 7 y showed: lumbar L1–L4 BMD = 0.977 g/cm^2, T-score = − 1.7, Z-score = 0.5, femoral neck BMD = 0.673 g/cm^2, T-score = − 1.6, Z-score = − 0.4. After 1-y DH, bone turnover markers (BTM) remained suppressed: CrossLaps = 0.22 ng/mL (normal:0.33–0.78), osteocalcin = 14 ng/mL (normal:15–46), while DXA showed similar results: 3% lumbar BMD loss (< LSC). She only returned for a checkup amid early post-pandemic months (after a total 4-y DH), BTM were still decreased: CrossLaps = 0.31 ng/mL, osteocalcin = 13.16 ng/mL. DXA remained stationary: L1–L4 BMD = 0.947 g/cm^2, T-score = − 2, Z-score = 0.4. Of note, she continued to have adequate 25-hydroxyvitamin D levels under supplementation, a mild TSH suppression therapy with oral thyroxine for her prior thyroid malignancy, while she had no fracture. A decision of prolonging DH was done with indication of 1-y reassessment.

Conclusion: No incidental fracture, suppressed BTM, and stationary DXA-BMD might be convincing elements for prolonged DH despite TSH suppression therapy and early menopause in a osteoporotic senior.

References:

1. Bugala NM, et al. Diagnostics 2022;12:2080
2. Tuculina MJ, et al. Exp Ther Med 2022;23:288
3. Nicola AG, et al. Diagnostics 2022;12(9):2168
4. Popescu M, et al. Rom J Morphol Embryol 2022;63:39
5. Popescu M, et al. Diagnostics 2022;12:960
6. Osman A, et al. Metabolites 2023;13:1192
7. Popescu AD, et al. Diagnostics 2022;12:2669
8. Bechir ES, et al. Revista de Chimie 2018;69:3565
9. Trandafir AI, et al. J Clin Med 2023;12:7399

P275
HYPOTHYROIDISM FOLLOWING THYROID SURGERY FOR A DIFFERENTIATED THYROID CARCINOMA: BONE HEALTH CONSIDERATIONS

A.-M. Gheorghe[1], E. Petrova[2], A.-P. Cucu[3], A.-I. Trandafir[1], A. Ciuche[4], O.-C. Sima[1], C. Nistor[4]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, [3]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & Thoracic Surgery Dept., "Dr. Carol Davila" Central Military Emergency Univ. Hospital, [4]Thoracic Surgery Dept., "Dr. Carol Davila" Central Military Emergency Univ. Hospital & Thoracic Surgery II Discipline, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Papillary thyroid carcinoma increases the risk of osteoporosis, but it is unclear whether the effect is sole due to TSH-suppressive therapy. Even though hypothyroidism reduces bone turnover, there is insufficient data regarding a possible correlation with BMD and fracture risk.[1–5] We aim to introduce a case of osteoporosis in a patient with overt hypothyroidism caused by thyroidectomy for a differentiated thyroid carcinoma.

Casereport: A 57-year-old lady was admitted for a planned thyroid and bone evaluation. Her medical history included total thyroidectomy for differentiated thyroid carcinoma, vitamin D deficiency treated with 2000 UI daily for the past 3 y, and osteoporosis at central DXA (GE Lunar Prodigy device): lumbar L1–L4 BMD of 0.959 g/cm^2, T-score of − 2, Z-score of − 1.3, left femoral neck BMD of 0.664 g/cm^2, T-score of − 2.7, Z-score of − 1.7. She was not compliant to any anti-osteoporotic drug. On current admission, the thyroid panel showed insufficient treatment with levothyroxine 100 μg/d: TSH of 26.95 μUI/mL (normal: 0.5–4.5), freeT4 (thyroxine) of 8.73 pmol/L (normal: 9–19). Bone turnover markers showed reduced resorption and formation: CrossLaps of 0.32 ng/mL (normal: 0.33–0.78), respectively, osteocalcin of 15.9 ng/mL (normal: 15–46). Her 25-hydroxyvitamin D level was 43.7 ng/mL (normal: 30–100). DXA showed loss of bone mass: lumbar L1–L4 BMD of 0.962 g/cm^2, T-score of − 2, Z-score of − 1.1, left femoral neck BMD of 0.612 g/cm^2, T-score of − 3.1, Z-score of − 2. The patient received treatment with 5 mg annual zoledronate, and her levothyroxine dose was gradually increased with lifelong follow-up.

Conclusion: Whether thyroid carcinoma and associated management is an independent risk factor for osteoporosis and the influence of hypothyroidism on bone metabolism remain open issues.

References:

1. Osman A, et al. Metabolites 2023;13:1192
2. Popescu AD, et al. Diagnostics 2022;12:2669
3. Bechir ES, et al. Revista de Chimie 2018;69:3565
4. Trandafir AI, et al. J Clin Med 2023;12:7399
5. Popescu M, et al. Diagnostics 2022;12:960

P276
THALASSEMIC ENDOCRINE DISEASE: THALASSEMIA BONE DISEASE IN A PATIENT WITH MINOR BETA TYPE

A.-M. Gheorghe[1], A.-L. Ioan[2], A.-I. Trandafir[1], O.-C. Sima[1], E. Petrova[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology, [3]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Thalassemic endocrine disease is challenging; a distinct subgroup with minor type might display similar traits with major thalassemia. In patients with beta thalassemia the development of osteoporosis is multifactorial and it includes vitamin D deficiency. In addition, poor compliance to treatment may worsen the outcome.[1–5] We aim to introduce a case of osteoporosis in a patient with minor thalassemia and persistent vitamin D deficiency.

Casereport: This is an 82-year-old female patient admitted for a bone status assessment. Her medical history included minor thalassemia and one year of glucocorticoid treatment for chronic obstructive pulmonary disease. She was known with osteoporosis and severe vitamin D deficiency (25-hydroxivitamin D of 7.32 ng/mL, normal: 30–100), with consequent secondary hyperparathyroidism (PTH of 65.39 pg/mL, normal: 15–65) for 4 y, but had abandoned alendronate and vitamin D treatment after first year. On admission, she had persistent vitamin D deficiency (25-hydroxivitamin D = 7.48 ng/mL, normal: 30–100), and secondary hyperparathyroidism (PTH of 67.62 pg/mL, normal: 15–65). DXA was inconclusive for the lumbar region due to multiple low-trauma vertebral compression fractures and showed hip osteopenia scores: total hip BMD of 0.746 g/cm^2, T-score of − 2.1, Z-score of − 0.4. Serum bone turnover markers showed reduced resorption: CrossLaps of 0.28 ng/mL (normal: 0.33–0.78) with normal bone formation markers such as osteocalcin of 19.40 ng/mL (normal: 15–46). The patient received treatment with vitamin D 2000 UI daily and alphacalcidol 1 μg daily. She refused any specific medication against osteoporosis.

Conclusion: Patient's adherence to anti-osteoporosis medication might be impaired by the multiple comorbidities and associated drugs. There is a need for further research focused on the impact of minor thalassemia on bone metabolism. Modern perspective stands for thalassemia bone disease typically involving the major type, but minor thalassemia might be taken into consideration in certain subgroups.

References:

1. Tuculina MJ, et al. Rom J Oral Rehab 2022;14:78
2. Osman A, et al. Metabolites 2023;13:1192
3. Popescu AD, et al. Diagnostics 2022;12:2669
4. Bechir ES, et al. Revista de Chimie 2018;69:3565
5. Trandafir AI, et al. J Clin Med 2023;12:7399

P277
OSTEOPENIA IN AN ELDERLY FEMALE WITH IRRITABLE BOWEL SYNDROME UNDER SULFASALAZINE TREATMENT

A.-M. Gheorghe[1], A.-L. Ioan[2], O.-C. Sima[1], A.-I. Trandafir[1], E. Petrova[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology, [3]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Gastrointestinal diseases including irritable bowel syndrome (IBS) may impair bone metabolism due to chronic inflammation, malabsorption, and calcium and vitamin D deficiencies. However, sulfasalazine has been showed to increase bone formation. [1–5] We aim to introduce a case of osteopenia in a patient with IBS in treatment with sulfasalazine, associating autoimmune thyroiditis.

Casereport: An 83-year-old female patient was admitted for skeleton health evaluation. Her personal medical history included: IBS for which she had been treated with sulfasalazine for 5 y, and, also, autoimmune Hashimoto's thyroiditis with adequate levothyroxine substitution. On current admission, the thyroid panel under levothyroxine 75 μg/d revealed a TSH of 0.58 μUI/mL (normal: 0.5–4.5), with freeT4 (thyroxine)of 13.59 pmol/L (normal: 9–19), high thyroid peroxidase antibodies titter > 1000 UI/mL (normal: 0–5.61) and the cervical ultrasound identified multinodular goiter with hypoechoic pattern. The patient had normal serum levels of calcium of 9.7 mg/dL (normal: 8.5–10.2), phosphorus of 4.1 mg/dL (normal: 2.5–4.5) and parathormone of 25.67 pg/mL (normal: 15–65), with mild vitamin D insufficiency (25-hydroxivitamin D of 27.5 ng/mL, normal: 30–100). Bone turnover markers showed increased resorption: CrossLaps of 0.86 ng/mL (normal: 0.33–0.78), with normal formation in terms of serum osteocalcin of 35.9 ng/mL (normal: 15–46). DXA showed osteopenia with higher scores before starting sulfasalazine: lumbar L1–L4 BMD of 0.946 g/cm^2, T-score of − 1.9, Z-score of 0.1, femoral neck BMD of 0.712 g/cm^2, T-score of − 2.3, Z-score of 0.1. No vertebral fracture was detected at screening lumbar-thoracic X-ray. The patient continued with vitamin D 2000 UI/d and periodical checkups.

Conclusion: IBS and consequent malabsorption may be among the factors leading to bone loss; hence, in this case, the status quo of the bone health may be related to the therapy over the latest 5 years with sulfasalazine.

References:

1. Tuculina MJ, et al. Rom J Oral Rehab 2022;14:78
2. Popescu AD, et al. Diagnostics 2022;12:2669
3. Osman A, et al. Metabolites 2023;13:1192
4. Popescu M, et al. Diagnostics 2022;12:960
5. Bechir ES, et al. Revista de Chimie 2018;69:3565

P278
EFFICACY OF ANTIRESORTIVE TREATMENT IN OSTEOPOROTIC OLDER ADULTS: RESULTS OF A NESTED CASE–CONTROL STUDY

B. A. Cedeno-Veloz[1], E. Lopez[2], M. Gutiérrez-Valencia[2], L. Leache-Alegría[2], L. C. Saiz-Fernandez[2], A. M. Rodriguez-Garcia[1], R. Ramirez-Velez[3], M. Izquierdo[3], N. Martinez-Velilla[1]

[1]Geriatric Dept., Hospital Universitario de Navarra (HUN), [2]Unit of Innovation and Organization, Navarre Health Service, [3]Dept. of Health Sciences, Public Univ. of Navarra, Pamplona, Spain

Objective: Osteoporosis, often dubbed a "silent epidemic," poses serious health risks including disability, fractures, and increased mortality, particularly due to hip fractures. Despite extensive research and advancements in bone health assessments and treatments, the predictability of hip fracture risk and the effectiveness of treatments like antiresorptives remain unclear in older adults. These treatments, thought to enhance bone density, have not shown definitive advantages in reducing hip fracture risk in this population. Cohort studies offer insights but leave critical questions about the real-world effectiveness of these treatments in preventing hip fractures, especially in elderly women, unanswered.

Methods: This study, utilizing the Spanish primary care database BIFAP from January 1, 2010, and December 31, 2021; focused on women aged 75 or older with osteoporosis. Participants were followed until hip fracture (potential case), cancer diagnosis (excluding basal cell skin carcinoma), death from any cause, loss of follow-up, or the end of the study period. Exclusions included history of cancer (excluding basal cell skin cancer), Paget's disease, rheumatoid arthritis, polymyalgia rheumatica or ankylosing spondylitis, a history of hip fracture from high-impact trauma, and patients on oral corticosteroid treatment for more than 3 months. Exposure to antiresorptive drugs was the main focus, with users categorized based on timing since last prescription. Up to 10 controls was selected per case. Additional variables like prior fractures and medication history were considered. Statistical methods included logistic regression to compare fracture risks among different user groups, with adjustments for potential confounders and subgroup analyses based on fracture history and age.

Results: We compared cases (n = 2057) and controls (n = 19,257). The analysis was stratified into different user categories: Current Users (CU; patients exposed to antiresorptive on the index date or when $\leq$ 1 y has elapsed since the last prescription until the index date), Past Users (PU; when more than 3 y have elapsed since the last prescription until the index date), Recent Users (RU; when between 1 and 3 y have elapsed since the last prescription until the index date), and Never Users (NU; no time before the index date had received treatment with antiresorptive drugs) (Table 1).

Table 1. Association between exposure to antiresorptive and the risk of hip fracture

	Cases (n=2057), n (%)	Controls (n=19257), n (%)	OR (95%CI)	Adjusted OR (95%CI)
CU vs. PU+RU+NU				
Current users	301 (6.9%)	4039 (93.1%)	ref	ref
past users + recent user + never users	1756 (10.3%)	15236 (89.7%)	1.27 (1.11, 1.46)	1.35 (1.17, 1.55)
CU+RU+PU vs. NU				
Never users	1390 (9.2%)	13761 (90.8%)	ref	ref
Current user + recent user + past user	667 (10.8%)	5514 (89.2%)	1.14 (1.02, 1.27)	1.01 (0.90, 1.13)
CU vs. Others				
Current user	301 (6.9%)	4039 (93.1%)	ref	ref
Recent users	150 (14.9%)	857 (85.1%)	1.17 (1.01, 1.33)	1.33 (1.15, 1.53)
Past users	216 (25.9%)	618 (74.1%)	1.51 (1.21, 1.89)	1.48 (1.18, 1.86)
Never users	1390 (9.2%)	13761 (90.8%)	2.40 (1.93, 2.98)	2.54 (2.03, 3.16)
According to the moment of exposure to antiresorptive				
Never user	1390 (9.2%)	13761 (90.8%)	ref	ref
Current user	301 (6.9%)	4039 (93.1%)	0.86 (0.75, 0.99)	0.76 (0.65, 0.87)
Recent users	150 (14.9%)	857 (85.1%)	1.30 (1.07, 1.57)	1.12 (0.91, 1.37)
Past users	216 (25.9%)	618 (74.1%)	2.06 (1.70, 2.48)	1.91 (1.57, 2.33)
According interval between OP diagnosis and hip fracture				
<2 y n=11397				
Current users	66 (2.5%)	2594 (97.5%)	ref	ref
PU+RU+NU	328 (3.8%)	8409 (96.2%)	1.44 (1.07, 1.93)	1.48 (1.10, 2.00)
2-5 y n=7076				
Current users	126 (9.8%)	1154 (90.2%)	ref	ref
PU+RU+NU	713 (12.3%)	5083 (87.7%)	1.22 (0.98, 1.52)	1.34 (1.06, 1.69)
>5 y n=2859				
Current users	109 (27.3%)	291 (72.8%)	ref	ref
PU+RU+NU	715 (29.1%)	1744 (70.9%)	1.14 (0.86, 1.50)	1.13 (0.84, 1.51)

Abbreviations: CU: current user, NU: never user, PU: past user, RU: recent user

1. CU vs. PU + RU + NU: Current users showed a lower percentage of hip fractures compared to the combined group of past, recent, and never users. The adjusted odds ratio (OR) indicated a statistically significant increased risk in the PU + RU + NU group with OR 1.35 (1.17, 1.55).
2. CU + RU + PU vs. NU: When combining current, recent, and past users against never users, the latter group had a higher percentage of hip fractures. However, the adjusted OR suggested no significant difference in risk with OR 1.01 (0.90, 1.13).
3. CU vs. Others (RU, PU, NU): Current users had the lowest percentage of hip fractures among all groups. The adjusted ORs for recent, past, and never users progressively increased, indicating a higher risk compared to current users.
4. Analysis by exposure time: We also analyzed data based on the interval between osteoporosis diagnosis and hip fracture. The results varied with the time intervals (< 2 years, 2–5 y, > 5 y), showing different risk patterns among current users and the combined group of past, recent, and never users.

Conclusion: Current use of antiresorptive medications is associated with a reduced risk of hip fracture compared to past, recent, or never use. The risk varies with the duration since osteoporosis diagnosis, highlighting the importance of ongoing medication adherence for fracture prevention.

P279
EVALUATION OF PRECISION MEDICINE WITH BIOMARKERS IN FRACTURE RISK PREDICTION: PROTOCOL OF A COHORT STUDY

B. A. Cedeno-Veloz[1], A. M. Rodriguez-Garcia[1], S. Domínguez-Mendoza[1], M. Fernández-González[2], G. Gutierrez-García[3], J. Preciado-Goldaracena[4], F. Zambom-Ferrasi[2], N. Martinez-Velilla[1]

[1]Geriatric Dept., Hospital Universitario de Navarra (HUN), [2]Navarrabiomed, IdiSNA, Navarra Institute for Health Research, Pamplona, Navarra, [3]Navarrabiomed Biobank, Pamplona, Navarra, [4]Dept. of Pharmacology, Hospital Universitario de Navarra (HUN), Pamplona, Spain

Objective: Osteoporosis, a systemic skeletal condition characterized by reduced bone density and quality, leads to increased fragility and fracture risk. Current clinical guidelines focus on high fracture risk detection but face limitations in older adults. This study aims to bridge knowledge gaps by evaluating blood biomarkers related to osteoporosis' molecular mechanisms, proposing a patient-specific risk stratification tool for more precise treatment approaches, emphasizing the need for new biological markers in clinical contexts.

Methods: The study is designed as an observational cohort, focusing on patients referred to the geriatric unit at the University Hospital of Navarra. Recruitment spans 2024–2025, with follow-up of two years. It includes women over 75 y at high risk of fracture (defined as a patient with osteoporosis and fragility fracture in the 2 y prior to assessment), with specific exclusion criteria (impossibility to walk, life expectancy < 2 y and no terminal illness). The methodology includes initial clinical evaluations, blood sample (serum will be collected and 46 biomarkers were analysed in serum analysis on the Olink platform analyses), ultrasound bone densitometry and body composition with bioimpedanciometry. Periodic for follow-ups include both telephonic and in-person (Fig. 1). Main outcome will be frailty fracture incidences. Secondary outcomes such as time to first fracture, with a particular interest in hip and vertebral fractures. Prognostic variables include changes in FRAX scores, BMD, and factors related to frailty and sarcopenia will be also evaluated. Biomarkers are a central study variable, analyzed for changes over the study period. Covariates include demographic, lifestyle, anthropometric, geriatric, nutritional, functional, and biochemical variables. Statistical methods involve descriptive comparisons, multivariate logistic regression, and principal component analysis. Quality control measures are in place for data integrity, and ethical considerations align with current regulations.

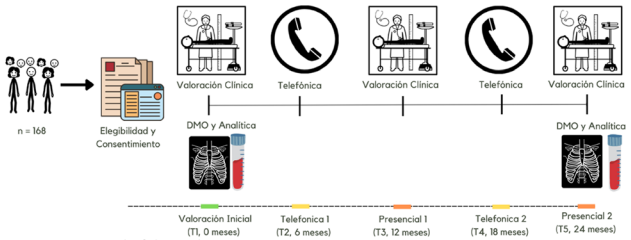


Figure 1. Protocol of the study

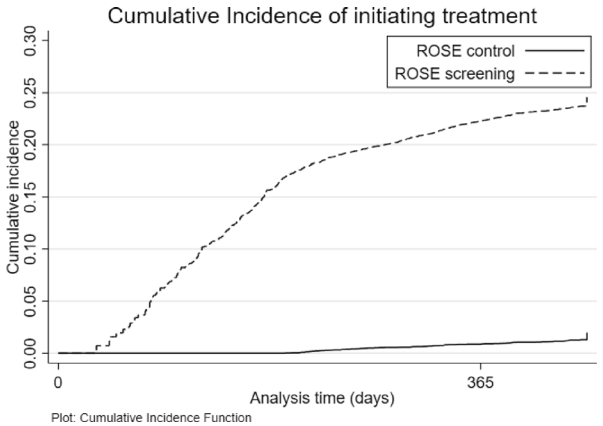
Results: Historically, predicting the risk of osteoporosis-related fractures has been suboptimal. It's crucial to develop new strategies for understanding, predicting, and addressing osteoporosis from the perspective of precision medicine, as traditional treatment approaches for high-risk patients are inadequate for tackling systemic deterioration in bone microstructure. The European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (ESCEO) has proposed relevant biomarkers for musculoskeletal health research. Analytical technologies are increasingly detailing molecular and cellular alterations in osteoporosis and patient variability. Our group has preliminary results on distinct biomarkers in fractured and non-fractured patients, linked to fracture risk via the FRAX scale, moving beyond just associating biomarkers with osteoporosis to fracture risk. However, these findings are from small, cross-sectional studies or male-only studies, needing validation in longitudinal studies with more female representation, the most affected group. While the identification of proteins and metabolic pathways involved in bone metabolism regulation across populations has improved, the precise understanding of biological mechanisms underlying low BMD remains incomplete.
Conclusion: The purpose of our update study will be to determine the real-life evidence of precision medicine with biomarkers in fracture risk prediction.

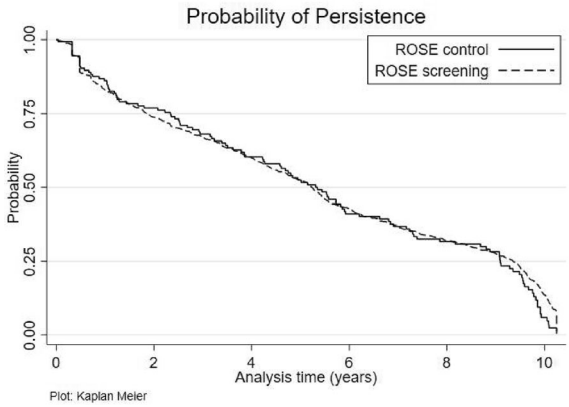
P280
ASSESSMENT OF ADHERENCE TO ANTI-OSTEOPOROTIC MEDICATION (AOM) TREATMENT IN THE RISK-STRATIFIED OSTEOPOROSIS STRATEGY EVALUATION (ROSE) SCREENING PROGRAMME: A 10-YEAR FOLLOW-UP STUDY

T. G. Petersen[1], K. H. Rubin[1], M. K. Javaid[2], A. P. Hermann[3], K. Åkesson[4], B. Abrahamsen[5]

[1]Research Unit OPEN, Dept. of Clinical Research, Univ. of Southern, Odense, Denmark, [2]NDORMS, Univ. of Oxford, Oxford, UK, [3]Research unit of Endocrinology, Odense Univ. Hospital, Odense, Denmark, [4]Clinical and Molecular Osteoporosis Research Unit, Dept. of Clinical Sciences Malmö, Malmö, Sweden, [5]Dept of Medicine, Holbæk Hospital and OPEN, SDU, Denmark

Objective: The ROSE screening programme RCT (Rubin, Osteoporos Int 2018;29:567) offers a comprehensive approach to risk assessment and initiation of anti-Osteoporotic medication (AOM). However, a screening programme's feasibility depends on adherence to treatment and this could be poorer in those screened as opposed to women actively seeking assessment and treatment. We aimed to investigate the impact of the ROSE screening programme on long-term adherence to AOM treatment.
Methods: Women aged 65–80, residing in the Region of Southern Denmark 2010–2011, were randomized into a screening or a control group. Based on questionnaire data, women in the screening group with a 10-year fracture risk (FRAX^{TM}) of $\geq$ 15% were invited for DXA scanning, following standard AOM treatment in case osteoporosis was identified. We assessed initiation, medication possession ratio (MPR), and persistence to AOM treatment using information on filled prescriptions and in-hospital treatment assi from Danish nationwide registers. Survival analyses, with a maximum follow-up of 10 y, were applied to evaluate differences between the groups.
Results: Among the 15,505 women eligible for the analyses, 971 (6.26%) initiated AOM within one year after the intervention. Significantly more participants in the screening group started on AOM (HR 5.14 (95% CI 4.29; 6.16)) compared to controls (Fig. 1). Persistence was good with 50% remaining on treatment for 5 y or longer and 75% for 2 y or more, with equally good persistence in the screening group (Fig. 2).





Conclusion: Nonadherence presents a significant challenge in osteoporosis. The study demonstrates that the ROSE programme increases initiation of AOM treatment and that screened subjects exhibit similar levels of adherence once they have initiated medication compared to those not screened.
Disclosures: Grant/research support: UCB (MKJ, BA), Kyowa-Kirin (BA). Consultant/advisory activities: UCB (MKJ,APH,BA), Amgen (MKJ,APH,BA), Gedeon Richter (APH,BA), Abbvie (MKJ), Besin Healthcare (MKJ), Sanofi (MKJ), Kyowa-Kirin (BA), Pharmacosmos (BA).

P281
RISK FACTORS OF URATE DEPOSITS IN WOMEN WITH ASYMPTOMATIC HYPERURICEMIA

B. B. Bengana[1], G. H. Guerboukha[1], B. A. Boukabous[1], L. S. Lefkir[1]

[1]Univ. Hospital of Benimessous, Rheumatology Dept., Algiers, Algeria

Objective: This study marks a milestone by focusing on gout, a disease often studied in men but neglected in women. It explores the prevalence of urate deposits detected by ultrasound exclusively in women with asymptomatic hyperuricemia (AH). The aim is also to evaluate risk factors associated with these deposits, such as the double contour (DC) sign and tophus but within an exclusively female population.
Methods: For this analysis, musculoskeletal ultrasounds were performed on female participants, divided into two groups: with and without AH. The knee, ankle, and first metatarsophalangeal (MTP1) joint, as well as certain tendons, were examined. Demographic, clinical, and biological data from both groups were compiled to study risk factors associated with urate deposits detected by ultrasound, focusing particularly on the double contour sign and tophus.
Results: The results involved 93 women (48 with AH and 45 without AH). The double contour sign was more common in the knee and ankle joints in those with AH (knees: 7/48 vs. 1/45; ankles: 5/48 vs. 0/45). The most common ultrasound manifestations at the MTP1 joints were tophus and the double contour sign (tophus: 3/48 vs. 0/45; DC: 8/48 vs. 2/45). Risk factors identified for the double contour sign were advanced age and renal function issues (OR, 2.67, $p = 0.01$; OR, 1.71, $p = 0.022$ respectively). As for tophus, it was associated with high uricemia levels (OR, 2.32, $p = 0.023$).
Conclusion: This study reveals that one in six women with AH had ultrasound signs of urate deposits. Advanced age and renal issues were associated with the double contour sign, while tophus was linked to high uricemia levels.

P282
PAINFUL SWELLING OF THE FINGERS REVEALING POLYOSTOTIC MELORHEOSTOSIS

B. B. Bengana[1], B. I. Boukrara[1], G. H. Guerboukha[1], L. S. Lefkir[1]

[1]Univ. Hospital of Benimessous, Rheumatology Dept., Algiers, Algeria

Melorheostosis is a rare sclerosing bone dysplasia, with approximately 400 known cases worldwide. Often monomelic, its etiopathogenesis remains poorly understood. This process typically begins in childhood or adolescence, manifesting as irregular cortical hyperostosis, characterized by a candle wax-like appearance on imaging, mainly affecting the lower limb.
Casereport: We present the case of a 31-year-old patient, S.L, with a history of type 2 diabetes and thyroidectomy under levothyroxine. Since the age of 17, she has had unilateral hypertrophy of the left upper limb affecting the 4th finger and forearm. Over the past 6 months, she has developed hyperesthesia throughout the left forearm and intermittent mechanical pain in the 4th finger, improved by NSAIDs. Clinical examination revealed no limitation of the left shoulder, elbow, or wrist joints. Laboratory results for phospho-calcium, renal, and inflammatory parameters were normal. X-rays and CT scans showed linear candle wax-like hypercondensation along the humeral and radial diaphyses, carpal bones, metacarpal bones, and phalanges. Scintigraphy revealed intense tracer uptake in the 3rd and 4th rays of the hand, as well as in the bones of the left forearm and humerus.
Discussion: Melorheostosis is a congenital disease with insidious onset, observed in our patient during adolescence and affecting multiple bones of the upper limb. Radiologically, the characteristic appearance of melorheostosis presents as linear candle wax-like hypercondensation along the bones. Bone scintigraphy shows moderate uptake in the areas of condensation, allowing assessment of disease extent. Its progression can lead to refractory pain, deformities, and joint stiffness. Treatments remain largely nonstandardized, primarily focused on symptomatic relief with analgesics, NSAIDs, bisphosphonates, and colchicine.
Conclusion: Polyostotic melorheostosis remains exceptional. The diagnosis relies on the candle wax appearance of the long bone cortices. Its management remains complex due to the absence of specific treatment.

P283
AN ENIGMATIC CASE OF GORHAM-STOUT DISEASE WITH RECURRENT PLEURISIES

B. B. Bengana[1], T. H. Touaher[1], L. S. Lefkir[1]

[1]Univ. Hospital of Benimessous, Rheumatology Dept., Algiers, Algeria

Gorham-Stout disease is a spontaneous and massive osteolysis resulting from local proliferation of small blood or lymphatic vessels, leading to progressive destruction and resorption of bone tissue. It is a rare and sporadic disease, with approximately 350 identified cases worldwide. We report a case of Gorham-Stout disease in a young man revealed by suspicious osteolysis of the shoulder.
Casereport: Mr. S.F., 34 years old, was hospitalized for management of diffuse lytic osteopathy. Beginning in 2010, he experienced lingering moderate pain in the right arm, with recurrent pleurisies requiring periodic punctures, indicating chylothorax. MRI revealed a fluid lesion in the humerus, radius, and ulna. In 2023, following ischemia of the right upper limb, amputation was performed, with histopathological examination concluding hemangioendothelioma, ruling out other malignant pathologies. Clinical examination noted fair general condition with diffuse pain predominating in the lower limbs and anterior thoracic region. Laboratory findings showed inflammatory syndrome, anemia at 8.3 g/dL; renal, hepatic, and phosphocalcic tests were normal. Chest X-ray showed bilateral moderate pleural effusion. Whole-body CT: generalized lytic osteopathy affecting the entire skeleton (ribs, lower angles of scapulae, iliac wings, vertebral bodies). Bone scintigraphy: increased uptake in the sternum, tip of the left scapula, right costal arch, and pelvis. Subsequently managed in pneumology with pleural punctures and oxygen therapy. Prescribed bisphosphonate therapy.
Discussion: Therapeutic management is complex due to the lack of curative treatment. Our patient had Gorham-Stout disease affecting all bones of the body, with recurrent chylothorax requiring frequent punctures, associated with pulmonary acidosis requiring oxygen therapy limiting surgical intervention. Unfortunately, the patient died due to respiratory decompensation.
Conclusion: Gorham-Stout disease, rare and causing significant disability, can compromise life prognosis mainly through pulmonary complications. Diagnosis and management remain complex and poorly understood.

P284
SAFETY OF GAM-COVID-VAC (SPUTNIK V) COMBINED VECTOR VACCINE IN PATIENTS WITH IMMUNOINFLAMMATORY RHEUMATIC DISEASES

A. Kulikov[1], N. Muravyeva[1], B. Belov[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Patients with immunoinflammatory rheumatic diseases (IRD) are at high risk of developing COVID-19. Vaccination should be an effective method of preventing this disease. However, vaccination may be unsafe in IRD patients.
Methods: The study included 222 patients with IRD (171 women, 51 men, age 49 ± 15,5 y, duration of disease 10.6 ± 9.2 y)—the main group and 111 people without any IRD (84 women, 27 men, age 37,2 ± 15,7 y)—the control group. 145 patients received disease-modifying antirheumatic drugs (mainly methotrexate—69), 81 were treated with biologics (mostly with rituximab—58). 64 took glucocorticoids, 10 did not receive therapy. All participants were vaccinated with both components of Gam-COVID-Vac and interviewed by a research doctor with a unified questionnaire.
Results: After the introduction of the first dose pain at the injection site without limitation of limb movements (22.5 and 34.2%, $p = 0.023$), weakness (28.4 and 43.2%, $p = 0.007$), fever (24.8 and 51.4%, $p < 0.001$), arthralgia or myalgia (10.8 and 31.5%, $p < 0.001$), headache (7.7 and 15.3%, $p = 0.03$) and chills (4.1 and 27.9%, $p < 0.001$) were significantly less common in the main group. After the administration of the second dose pain at the injection site without limitation of limb movements (14.4 and 26.1%, $p = 0.01$) and arthralgia or myalgia (10.4 and 18.9%, $p = 0.03$) were also less common in the main group, but no significant differences were obtained for other adverse events (AEs). A significant difference was revealed between two groups in the number of patients with local and systemic AEs after the introduction of the first (22.1% and 44.1%, respectively; $p < 0.001$), second (14% and 29.7%, $p = 0.007$) components and both doses (35.6 and 21.6%, respectively; $p = 0.01$). There were no exacerbations of IRD and the occurrence of autoimmune phenomena after complete immunization.
Conclusion: According to our data, the Safety of Gam-COVID-Vac in patients with IRD is satisfactory.

P285
SAFETY OF GAM-COVID-VAC (SPUTNIK V) COMBINED VECTOR VACCINE IN PATIENTS WITH RHEUMATOID ARTHRITIS

A. Kulikov[1], N. Muravyeva[1], B. Belov[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Patients with rheumatoid arthritis (RA) are at high risk of developing COVID-19. Vaccination should be an effective method of preventing this disease. However, vaccination may be unsafe in RA patients.
Methods: The study included 119 RA patients (109 women, 10 men, age 52.9 ± 14.7 y, duration of disease 11.3 ± 8,8 y)—the main group and 111 people without any immunoinflammatory rheumatic diseases (84 women, 27 men, age 37.2 ± 15.7 y)—the control group. 90 patients received disease-modifying antirheumatic drugs (mostly methotrexate—54), 58—biological drugs (mainly rituximab—48). All participants received two doses of Gam-COVID-Vac and were interviewed by a research doctor with a unified questionnaire.
Results: Local and systemic adverse events (AEs) were observed both in the main group and in the control group. There were no significant differences between two groups in the frequency of local reactions after both components. There was a significant difference between two groups in the frequency of weakness (26.1 and 43.2%, $p = 0.007$), fever (18.5% and 51.4%, $p < 0.001$), arthralgia or myalgia (7.6 and 31.5%, $p < 0.001$), chills (5 and 27.9%, $p < 0.001$) and headache (4.2% and 15.3%, $p = 0.005$) after administration of the first (but not the second) component of the vaccine. A significant difference was revealed between the main group and the control group in the number of patients with local and systemic AEs both after the introduction of the first component of the vaccine (21.8 and 44.1%, $p < 0.001$) and after the second (14.3% and 29.7%, $p = 0.005$). After administration of the two components of the vaccine, a higher number of patients without any AEs were detected in the main group compared to the control group (34.5 and 21.6%, $p = 0.03$). Exacerbation of RA in main group are not marked.
Conclusion: According to our data, the safety of Gam-COVID-Vac in RA patients is satisfactory.

P286
SAFETY OF GAM-COVID-VAC (SPUTNIK V) COMBINED VECTOR VACCINE IN PATIENTS WITH SPONDYLOARTHRITIS

A. Kulikov[1], N. Muravyeva[1], B. Belov[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Vaccination remains one of the most effective methods of preventing infectious diseases, but it can be unsafe in patients with spondyloarthritis (SpA) who probably have a high incidence of COVID-19.
Methods: The study included 62 SpA patients (36—ankylosing spondylitis, 16—psoriatic arthritis, 10—undifferentiated SpA, 27 women, 35 men, age 39.5 ± 11.6 y, duration of the disease 11.2 ± 8.3 y)—the main group and 111 people without any immunoinflammatory rheumatic diseases (84 women, 27 men, age 37.2 ± 15.7 y)—the control group. 30 patients received disease-modifying antirheumatic drugs (17—methotrexate), 12—biological drugs (8—TNFα inhibitors), 17—only nonsteroidal anti-inflammatory drugs. All participants were vaccinated with two doses of Gam-COVID-Vac and interviewed by a research doctor with a unified questionnaire.
Results: Local and systemic adverse events (AEs) occurred in both groups. After the introduction of the first (9.7 and 34.2%; $p < 0.001$) and second (6.5% and 26.1%; $p < 0.001$) components of the vaccine there was a significant increase in the frequency of pain without restriction of movement in the control group. There was a significant difference between two groups in the frequency of fever (35.5% and 51.4%, $p = 0.045$), arthralgia or myalgia (12.9 and 31.5%, $p = 0.007$) and chills (1.6 and 27.9%, $p < 0.001$) after administration of the first (but not the second) component of the vaccine. Also, significant difference was noted between two groups in the number of patients with local and systemic AEs after the introduction of the first component of the vaccine (16.1 and 44.1%, $p < 0.001$) and after the second (11.3% and 29.7%, $p = 0.006$). After complete immunization, the percentage of patients without any AEs was significantly higher in the main group—40.3% and 21.6%, $p = 0.009$. There was no exacerbation of SpA.
Conclusion: According to our data, the safety of Gam-COVID-Vac in patients with SpA is satisfactory.

P287

INFLUENCE OF LOW MUSCLE MASS ON PHYSICAL PERFORMANCE TESTS IN FRAIL OLDER WOMEN

B. C. C. Lenardt[1], A. Maoski[1], G. Furlan[1], I. C. De Lima[1], M. C. Souza[1], L. Amaral[1], T. Yamaguishi[1], O. De Matos[1]

[1]Federal Univ. of Technology Parana, Curitiba, Brazil

Objective: To evaluate the correlation between low muscle quantity and physical performance in frail older women.
Methods: the sample consisted of 53 women aged 60 or over, classified as normal (N = 23) and pre-frail and frail (N = 30) by the functional clinical vulnerability index (IVCF-20). DXA was used for total mass, total lean mass, appendicular lean mass adjusted for BMI (ASM/BMI) and adjusted for height squared (ASM/H^2), BMD and T-score value. The physical performance tests were handgrip strength (HGS), single-leg stance (SLS) and Short Physical Performance Battery (SPPB). For statistics, descriptive analysis, nonparametric Mann–Whitney U, Spearman correlation and linear regression analysis were used.
Results: When comparing the results of the physical tests between the groups, the frail group presented the lowest results, with a moderate and significant correlation between IVCF and ASM/BMI. While for the normal group, lean mass showed a correlation between ASM/H^2 and an inverse and moderate correlation with the single-leg stance.

Table 1. Correlation test for both groups

Normal group (n=23)			
		r_s	(p)
Lean mass	Total mass	0.686	0.000**
Lean mass	HGS	0.416	0.048*
Lean mass	ASM/H^2	0.603	0.002**
HGS	Age	-0.422	0.045*
IVCF	SLS	-0.493	0.017*
ASM/H^2	Total mass	0.500	0.015*
ASM/BMI	Neck T-score	-0.526	0.010**
ASM/BMI	Lumbar BMD	-0.416	0.049*
Frail group (n=30)			
Total mass	HGS	0.439	0.015*
Total mass	BMI	0.502	0.005**
Total mass	ASM/H^2	0.615	0.000**
IVCF	ASM/BMI	0.376	0.041*
SPPB	Age	-0.594	0.001**
ASM/H^2	Age	-0.444	0.014*

The main influence between the variables was 14.7% of IVCF on ASM/BMI and 14.1% on lean mass for the frail group. For the same group, SPPB presented moderate and inverse correlation with age. HGS showed a greater correlation with muscle mass for both groups.
Conclusion: We conclude that it is very important to use the classification to verify cognitive and functional conditions in older people. The physical tests used are important to analyze the risk of falls, but for this study HGS was the test that had the greatest statistical relationship with lean mass.

P288

ASSOCIATION BETWEEN FALL RISK TOOLS WITH TRABECULAR BONE SCORE (TBS) AND FRACTURE RISK ASSESSMENT TOOL (FRAX) IN OLDER WOMEN WITH LOW BONE MINERAL DENSITY

B. C. C. Lenardt[1], A. Maoski[1], O. De Matos[1]

[1]Federal Univ. of Technology Parana, Curitiba, Brazil

Objective: verify the relationship between fall risk instruments with TBS and FRAX in women with low BMD.
Methods: The sample consisted of 24 women aged 60 or over, classified according to BMD analysis as normal (N = 06) and low BMD (N = 18). The following were used: fracture risk assessment instrument (FRAX), TBS by DXA. The physical performance tests carried out were the Short Physical Performance Battery (SPPB) and the Functional Reach Test (FRT). For statistics, Shapiro–Wilk analysis was used to verify the sample distribution, t-test to compare variables between groups, Pearson correlation and linear regression analysis.
Results: When comparing groups, the variables did not show a statistically significant difference. Therefore, to verify the association between the variables, only the low BMD group (n = 18) was used.

Table 1. Correlation between TBS and physical performance tests (n=18).

Variables		r	P	Regression analysis%)
TBS absolute	SPPB	-0,560	0,016*	31,4
TBS absolute	FRT	-0,674	0,002**	45,4
TBS Spine	SPPB	-0,526	0,025*	27,6
TBS Spine	FRT	-0,758	0,000**	57,5
TBS Hip	FRT	-0,614	0,007**	37,7

Table 2. Correlation between TBS and FRAX (n=18).

Variables		r	P	Regression analysis (%)
TBS Spine	FRAX Hip	-0,580	0,012*	33,6
TBS Neck	FRAX Hip	-0,770	0,000**	59,3
TBS Neck	FRAX Major	-0,556	0,017*	30,9
TBS Hip	FRAX Hip	-0,731	0,001**	53,4
TBS Hip	FRAX Major	-0,535	0,022*	28,6

BMD did not show a significant correlation with any other performance variable, TBS or FRAX. Regarding bone analysis, TBS demonstrated an important correlation and influence on performance tests and on all FRAX sites. TBS Spine correlated with total hip FRAX. TBS Spine had moderate and inverse association with FRAX hip, while TBS Neck had an association with FRAX total Hip and FRAX major.
Conclusion: For this study, TBS was important not only because of its relationship with FRAX, but also because it is related to fall risk tests. Therefore, we conclude that the association of fall risk assessment tools with TBS and FRAX can more efficiently predict the risk of falls and fractures for this population.

P289
RISK FACTORS INFLUENCING PERIPROSTHETIC FRACTURE AND MORTALITY IN ELDERLY PATIENTS FOLLOWING HEMIARTHROPLASTY WITH A CEMENTED COLLARLESS POLISHED TAPER STEM FOR AN INTRACAPSULAR HIP FRACTURE

B. C. Chen[1], C. S. Scott[2], N. C. Clement[2]

[1]Second Affiliated Hospital of Soochow Univ., Suzhou, China, [2]Royal Infirmary of Edinburgh, Edinburgh, UK

Objective: To evaluate the incidence of reoperation (all cause and specifically for periprosthetic fracture [PFF]) and mortality, and associated risk factors associated with these following a hemiarthroplasty incorporating a cemented collarless polished taper slip stem (PTS) for management of an intracapsular hip fracture.
Methods: This retrospective study included hip fracture patients aged 50 years and older treated with Exeter (PTS) bipolar hemiarthroplasty between 2019–2022. Patient demographics, place of domicile, fracture type, delirium status, ASA grade, length of stay and mortality were collected. Reoperation and mortality were recorded up to a median follow up of 29.5 months. Cox regression was performed to evaluate independent risk factors for reoperation and mortality.
Results: The cohort consisted of 1619 patients with a mean age of 82.2 y (SD 8.8, range 50–104) and 1100 (67.9%) were females. In total 29 (1.8%) patients underwent a reoperation. Twelve (0.7%) patients sustained a PFF during the observation period (United Classification System [UCS]-A n = 2; UCS-B n = 5; UCS-C n = 5), of whom 10 underwent surgical management. Perioperative delirium was independently associated with the occurrence of PFF (Hazard ratio (HR) 5.92, p = 0.013) and surgery for UCS-B PFF (HR 21.7, p = 0.022). Neither, all-cause reoperation nor PFF related surgery were independently associated with mortality (HR 0.66, p = 0.217 and HR 0.38, p = 0.170, respectively). Perioperative delirium, male sex, older age, high ASA grade and pre-fracture residential status were independently associated with mortality following hemiarthroplasty ($p < 0.001$).
Conclusion: The cumulative incidence of PFF at 4-years was 1.1% in elderly patients following cemented taper slip hemiarthroplasty for a hip fracture. Perioperative delirium was independently associated with a PFF, and more specifically with UCS B and C PFF. However, reoperation for PPF was not independently associated with patient mortality after adjusting for patient specific factors.

P290
LATERAL WALL THICKNESS (< 20.5 MM) IS NOT ASSOCIATED WITH REVISION RISK OF MEDIALLY STABLE INTERTROCHANTERIC FRACTURES FIXED WITH A SLIDING HIP SCREW

B. Chen[1], A. Duckworth[2], L. Farrow[3], N. Clement[2]

[1]Second Affiliated Hospital of Soochow Univ., Suzhou, China, [2]Royal Infirmary of Edinburgh, Edinburgh, UK, [3]Univ. of Aberdeen, Aberdeen, UK

Objective: To determine whether lateral femoral wall thickness (LWT) < 20.5 mm was associated with increased revision risk of intertrochanteric fracture (ITF) following sliding hip screw (SHS) fixation when medial calcar was intact. Additionally, the study assessed the association between LWT and patient mortality.
Methods: This retrospective study included ITF patients aged over 50 years treated with SHS fixation between 2019 and 2021 at a major trauma centre. Demographic information, fracture type, delirium status, ASA grade, length of stay (LoS) were collected. LWT and tip apex distance (TAD) were measured. Revision surgery and mortality were recorded at a mean follow-up of 19.5 months (range 1.6–48 months). Cox regression was performed to evaluate independent risk factors of revision surgery and mortality.
Results: The cohort consisted of 890 patients with a mean age of 82 y (SD 10.2). Mean LWT was 27.0 mm (SD 8.6), and there were 213 (23.9%) patients with LWT < 20.5 mm. Twenty patients (2.2%) underwent a revision surgery following SHS fixation. Adjusting for covariates, LWT < 20.5 mm was not independently associated with an increased revision or mortality risk. However, factors that were significantly more prevalent in LWT < 20.5 mm group (residence in care home (HR = 1.84, $p < 0.001$) or hospital (HR = 1.65, p = 0.005), and delirium (HR = 1.32, p = 0.026)) were independently associated with increased mortality risk. The only independent factor associated with increased risk of revision was older age. (HR = 1.07, p = 0.030).
Conclusion: LWT was not associated with risk of revision surgery in patients with an ITF fixed with SHS when medial calcar was intact, after adjusting for the independent effect of age. Although LWT < 20.5 mm was not an independent risk factor for mortality, patients with LWT < 20.5 mm were more likely to be from care home or hospital and have delirium on admission which were associated with a higher mortality rate.

P291
BLOOD FLOW RESTRICTION WITH DIFFERENT LOAD LEVELS IN PATIENTS WITH KNEE OSTEOARTHRITIS: A RANDOMIZED CLINICAL TRIAL

B. Dias[1], R. A. Jardim[1], E. A. Teixeira[1], K. Rodrigues[1], A. Matos[1], N. Iosimuta[1]

[1]Federal Univ. of Amapa, Macapa, Brazil

Objective: To evaluate whether blood flow restriction with low load (BFR + LL) and no load (BFR + rest) are noninferior to high-intensity resistance exercise (HIRE + BFR placebo) for improving muscle strength and reducing pain in patients with knee osteoarthritis (OA) over a 3-week period.
Methods: This clinical trial is a non-inferiority, three-arm, randomized, controlled study conducted with 24 patients of both sexes with knee OA, aged 50 years or older. Participants were randomly allocated to three exercise groups (BFR + LL, n = 8; BFR + rest, n = 8, and HIRE + BFR placebo, n = 8). The treatment protocol spanned 3 weeks with interventions occurring twice a week, each session lasting 40 min, totalizing six sessions. Each session began with 5-min warmup on a bicycle, followed by strengthening exercises performed through knee extension (3 sets of 8 repetitions). The BFR + LL group used lower load (30%RM) than the HIRE + BFR placebo group (80%RM), while BFR + rest group do not perform strengthening exercises. Participants were assessed before and after treatment using the visual analogue scale (VAS) for pain and strength of the right quadriceps muscle was estimated using the 7–10 repetition maximum (7–10RM) test on the chair extensor. Repeated measures ANOVA was applied for statistical analysis (level of significance set at $p \leq 0.05$), using SPSS software.
Results: The average age of the sample was 56.8 (± 8.85) y, with 66.7% of sample being female. All groups increased muscle strength after 3 weeks of intervention (p = 0.046), with higher gain in muscle strength in the BFR + LL group compared to the BFR + rest group (p = 0.024). No statistically significant differences were observed between treatments in reducing pain ($p > 0.05$).
Conclusion: The results of this study demonstrated that a BFR combined with low-intensity resistance exercise lead to similar effects to conventional high-intensity strength training on muscle strength in patients with knee OA in short term. Thus, the BRF associated with low load could be an alternative to traditional treatment for knee OA, being more comfortable modality and potentially increasing patient treatment adhesion.

P292
DENOSUMAB-RELATED OSTEONECROSIS OF THE JAW IN A PATIENT WITH OSTEOPOROSIS AND RHEUMATOID ARTHRITIS: TREATMENT CHALLENGE OF A RARE COMPLICATION

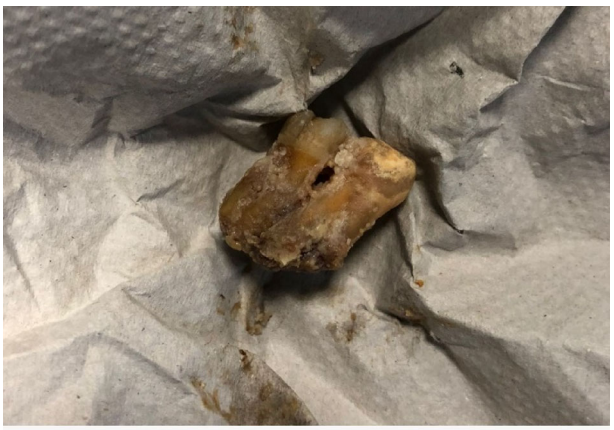
B. Fernandes Esteves[1], R. M. Ferreira[1], M. Bernardes[1], P. Santos[2], L. Costa[1]

[1]Rheumatology Dept., [2]Stomatology Dept., Centro Hospitalar Universitário São João, Porto, Portugal

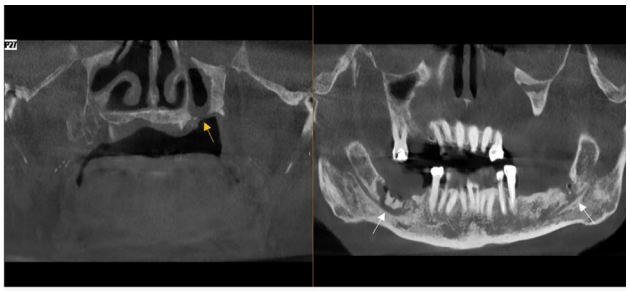
Osteonecrosis of the Jaw (ONJ) is a rare and severe complication of anti-resorptive agents. Treatment of Denosumab-Related Osteonecrosis of the Jaw (DRONJ) in patients with Osteoporosis (OP) remains challenging. The following case aims to highlight the lack of common agreement for anti-osteoporotic treatment in patients with DRONJ.

We describe a case of an 83-year-old woman, with a 16-y history of rheumatoid arthritis, with pulmonary involvement, under rituximab and 5 mg/d of prednisolone, and fractured OP (rib fracture). For OP treatment, she received ibandronic acid from 2007–2012, with a good densitometric response. In 2021, due to a high fracture risk, frequent falls and an eGFR of 30 ml/min/1.73m^2, denosumab 60 mg every 6 months was initiated. The patient received 3 doses, the last one being in December 2022. One month later, she went to the emergency department (ED) with left sided odontalgia for 2 weeks. In the ED, spontaneous detachment of approximately 3 cm of maxillary bone from the left upper arcade was observed, with bone exposure at the level of the 2nd quadrant. She had areas of bone exposure in the 2nd, 3rd, and 4th quadrants. Cone-beam computed tomography confirmed DRONJ stage 3 changes. Denosumab was suspended, a course of antibiotics was started and oral hygiene measures were reinforced. She refused surgery.

The treatment of ONJ can be conservative or surgical. Teriparatide has shown benefits in the treatment of medication-related ONJ. However, the majority of studies are limited to bisphosphonate-related ONJ. After discontinuation, denosumab has a rebound effect associated with a decrease of BMD, requiring sequential treatment. However, the use of teriparatide after denosumab has demonstrated bone mass loss and increased fracture risk. The major therapeutic obstacle in DRONJ is the subsequent anti-osteoporotic therapy. To the authors' knowledge, there are no studies proposing anti-osteoporotic therapy after DRONJ.



Photograph of the detachment of approximately 3cm of maxillary bone from the upper left arcade.



Patient's CBCT presenting stage 3 ONJ. In the 2nd quadrant (yellow arrow) extension to the maxillary sinus. In the 3rd and 4th quadrants (white arrows) extension to the mandibular canal.

P293
EXPLORING THE LINK BETWEEN MUSCULAR SENESCENCE AND OSTEOPOROSIS

B. Gasperini[1], A. Falvino[1], I. Cariati[2], R. Bonanni[1], V. V. Visconti[1], V. Tancredi[2], A. Botta[1], U. Tarantino[3], S. Grillo[3]

[1]Dept. of Biomedicine and Prevention, [2]Dept. of Systems Medicine, [3]Dept. of Clinical Sciences and Translational Medicine, Univ. of Rome Tor Vergata, Rome, Italy

Objective: Osteoporosis is a condition characterized by low mineral density and deterioration of bone tissue microarchitecture, resulting in increased bone fragility and increased risk of fractures. Cellular senescence and the consequent characteristic senescence-associated secretory phenotype (SASP) are crucial factors contributing to the pathogenesis of the disease [1]. Given the interconnection between bone and muscle tissue, this study aims to investigate the correlation between the expression pattern of genes associated to cellular senescence and SASP phenotype with osteoporosis in muscle tissues from OP patients [2,3].
Methods: 6 osteoporotic (OP) and 6 osteoarthritic patients (OA) were enrolled, who underwent surgery for fragility fracture and coxarthrosis, respectively. Subsequently, muscle tissue biopsies were collected for RNA extraction. The expression of *CDKN1A*, *CDKN2*, *IL-6* and *FAS* genes was assessed by quantitative real time-polymerase chain reaction (qRT-PCR) in muscle tissue from OP and OA individuals.
Results: The mRNA levels of two markers of cellular senescence, *p16* and *p21* were higher in the OP patients compared with the OA individuals ($p = 0.0303$; $p = 0.0043$), thus indicating the premature aging of muscle tissues in OP. We then investigated the expression profile of *IL-6* and *FAS* genes whose encoded proteins have been associated with SASP. Interestingly, we found a significant upregulation of both genes in OP muscle ($p = 0.0260$; $p = 0.0043$), in accordance with the expression of cellular senescence biomarkers.
Conclusion: These preliminary results show a potential link between muscular senescence and osteoporosis. These data provide additional insights into the molecular mechanisms underlying osteoporosis, highlighting the importance of considering cellular senescence and SASP as potential therapeutic targets.
References:

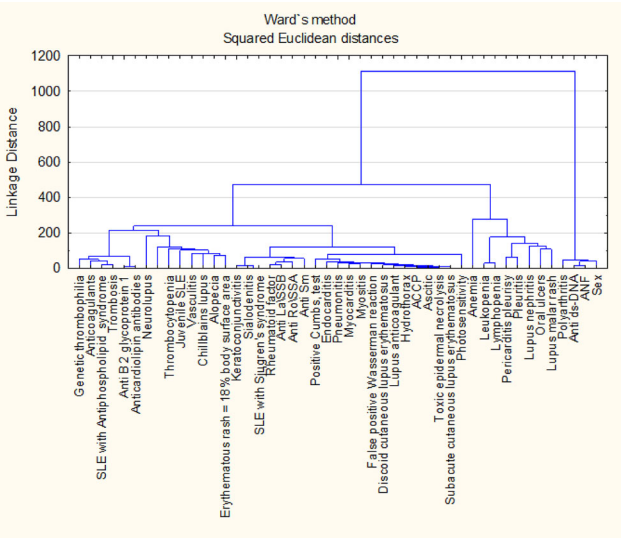
1. Pignolo RJ, et al. JBMR Plus 2021;5:e10488
2. Schafer MJ, et al. JCI Insight 2020;5:e133668
3. Kirk B, et al. Curr Osteoporos Rep 2020;18:388

P294
CLINICAL AND IMMUNOLOGICAL PHENOTYPES OF SYSTEMIC LUPUS ERYTHEMATOSUS IDENTIFIED BASED ON CLUSTER ANALYSIS

B. Issayeva[1], E. Aseeva[2], S. Solovyev[2], S. Glukhova[2], S. Issayeva[1], M. Saparbayeva[1], M. Bizhanova[1], A. Amanzholova[1]

[1]Asfendiyarov Kazakh National Medical Univ., Almaty, Kazakhstan, [2]Rheumatology, Federal State Research Institution (FSRI) named after V.A. Nasonova, Moscow, Russia

Objective: To identify clinical and immunological variants (phenotypes) of systemic lupus erythematosus (SLE) using cluster analysis.
Methods: The study included 400 patients with diagnosis of SLE according to the 2012 SLICC classification criteria. Patients underwent laboratory and immunological workup according to accepted standards of medical care for patients with SLE, and therapy was prescribed in accordance with disease activity (using SLEDAI 2 K).
Results: Among patients, most were females (ratio of men and women—1:10), and people of young age (34.2 ± 11.5 y), with an average duration of illness of 6 [3; 12] y. In 98 (25%) patients with SLE, the disease debuted before the age of 18 y. L nephritis (LN) was detected in 192 (48%) patients, SLE with antiphospholipid syndrome (APS) in 48 (12%), SLE with Sjogren's syndrome in 44 (11%). For cluster analysis 30 clinical, 4 laboratory, 12 immunological and 10 therapeutic parameters were selected and a dendrogram was constructed with the calculation of the Euclidean distance using the Ward method. As a result, five clusters of SLE were identified: with the development of LN; with predominantly extrarenal manifestations; SLE combined with APS; SLE combined with Sjıgren's syndrome; SLE with childhood onset (up to 18 y of age). Clusters differed in clinical, laboratory and immunological parameters, as well as in therapy.



Conclusion: Cluster analysis data made it possible to group the selected signs into five clinical and immunological variants (phenotypes) of SLE. Identification of SLE phenotypes as a set of characteristics that, individually or in combination, make it possible to determine differences between patients based on clinical, laboratory and immunological parameters, variants of the onset and course of the disease, response to therapy and prognosis, will contribute to a personalized approach in choosing the therapy, improving its long-term results, as well as quality of life and prognosis in patients with SLE.

P295
LONG-TERM RESULTS OF THERAPY WITH RITUXIMAB AND BELIMUMAB IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

B. Issayeva[1], A. Mesnyankina[2], E. Aseeva[2], N. Nikishina[2], S. Issayeva[1], M. Saparbayeva[1], M. Bizhanova[1], A. Amanzholova[1]

[1]Asfendiyarov Kazakh National Medical Univ., Almaty, Kazakhstan, [2]Rheumatology, Federal State Research Institution (FSRI) named after V.A. Nasonova, Moscow, Russia

Objective: To evaluate the effectiveness of combination therapy with rituximab (RTM) and belimumab (BLM) in patients with SLE with long-term follow-up.
Methods: 12 patients with SLE (1 M/11F) of high and moderate disease activity, 9 of them with skin-joint manifestations, others had kidney damage, peripheral nervous system, vasculitis. Patients received RTM at a dose of 500–2000 mg with premedication of 6-methylprednisolone, and then BLM was prescribed according to the standard scheme of 10 mg/kg once a month. The patients were divided into two groups depending on the time of evaluation of long-term results. In the first group, data were analyzed 7–9 y after the initiation of RTM (4 people). In the second group of 8 patients after 2–4 y. The efficacy and tolerability of therapy, the activity of SLE, as well as the dose of oral glucocorticoids (GK) were evaluated.
Results: Against the background of combination therapy, a clinical and immunological response was obtained in 11 out of 12 patients one year later (initially, the Me of SLEDAI-2 K was 10 [9.5;14.5] points, 6 and 12 months after the initiation of BLM, Me was 4 [2;6] points, $p < 0.008$). Patients who started receiving RTM + BLM within 0–2 y from the moment of the debut of SLE responded better to therapy, and a more significant improvement in clinical and laboratory parameters was achieved. Subsequently, BLM therapy was limited, on average, to two years with the achievement of stable remission. This therapy allowed the use of medium and low doses of GK as an initiating therapy for exacerbation of SLE, followed by their decrease in dynamics. Clinical remission was achieved and persists in 7 patients, in three exacerbations were observed at different times after the withdrawal of BLM, the effect eluded in one patient, and another had no effect on combination therapy.
Conclusion: The achievement of the most pronounced positive result can be assumed in patients for whom RTM + BLM therapy is initiated as early as possible from the moment of diagnosis (0–2 y). BLM infusions should preferably be carried out according to the recommendations once a month, without long breaks between injections for at least 2 y, and if possible, continue for a long time until a lasting effect is achieved. The use of low doses of GK and their elimination is a very real and achievable goal, however, careful monitoring of patients is required in order to identify early symptoms of exacerbation.

P296
EFFICACY AND SAFETY OF CANNABIS EXTRACT FOR THE TREATMENT OF OSTEOARTHRITIS: A SYSTEMATIC REVIEW OF PRE-CLINICAL AND HUMAN STUDIES

B. J. Abafita[1], A. Singh[1], B. E. Antony[1]

[1]Univ. of Tasmania, Hobart, Australia

Objective: There is increasing interest in the use of various cannabis extracts for the treatment of chronic pain, including OA. This systematic review aimed to evaluate the safety and efficacy of various cannabis extracts for the treatment of OA in both preclinical and human studies.

Methods: A comprehensive literature search was conducted using electronic databases, including Ovid Medline, Embase, CINAHL and Cochrane central register for controlled trials, to identify relevant studies published up to 2023. Studies that investigated the efficacy and safety of cannabis extract for the treatment of OA in pre-clinical and clinical settings were included. The risk of bias of the included studies was assessed using the Cochrane risk of bias tool, independently by two researchers.
Results: Twenty-six (20 pre-clinical and 6 clinical) studies were included in this systematic review. The majority of the studies (n = 20) evaluated the effect of cannabis extract using OA models in both animal and cell studies, as well as in domestic animals with spontaneous OA. These studies assessed the effect of cannabis extract on structural changes (n = 8), modulation of pro-inflammatory effects (n = 8), and pain (n = 13) in OA models. Six clinical studies were also included, which investigated the effect of cannabis extract on pain, quality of life, and functional limitations in individuals with OA. Pre-clinical studies consistently demonstrated chondroprotective, chondrogenerative, and anti-inflammatory effects of cannabis extract in mouse and human chondrocyte models. Additionally, cannabis extract demonstrated analgesic effects by reducing hyperalgesia and mechanical/thermal allodynia in OA animal models. However, the evidence from human studies demonstrated a lack of benefit of cannabis extract in OA. Meta-analysis of four randomized controlled trials (RCTs) found no evidence of improvement in pain (standard mean difference [SMD]: − 0.13; 95% CI = − 0.35 to 0.1). The only RCT reporting quality of life found no evidence of improvement (between group difference 0.03; 95% CI − 0.11 to 0.18). Only one RCT reported on the functional limitation (− 0.1; 95% CI − 1.2 to 2.5) and found no difference between cannabis extract and placebo in OA. Adverse events were mild in severity; however, Meta-analyses of 5 studies indicated that the cannabis extracts group had 7% higher adverse events.
Conclusion: There is consistent evidence from pre-clinical studies to support the chondroprotective, anti-inflammatory, and analgesic effects of cannabis extracts in the OA. However, meta-analyses of limited clinical studies using cannabis extract show no beneficial effects on pain, function, and quality of life in OA.

P297
ROMOSOZUMAB IN THE TREATMENT OF PATIENTS WITH OSTEOPOROSIS AND VERY HIGH RISK OF FRACTURE: A WINDOW OF OPPORTUNITY

B. L. L. Llado[1], L. B. Bernacer[2], A. C. Conesa[3], A. M. Martinez[4], A. C. Cirera[5]

[1]Son Llátzer Univ. Hospital, Palma de Mallorca, [2]Univ. Clinic Hospital of Valencia, Valencia, [3]Univ. General Hospital of Castelló, Castellón, [4]Univ. Hospital Doctor Peset, Valencia, [5]Univ. Hospital Complex of Cartagena, Murcia, Spain

Objective: Osteoporosis (OP) is a chronic disease with decreased BMD and increased risk of fragility fractures (FF), which significantly aggravates morbidity and mortality. OP patients at very high risk of fracture (VHRF) are at increased risk of FF in the two years following incident fracture (imminent risk) and require a more aggressive diagnostic and therapeutic approach. To define the baseline demographic, clinical, biochemical and densitometric characteristics of patients treated with Romosozumab in actual clinical practice. We aimed to evaluate changes in BMD, antifracture effect and changes in bone mineral turnover markers and to assess tolerability and adherence to treatment.
Methods: Multidisciplinary multicenter study with Rheumatology, Internal Medicine and Rehabilitation services, observational, retrospective of a cohort of OP patients with VHRF referred to a Bone Metabolism Unit. Period: October 01, 2022 to December 31, 2023. Criteria: Patients with hip fractures, single or multiple vertebral fractures and patients with VHRF according to SEIOMM criteria, in whom treatment with romosozumab is initiated. Comorbidities, OP and fracture risk factors (FF), bone metabolism parameters, BMD, fractures and pharmacological treatments were analyzed.
Results: A total of 189 women were included, with a mean age of 74 y (42–93). 96% had ≥ 1 recent FF. 76.2% had historical FF (1FF (57.1%), ≥ 2 FF (19.1%)). GFR 73.43 ml/min, calcium 9.3 mg/dL (7.9–10.7), VitD 26.05 ng/mL (5–85), PTH 81.10 pg/mL (16–227), BMD hip − 2.69 (− 5.30 − 0.50), BMD lumbar spine − 2.65 (− 5 − 0.50). History of DM (15.3%), HT (23.8%), CKD 3.2%, neoplasia 14.8%. Of the patients with a history of previous FF (144), 57.7% were on antifracture treatment (51 (29.9%) bisphosphonates, 53 (28%) denosumab, 29 (15.3%) teriparatide, 1 (0.5%) MSRE) and 42.3% were naïve patients who started treatment with romosozumab. Good tolerance was reported during treatment with romosozumab.
Conclusion: A change in the model of care is required that includes the identification and assessment of fracture risk in patients with OP with the aim of identifying those with VHRF and reducing the imminent risk of fracture. A paradigm shift focused on patients with VHRF and based on sequential treatment initiating with a dual-acting osteoformer (romosozumab) provides a new therapeutic option in OP patients with VHRF. A longer-term follow-up is required after completion of the complete 1-y treatment to assess the effectiveness in terms of bone mass gain and the anti-fracture effect.

P298
ROMOSOZUMAB IN DENMARK: A REGISTRY STUDY ON OSTEOPOROSIS PATIENTS

B. Langdahl[1], M. Lorentzon[2], T. T. Borgen[3], C. Alstad[4], E. Bajtner[4], A. Rieem Dun[5], T. Kaarill[4], M. Konradsen[6], E. Tsitlakidis[4], A. Moayyeri[7]

[1]Dept. of Endocrinology, Aarhus Univ. Hospital; Dept. of Clinical Medicine, Aarhus Univ., Aarhus, Denmark, [2]Sahlgrenska Osteoporosis Centre, Dept. of Internal Medicine and Clinical Nutrition, Univ. of Gothenburg; Geriatric Medicine, Sahlgrenska Univ. Hospital; Mary McKillop Institute for Health Research, Australian Catholic Univ., Gothenburg, Sweden, [3]Vestre Viken Hospital Trust, Drammen Hospital, Drammen, Norway, [4]UCB Pharma, Brussels, Belgium, [5]Quantify Research, Stockholm, Sweden, [6]Quantify Research, Copenhagen, Denmark, [7]UCB Pharma, Slough, UK

Objective: Romosozumab was approved in the European Union in December 2019 for the treatment of severe osteoporosis (OP) in postmenopausal women at high risk of fracture and has been reimbursed in Denmark since September 2020. This study is the first to describe the profile of patients selected for romosozumab treatment in Denmark.
Methods: We performed a retrospective cohort study based on data from Danish administrative registries. The study population comprised female patients aged ≥ 50 receiving OP medication during the period September 2020 to October 2023.[1] The study included three cohorts: (i) patients with severe OP treated with romosozumab, (ii) patients with severe OP not treated with romosozumab, and (iii) patients who did not have severe OP and were not treated with romosozumab. Patients were considered as having severe OP if they had sustained a fracture at any skeletal site in the three years before the index date (BMD data were not available in the dataset). The characteristics investigated in the three cohorts included: age, index treatment, comorbidities, OP treatment history, dispensing of drugs that increase risk of falling and fracture, fracture history, and use of glucocorticoids.

Results: Overall, 149,395 patients were included; patient characteristics for each cohort are shown in the Table. In patients treated with romosozumab, we generally observed a younger age and lower instances of comorbidities and glucocorticoid use. Of the 622 patients treated with romosozumab, 277 (44.5%) had not received any prior treatment for OP.

Table. Patient characteristics at index

	Patients treated with romosozumab	Patients not treated with romosozumab	
	Severe OP patients (N=622)	Severe OP patients (N=37,831)	Patients without severe OP (N=110,942)
Age at index, mean ± SD	69.3 ± 8.5	75.8 ± 9.9	72.4 ± 9.7
Index treatment, n (%)			
Oral bisphosphonates[a]	0 (0)	24,897 (65.8)	80,238 (72.3)
Injectable bisphosphonates[b]	0 (0)	7,913 (20.9)	19,268 (17.4)
Denosumab	0 (0)	3,775 (10.0)	10,887 (9.8)
Teriparatide	0 (0)	1,173 (3.1)	253 (0.2)
Raloxifene	0 (0)	50 (0.1)	241 (0.2)
Estrogen	0 (0)	23 (0.1)	55 (0.0)
Romosozumab	622 (100)	0 (0)	0 (0)
OP treatment history, n (%)			
Oral bisphosphonates[a]	282 (45.3)	17,833 (47.1)	58,788 (53.0)
Injectable bisphosphonates[b]	77 (12.4)	3,921 (10.4)	11,181 (10.1)
Denosumab	19 (3.1)	2,638 (7.0)	9,142 (8.2)
Teriparatide	21 (3.4)	1,689 (4.5)	577 (0.5)
Raloxifene	<5 (NA)	76 (0.2)	331 (0.3)
Estrogen	8 (1.3)	386 (1.0)	1,673 (1.5)
Romosozumab	0 (0)	0 (0)	0 (0)
OP treatment naive	277 (44.5)	15,594 (41.2)	36,984 (33.3)
Total Charlson-Quan comorbidity index, mean ± SD	0.4 ± 0.9	0.9 ± 1.4	0.9 ± 1.4
Prevalence of comorbidities, n (%)			
Cardiovascular disease[c]	13 (2.1)	5,449 (14.4)	10,865 (9.8)
Diabetes[d]	9 (1.4)	2,230 (5.9)	4,150 (3.7)
Malignancy	40 (6.4)	4,406 (11.6)	21,803 (19.7)
Drugs that increase risk of falling and fracture,[e] n (%)	551 (88.6)	35,209 (93.1)	92,856 (83.7)
Fracture history in the past 3 years, n (%)			
Hip	79 (12.7)	8,626 (22.8)	0 (0)[f]
Spine	64 (10.3)	4,238 (11.2)	0 (0)[f]
Non-hip non-spine	303 (48.7)	22,547 (59.6)	0 (0)[f]
Osteoporosis with pathological fracture[g]	335 (53.9)	12,338 (32.6)	0 (0)[f]
Fracture history in the past >3 to 5 years, n (%)	112 (18.0)	8,084 (21.4)	9,691 (8.7)
Use of glucocorticoids,[h] n (%)	42 (6.8)	5,556 (14.7)	21,038 (19.0)

[a]Includes: alendronate, etidronate and risedronate. [b]Includes: ibandronate and zoledronate. [c]Includes: myocardial infarction, congestive heart failure, peripheral vascular disease, cerebrovascular disease. [d]Includes: diabetes without chronic complication, diabetes with chronic complication. [e]Includes: antipsychotics (lithium excluded), anxiolytics, hypnotics and sedatives, antidepressants, vasodilators used in cardiac diseases, antihypertensives, diuretics, beta blocking agents, calcium channel blockers, renin-angiotensin system inhibitors, alpha-adrenoreceptor antagonists, dopaminergic agents, opioids. [f]Severe OP was defined as sustaining a fracture in the last three years – any patients with a history of fracture in the past three years would therefore have been included in one of the 'severe OP' cohorts. [g]Hospitals only. Mostly used for patients with fragility vertebral fractures, but may also include patients with hip fracture as fragility vertebral and hip fractures are diagnostic for osteoporosis in Denmark irrespective of BMD [h]Definition of previous glucocorticoid use is based on minimum one dose equivalent to ≥450 mg prednisolone within a three-month time window within the baseline period.

Conclusion: This study provides insight into the patterns and influencing factors of romosozumab use in routine clinical practice across Denmark. Of note, many patients who received romosozumab did so as their initial treatment for OP, which suggests the recommendation for use of osteoanabolic agents as the first line of treatment in high fracture risk patients is being followed.

Reference: [1]Identified by prescription data up to and including August 2023, and hospital registry data up to and including October 2023.

Acknowledgements: Funded by UCB Pharma and Amgen Inc. Medical writing services provided by Costello Medical.

Disclosures: BL: Received fees and honoraria for lectures and advice from Amgen, Astellas, Astra-Zeneca, Gedeon-Richter, Samsung-Bioepis and UCB Pharma; ML: received lecture fees from Amgen, Astellas, Lilly, Meda, Renapharma, and UCB Pharma in addition to consulting fees from Amgen, Consilient Health, Radius Health, Renapharma, and UCB Pharma; TT: Nothing to declare; CA: Employee and stockholder of UCB Pharma; EB: Employee and stockholder of UCB Pharma; ARD: Employee of Quantify Research, a contract research organisation that provides consultancy services to the pharmaceutical industry; TK: Employee of UCB Pharma; MK: Employee of Quantify Research, a contract research organisation that provides consultancy services to the pharmaceutical industry; ET: Significance consultant for UCB Pharma; AM: Employee and stockholder of UCB Pharma.

P299
CLOSING THE OSTEOPOROSIS DIAGNOSIS GAP: INSIGHTS FROM A FEASIBILITY STUDY INTO OPPORTUNISTIC SCREENING FROM WRIST X-RAYS

R. Meertens[1], B. Lopez[2], T. Bean[3], N. Ashley[3], J. Da Palma Lopes[3], P. Lewis[3], J. Shrivastava[3], A. Radcliffe[2], W. Vigers[1]

[1]Univ. of Exeter, Exeter, [2]IBEX Innovations Ltd., Sedgefield, [3]Royal Cornwall Hospital, Truro, UK

Objective: Feasibility study aimed at assessing patient flow from a wrist X-ray to DXA assessment in cohorts presenting with and without a fracture. The primary objectives were to: evaluate whether referral rates to DXA align with the anticipated prevalence of osteoporosis; and explore the practicalities of implementing opportunistic screening software (IBEX BH) which measures wrist bone density from a standard X-ray.

Methods: Anonymised data from the Royal Cornwall Hospital Trust (RCHT) radiology information system (RIS) was audited to assess the rate of DXA referrals for patients over 50 attending for a wrist X-ray. Two cohorts were assessed: those presenting with a fracture and those without. A 6-week random sample of anonymised wrist X-rays were analysed using IBEX BH which measures bone density at the ultra-distal and distal third regions. The outputs were used to assess the likely pick-up rate that could be achieved if the software were part of future service provision.

Results: Between August 2021 and July 2022, 2719 patients had a wrist X-ray which could have been assessed by IBEX BH. 983 (36.2%) presented with a fracture. 192 (19.5%) were referred to DXA within one year, compared to 129 (7.4%) in the non-fracture group. In the fracture group referred to DXA, 54 (28.1%) were recommended treatment, compared to 33 (25.6%) in the non-fracture group. IBEX BH returned a T-score at the ultra-distal region on 86% of the 64 images extracted from the system. 33% of patients were identified as at-risk of central osteoporosis.

Conclusion: The study evidenced that there was a large cohort of patients that received a wrist DR and did not get referred to DXA, evidencing that there is an underserved group of patients who could benefit from opportunistic screening. The study also confirmed for that IBEX BH enables radiology to offer this service improvement, supporting the drive to close the osteoporosis diagnosis gap.

Acknowledgment: The authors extend their appreciation to RCHT.

Disclosure: IBEX Innovations have a commercial interest in the adoption of IBEX BH.

P300
DETRIMENTAL EFFECTS OF PROTON PUMP INHIBITORS ON BONE MINERAL DENSITY ARE NOT MEDIATED BY CHANGES IN SERUM CALCIUM OR PTH IN PATIENTS WITH INFLAMMATORY RHEUMATIC DISEASES: A CROSS-SECTIONAL STUDY

A. Palmowski[1], Z. Boyadzhieva[1], P. Hoff[2], S. Hermann[1], B. Muche[1], D. Simon[1], G. Krönke[1], E. Wiebe[1], F. Buttgereit[1]

[1]Charite Universitätsmedizin, Dept. of Rheumatology, [2]Endokrinologikum, Berlin, Germany

Objective: In a previous study, we found daily proton pump inhibitor (PPI) intake to be associated with decreased BMD of the femoral neck and the lumbar spine in patients with inflammatory rheumatic diseases (IRMDs) even after comprehensive adjustment for confounders [1]. The underlying pathomechanism is unclear. Similar findings in other populations in the past were repeatedly explained by decreased intestinal calcium absorption and increased levels of intact serum

PTH [2, 3]. We aimed to assess whether daily PPI use is associated with changes in serum calcium or PTH in patients with IRMDs.

Methods: We used cross-sectional baseline data from the single-center Rh-GIOP cohort [4]. Patients with IRMDs have been prospectively enrolled since 2015. Included patients receive DXA scans, laboratory testing and complete bone-health-related questionnaires. This study excluded patients with hyperthyroidism and multiple myeloma as treatable causes of secondary osteoporosis. The exposure—daily PPI use—was ascertained by a combination of self-reporting by patients and chart review. Co-primary outcomes were serum levels of calcium and PTH. Analyses were based on general linear models, considering complete cases only. As part of a gate-keeping procedure, adjusted analyses were performed for the respective outcomes only if unadjusted analyses identified statistically significant differences between PPI users and non-users. For adjustment, we used (1) a conventional multiple regression approach and (2) inverse probability of treatment weighting. Potential confounders were based on findings from literature review and expert opinion and included age, BMI, self-reported degree of physical activity, smoking status, presence of diabetes mellitus type I or II, chronic kidney disease stage (based on the estimated glomerular filtration rate), cumulative and current glucocorticoid (GC) dose and serum C-reactive protein. For weighting, included covariates were allowed to affect the outcome only [5], so 25-OH-vitamin D deficiency was additionally included. A sensitivity analysis excluded patients with a prior diagnosis of hyperparathyroidism.

Results: 1504 patients (75.3% women; mean age 62.6 ± 13.1 y; 49% with daily PPI use) were included (Table 1). Most patients (79.6%) received vitamin D3 supplements and were within normal ranges as measured by 25-OH-vitamin D3. Missingness regarding exposure and outcome variables was as follows: PPI use: 0%; calcium: 7%; PTH: 17%. In the unadjusted analyses, serum PTH was higher in PPI users (difference = 2.49 pg/mL; 95% CI 0.23–4.74; p = 0.031). Serum calcium was similar in PPI users and non-users and omitted from further adjusted analyses. After adjustment for confounders, statistically significant differences in serum PTH between PPI users and non-users vanished with both adjustment procedures (Fig. 1). In the conventional multiple regression model, age, BMI, chronic kidney disease stage and current GC intake were statistically significantly associated with serum PTH. These results were consistent in the sensitivity analysis which excluded patients with a prior diagnosis of hyperparathyroidism.

Table 1. Patient characteristics stratified by proton pump inhibitor use. Numbers are n (%), mean (standard deviation) or median [interquartile range]. PPI, proton pump inhibitor; GC, glucocorticoid. [a]Fractures due to inadequate trauma or fall from standing height - History of fractures was self-reported and/or verified from patient charts. [b]Any kind of self-reported physical activity. [c]According to CDC recommendations (https://www.cdc.gov/obesity/basics/adult-defining.html). [d]Classification according to local laboratory reference values. [e]Based on eGFR by KDIGO guidelines (https://kdigo.org/guidelines/ckd-evaluation-and-management/).

	Daily PPI Intake	
	Yes (n=740)	No (n=764)
Age (y)	63.40 (13.00)	61.86 (13.09)
Type of IRMD, no. (%)		
Rheumatoid arthritis	246 (33.2)	317 (41.5)
Connective tissue disease	214 (28.9)	166 (21.7)
Vasculitis	163 (22.0)	78 (10.2)
Spondyloarthropathy	67 (9.1)	148 (19.4)
Other	50 (6.8)	55 (7.2)
Women, no. (%)	552 (74.6)	582 (76.2)
Alcohol consumption, no. (%)		
None	379 (52.2)	303 (39.8)
Irregular/infrequent	299 (41.2)	399 (52.4)
Occasional	37 (5.1)	50 (6.6)
Frequent	11 (1.5)	9 (1.2)
Smoking, no. (%)		
Never	371 (50.5)	382 (50.2)
Former	237 (32.3)	261 (34.3)
Current	126 (17.2)	118 (15.5)
Physical activity, no. (%)[b]		
None	307 (51.1)	240 (37.1)
1 time/week	80 (13.3)	98 (15.1)
2-3 times/week	113 (18.8)	180 (27.8)
4-6 times/week	22 (3.7)	38 (5.9)
Daily	79 (13.1)	91 (14.1)
Left femoral neck T-score	-1.28 (1.12)	-1.03 (1.10)
Lumbar spine T-score	-0.92 (1.46)	-0.70 (1.48)
CRP (median [IQR])	2.40 [0.90, 7.27]	3.20 [1.00, 10.60]
Cumulative GC dose, g	5.97 [1.01, 19.63]	7.40 [1.52, 22.55]
Current GC dose, no. (%)		
0mg/d	196 (26.5)	355 (46.5)
>0 mg/d to <5 mg/d	101 (13.6)	113 (14.8)
5 mg/d to 7.5 mg/d	223 (30.1)	167 (21.9)
>7.5 mg/d	220 (29.7)	129 (16.9)
Prior vertebral fractures, no. (%)[a]	58 (7.8)	43 (5.6)
Prior non-vertebral fractures, no. (%)[a]	235 (31.8)	208 (27.2)
Diabetes mellitus, no. (%)	94 (12.7)	71 (9.3)
BMI, no. (%)[c]		
Underweight	28 (3.8)	12 (1.6)
Healthy weight	251 (33.9)	306 (40.1)
Overweight	263 (35.5)	271 (35.5)
Obese	198 (26.8)	175 (22.9)
25-OH vitamin D3 deficiency, no. (%)[d]		
no deficiency (>50 nmol/L)	522 (85.6)	574 (82.8)
subclinical (25-50 nmol/L)	20 (3.3)	11 (1.6)
clinically relevant (<25 nmol/L)	68 (11.1)	108 (15.6)
Chronic kidney disease stage, no. (%)[e]		
normal or high	181 (25.7)	194 (27.2)
mildly decreased	364 (51.7)	419 (58.8)
mildly to moderately decreased	101 (14.3)	68 (9.5)
moderately to severely decreased	43 (6.1)	27 (3.8)
severely decreased	12 (1.7)	4 (0.6)
kidney failure	3 (0.4)	1 (0.1)

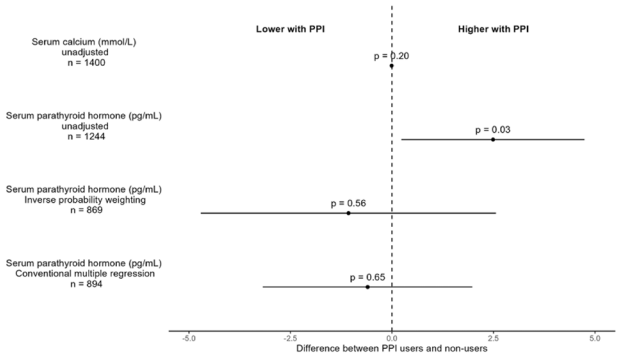


Figure 1. Differences between proton pump inhibitor users and non-users in serum calcium, PTH and phosphate (numbers are estimated marginal means from general linear models). Error bars represent 95%CIs. PPI, proton pump inhibitor.

Conclusion: In our cohort of patients with IRMDs, the previously observed reduction in bone density with PPI does not seem to be mediated by changes in serum calcium or PTH. Prior studies with such findings might have been subject to confounding.

References:

1. Palmowski A, et al. Proton pump inhibitor use and bone health in patients with rheumatic diseases: A cross-sectional study. Accepted in: Mayo Clinic Proceedings
2. Fitzpatrick D, et al. Osteoporos Int 2023;34:1917
3. Hinson AM, et al. J Am Geriatr Soc 2015;63:2070
4. Wiebe E, et al.. Ann Rheum Dis 2022;81:1313
5. Brookhart MA, et al. Am J Epidemiol 2006;163:1149

P301
DOES COXARTHROSIS PREDISPOSES INTRACAPSULAR OR EXTRACAPSULAR HIP FRACTURE?

B. Mur Molina[1], L. A. Hernandez-Sanchez[1], A. Gil González[2], B. Alonso Alvarez[1], S. Miranda Bautista[1], B. Palomino Aguado[1]

[1]Hospital Universitario Ramón y Cajal, [2]Fundación Jiménez Díaz, Madrid, Spain

Objective: Evaluate the relationship between the degree of coxarthrosis and the type of fracture pattern of hip fracture.

Methods: Retrospective analytical study. We included all patients admitted for proximal femur fracture in our Hospital between January 2021 and January 2022. Demographic data, age, functional status (trough Bartel index (BI) and gait evaluation scale), type of femur pattern fracture, presence of coxarthrosis and its severity according to Kellgren's radiological classification scales and Lawrence and Tonnis on the fractured side.

Results: 240 patients were included (78.5% women). The average age was 86.9 y (SD 8.7). Functionally, they presented mild dependence (BI 70, SD 24) and independent ambulation (FAC 3.5 SD 1.3). 83.5% lived at home. The most common types of fracture were displace intracapsular fractures (41.9%) and pertrochanteric (41.5%), followed by subtrochanteric (14.1%) and nondisplaced intracapsular fracture (2.5%). The 34.4% of patients presented minimal coxarthrosis in the x-ray on admission, 45.6% moderate coxarthrosis, 14.5% severe coxarthrosis and 5.4% doubtful coxarthrosis. Of the patients who presented coxarthrosis severe 71.4% suffered an extracapsular fracture (pertrochanteric or subtrochanteric) and 26.6% an intracapsular fracture. Of the patients with non-severe coxarthrosis (85.4%), 52.9% suffered an extracapsular fracture, while 47.1% presented an intracapsular. A relationship was evident statistically significant between the degree of coxarthrosis (severe vs. not severe) and fracture pattern (extracapsular vs. intracapsular) $p = 0.042$.

Conclusion: In our study patients with severe radiological coxarthrosis presented more frequently extracapsular fractures of hip fracture.

P302
CASE OF OSTEOPOROSIS IN MAN DUE TO LOW TESTOSTERONE

B. Rexhepi-Kelmendi[1], M. Rexhepi[1]

[1]Univ. Clinical Centre of Kosova, Rheumatology Clinic, Prishtina, Kosovo, Albania

Men's osteoporosis is a dangerous condition that is underdiagnosed, undertreated, and frequently made worse by fragility fractures and the morbidity and mortality they cause.

Although testosterone plays a very little influence in bone health when compared to other parameters like estradiol levels, male hypogonadism is linked to fragility fractures and low bone mass.

Case report: We describe the case of a 50-year-old man who presents with low back pain, developed several spinal compression fractures several years ago, and was followed from orthopedic surgeon and physiatrist. In 2023 was admitted in Rheumatology Clinic and diagnosed with listhesis at L5/S1, asymmetrical lysis at L3, and a right L5/S1 disc bulge with limited S1 nerve root contact after he presented with chronic low back discomfort. The patient had osteoporosis as determined by DXA, despite the fact that he did not exhibit any clear risk factors for bone fragility (lumber spine: T-score—2.8 standard deviation [SD]; femoral neck: T-score—1.2 SD). Serum 25-hydroxyvitamin D level was deficient (16 ng/mL), testosterone was very low 2.3 ng/mL (3.50–8.60), PTH was 50.87 pg/ml. Rehabilitation and therapeutic medication intervention from rheumatologist and endocrinologist were started.

Conclusion: Even though low back discomfort doesn't seem typical, it should be extensively checked for severe bone diseases if it does not go away.

P303
IMMUNOGENICITY OF INACTIVATED TRIVALENT INFLUENZA SPLIT-VACCINE IN PATIENTS WITH ANKYLOSING SPONDYLITIS AND PSORIATIC ARTHRITIES

M. M. Baranova[1], N. V. Muravyeva[1], B. S. Belov[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To study the immunogenicity of inactivated trivalent influenza split-vaccine in patients with ankylosing spondylitis (AS) and psoriatic arthritis (PsA).

Methods: The open prospective study included 28 patients with AS and 12 patients with PsA; 34 males; mean age 40.5 ± 10.5; mean disease duration was 2.55 ± 1.93 y. At the moment of inclusion in the study, the disease activity in patients with AS according to the BASDAI index was 2.55 ± 1.93; disease activity in patients with PsA according to the DAPSA index – 12.47 ± 7.06. The majority of patients (72.5%) received immunosuppressive therapy: 22 biological disease-modifying anti-rheumatic drugs (bDMARDs) ± conventional DMARDs, 7 methotrexate/leflunomide, 1 tofacitinib. 22 people without immuno-inflammatory rheumatic disease were in the control group (CG). Inactivated trivalent influenza split-vaccine was injected in an amount of 1 dose (0.5 ml) into the deltoid muscle of the shoulder against the background of anti-rheumatic therapy. The level of

antibodies (AT) of class G to hemagglutinin (HA) of influenza A(H1N1), A(H3N2) and influenza B was assessed at baseline (visit I), 1–3 months (visit II) and 6 months (visit III) after vaccination.

Results: At the first, second and third visits the levels of AT, determined in units of optical density, were (M ± σ): 0.58 ± 0.19; 0.78 ± 0.17; 0.71 ± 0.18 for AT to HA of influenza A(H1N1), 0.76 ± 0.26; 1.01 ± 0.21; 0.93 ± 0.22 for AT to HA of influenza A(H3N2), 0.79 ± 0.18; 0.95 ± 0.09; 0.9 ± 0.11 for AT to HA of influenza B. In the CG, similar levels were: 0.88 ± 0.31; 1.04 ± 0.24; 0.95 ± 0.28 for AT to HA of influenza A(H1N1), 0.78 ± 0.32; 0.98 ± 0.31; 0.85 ± 0.3 for AT to HA of influenza A(H3N2), 0.89 ± 0.16; 0.86 ± 0.15; 0.92 ± 0.15 for AT to HA of influenza. After vaccination the levels of AT to HA of influenza A (H1N1), A (H3N2) and B were significantly ($p < 0.006$) higher compared to baseline values in both groups (patients with SpA and CG). The baseline level of AT to HA of influenza A (H1N1) was higher in the CG than in the group of patients with AS and PsA ($p = 0.0006$), later these differences remained (pII = 0.0002, pIII = 0.006). The levels of AT to HA of influenza A(H3N2) and influenza B were comparable between groups at all three visits.

Conclusion: The data obtained indicate sufficient immunogenicity of the inactivated trivalent influenza split-vaccine in patients with AS and PsA, including those receiving immunosuppressive therapy.

P304
FREQUENCY AND STRUCTURE OF SERIOUS INFECTIONS IN PATIENTS WITH SPONDYLOARTHROPATHY TREATED WITH VARIOUS ANTI-RHEUMATIC DRUGS

M. M. Baranova[1], N. V. Muravyeva[1], B. S. Belov[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To determine the frequency and structure of serious infections (SIs, defined as life-threatening infections requiring hospitalisation and intravenous antibiotic therapy) in patients with spondyloarthropathy (SpA) treated with various anti-rheumatic drugs.

Methods: The one-time retrospective study considered the 332 SpA patients (206 ankylosing spondylitis, 98 psoriatic arthritis, 26 undifferentiated SpA, 2 inflammatory bowel disease-related arthritis; 190 males; mean age 39.5 ± 12.1; median disease duration 9 [4;16] y). The patients were interviewed by a research physician with the completion of a unified questionnaire in the period from 2020–2021. Additional information was obtained from medical records. 60% of patients have never smoked. The Charlson comorbidity index was 0 in 157 patients, 1 in 79 patients, 2 in 37 patients, 3 and more in 59 patients. 102 (31%) treated with biological disease-modifying anti-rheumatic drugs (bDMARDs) as monotherapy or in combination with conventional DMARDs/steroids. 112 (34%) have not received immunosuppressive therapy.

Results: The overall incidence of SIs was 63. The most frequent infections (63.5%) were respiratory tract infections (pneumonia, n = 21, including the caused Sars-CoV-2, n = 12; acute bronchitis, n = 2; acute tonsillitis, n = 9; acute sinusitis, n = 5; acute otitis, n = 2; Sars-CoV-2 without lung damage, n = 1), followed by gastrointestinal infections (n = 9), skin and soft tissue infections (n = 6), urinary tract and genital infections (n = 5). Festering arthritis, tuberculosis and neurotoxicosis were single cases. Treatment with tumour necrosis factor inhibitors (OR 2.25, 95% CI 1.22–4.14; p = 0.01) and bDMARDs (OR 1.94, 95% CI 1.06–3.55; p = 0.03) were associated with SIs.

Conclusion: Given the potential danger of SIs, their study in patients with SpA is very relevant. In addition, taking into account the leading place of respiratory tract infections in the structure of SIs in SpA patients, issues of their prevention (including vaccination) require special attention, especially among patients receiving bDMARDs.

P305
IMMUNOGENICITY AND CLINICAL EFFICACY OF 23-VALENT PNEUMOCOCCAL POLYSACCHARIDE VACCINE IN PATIENTS WITH ANKYLOSING SPONDYLITIS AND PSORIATIC ARTHRITIES

M. M. Baranova[1], N. V. Muravyeva[1], B. S. Belov[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To study the immunogenicity and clinical efficacy of 23-valent pneumococcal polysaccharide vaccine (PPV-23) in patients with ankylosing spondylitis (AS) and psoriatic arthritis (PsA).

Methods: The open prospective study included 51 patients with AS and 25 patients with PsA; 55 males; mean age 41.5 ± 11.5; mean disease duration was 11.0 ± 8.4 y. At the moment of inclusion in the study, the disease activity in patients with AS according to the BASDAI index was 4.3 ± 2.0; disease activity in patients with PsA according to the DAPSA index—23.8 ± 17.9. The majority of patients (65.8%) at the time of inclusion in the study received immunosuppressive therapy: 15 methotrexate, 2 leflunomide, 21 TNFα inhibitors (including in combination with conventional disease-modifying anti-rheumatic drugs—DMARDs, n = 9), 11 IL-17 inhibitors (including in combination with conventional DMARDs, n = 5), 1 tofacitinib. PPV-23 was injected in an amount of 1 dose (0.5 ml) into the deltoid muscle of the shoulder against the background of anti-rheumatic therapy. Initially (visit I), 1 (visit II), 3 (visit III) and 12 (visit IV) months after vaccination, the level of antibodies to pneumococcal capsular polysaccharide was assessed using the EIA PCP IgG kit (TestLine Clinical Diagnostics s.r.o., Czech Republic). The clinical efficacy of PPV-23 was evaluated after 12 months.

Results: The dynamics of antibody concentration to pneumococcal capsule polysaccharide is presented in the Table.

Table 1. Concentration of pneumococcal antibodies in patients with AS and PsA, U/ml, Me [25th, 75th percentiles]*.

Visit I (n=71)	Visit II (n=60)	Visit III (n=60)	Visit IV (n=59)
50.7 [23.6; 137.5]	149.4 [59.0; 247.7]	88.1 [37.5; 232.3]	113.2 [41.6; 206.3]

*pI-II,I-III,I-IV≤0,002

After 1, 3 and 12 months after vaccination, a significant increase in the concentration of antibodies to pneumococcal capsular polysaccharide was observed compared with the initial indications. Vaccination against pneumococcal infection was effective in 98.7% of patients: after 12 months of observation, there were no clinical and radiological symptoms of the lower respiratory tract infections. In one patient, 3 weeks after vaccination with PPV-23, the development of bilateral polysegmental pneumonia, presumably of bacterial etiology, was documented. In this patient, the post-vaccination period was insufficient for the formation of a full-fledged immunity. In addition, another genesis of pneumonia is not excluded, since microbiological examination of sputum has not been carried out.

Conclusion: The data obtained indicate sufficient immunogenicity and clinical efficacy of PPV-23 in patients with AS and PsA. Further studies are needed to assess the effect of the therapy on the immunogenicity of PPV-23, as well as the clinical efficacy of this vaccine.

P306
INTERCONNECTION OF BONE LOSS, OSTEOPOROSIS, AND ASEPTIC LOOSENING IN JOINT ARTHROPLASTY: A COMPREHENSIVE REVIEW

B. S. Bolos[1], E. Popescu[2], C. E. Georgescu[2], A. L. Dimitriu[3], R. Ene.[3]

[1]Bucharest Emergency Clinical Hospital-Orthopaedics and Traumatology Dept., Carol Davila Univ. of Medicine and Pharmacology, [2]Bucharest Emergency Clinical Hospital-Orthopaedics and Traumatology Dept., [3]Bucharest Emergency Clinical Hospital-Orthopaedics and Traumatology Dept., Carol Davila Univ. of Medicine and Pharmacology, Bucharest, Romania

Objective: As the world's population ages and life expectancies rise, musculoskeletal disorders and diseases like osteoporosis, fractures, and bone metastases are becoming more common. Bone reactions to orthopedic implant materials are crucial determinants of the implant's success. This article underscores the importance of a holistic approach in managing osteoporosis-related complexities for successful joint replacement.
Methods: Based on a comprehensive review of the literature on the materials and biocompatibility of orthopedic implant, examining factors such as material composition, surface properties and tissue reactions.
Results: Currently, orthopedics uses two main types of implants: osteosynthesis devices for fracture repair and prosthetics for joint replacements. These implants' success relies on their mechanical properties and their interaction with the surrounding biological environment. Because of its great strength, low density, and superior corrosion resistance, titanium and titanium alloys are preferred structural materials. However, alternative metallic alloys not based on titanium are used in orthopedic implants. Because of their great mechanical qualities, excellent wear resistance, and resistance to corrosion, Co and Cr are extremely compatible and frequently utilized as orthopedic implant materials in clinical procedures like hip and knee replacement. (2) Complications related to these orthopedic biomaterials and bone can arise in some clinical outcome from several factors such as: inflammation and infection (3), implant loosening (4), stress shielding (5), allergic reactions (6), poor biocompatibility, material wear and debris (7) which must be correlated with biological status of the patient. The intricate relationship among bone loss, osteoporosis, and aseptic loosening, particularly in the context of joint arthroplasty, nowadays are critically evaluated. Osteoporosis, a systemic skeletal disorder characterized by decreased bone density and microarchitectural deterioration, emerges as a key precursor to bone loss, amplifying the challenges in orthopedic procedures. Aseptic loosening is a complication often observed in joint replacements and is the cause of revision of major arthroplasties. Several theories on the cause of aseptic loosening have been proposed but the most principal factors are wear debris particles that simulate a local inflammatory response and osteoclastic bone resorption, sometimes related to endocrine disorders (4,7). Preoperative assessment of bone health is crucial for osteoporotic patients undergoing joint replacement.
Conclusion: In context of joint replacement, osteoporosis poses challenges related to bone quality, affecting the stability and long-term success of prosthetic implants. Understanding how varied materials influence tissue reactions is crucial for advancing implant technology and optimizing patient outcomes. Orthopedic implants play a pivotal role in restoring function and improving the quality of life for individuals with musculoskeletal conditions. For a metallic material to be suitable as biomaterial, it should meet a series of desired properties ranging from mechanical to biocompatibility (not toxic to environmental cells and tissues, quickly integrated in the body, corrosion resistant).
References:

1. Mirea R, et al. Materials 2021;14:2774
2. Mirea R, et al. Metals 2021;11:857
3. Lupescu O, et al. Rom J Morphol Embryol 2016;57:1137
4. Popescu D, et al. Revista Acta Endocrinologica, Bucharest 2015; vol XI (1)
5. Liverani E, et al. J Mech Behav Biomed Mater 2021;121:104608
6. Teo WZW, Schalock PC. Dermatol Ther 2017;7:53
7. Abu-Amer Y, et al. Arthritis Res Ther 2007;9(Suppl1):S6

P307
EFFECTIVENESS OF GLOBAL POSTURAL REEDUCATION IN CHRONIC LOW BACK PAIN

B. S. Bouden[1], Z. S. Zanned[1], R. L. Rouached[1], B. A. Ben Tekaya[1], M. I. Mahmoud[1], S. O. Saidane[1], A. L. Abdelmoula[1]

[1]Rheumatology Dept., Charles Nicolle Hospital Tunis, Tunis, Tunisia

Objective: Chronic low back pain (LBP) is one of the most common musculoskeletal disorders. It represents a healthcare issue as it is often associated with loss of work productivity and thus huge economic burden. Several physiotherapeutic strategies may be used during the treatment. We aimed to compare global postural reeducation (GPR) to a conventional rehabilitation protocol for improving pain, flexibility, function, and psychological impact in patients with chronic LBP.
Methods: A randomized, controlled, clinical trial with a single blinded examiner was conducted. Patients with chronic LBP were randomly allocated to 2 groups: group control received the conventional rehabilitation protocol alone and group GPR received the conventional protocol associated to GPR. Both groups were followed a 3 sessions per week over a period of 4 weeks. Evaluations were performed at the start of the study and 4 weeks after. We used the Oswestry scale to assess disability, visual analog scale (VAS) to evaluate pain and the Hospital Anxiety Depression the (HAD) scale in its Arabic validated version to evaluate depression.
Results: We included 26 patients with common LBP (13 in the control group and 13 in the GPR group). Mean age was 45 y in the control group and 46 y in the GPR group. Mean duration of back pain was 18 months. Mean body weight was 73 kg [60–88] in the control group and 72 kg [60–87] in the GPR group. 84.61% were obese or overweight (BMI $\geq$ 25). All the patients had a sedentary lifestyle. The GPR associated group demonstrated significant statistical improvements in the VAS ($p = 0.01$), lumbar mobility ($p = 0.02$) and Oswestry scale ($p = 0.04$) at the four weeks' evaluation. Likewise HAD score decreased significantly in the GPR group (11–3.6; $p = 0.01$).
Conclusion: GPR associated to the conventional rehabilitation seems to be an effective tool in the management of common LBP and its related psychological impact.

P308
CASE REPORT IN A PATIENT WITH OSTEOGENESIS IMPERFECTA

B. T. Todorova[1]

[1]Univ. Clinic of Endocrinology, Diabetes and Metabolic Disorders, Skopje, North Macedonia

Osteogenesis imperfecta is a genetic disease manifested by increased bone fragility, low bone mass and other manifestations of connective tissue. 85–90% are associated with pathogenic variants of the COL1A1 and COL1A2 genes. It is mostly inherited as an autosomal dominant disorder. The incidence is 1:20,000 live births.
Casereport: A 22-year-old female patient. She was diagnosed with nanosomy at the age of 5, and MRI scan confirmed the diagnosis of

empty sella syndrome with ectopic neurohypophysis. Due to thyroxine deficiency, she was put on levothyroxine. The GnRH activity at the age of 13 was low, therefore puberty was induced with combined oral contraceptives (ethynyl estradiol/drospirenone). The first sign of OI (curvature of the legs) was noticed at the age of 12. She has blue sclerae, a triangular face. Several doses of growth hormone were given due to hypopituitarism. It prevented the occurrence of fractures. However, in the postpubertal period, the patient marks multiple fractures in the upper and lower extremities. (1). Fractures: Condition after a fracture of the right radius in the distal part and the styloid process of the right ulna conservatively resolved with plaster immobilization (2017 year), Fractura et VLC phalangis distalis digiti mani IV lat. dex., Contusio reg. phalangis digiti minimi l. dex. (2015 year), St post conquasatio dig. IV, V manii dex (2015 year), St. post fracturam radii part distalis (2014 year). Positive family history-cousin, nephews of cousin with osteogenesis imperfecta. The DXA scan revealed low bone density, and the genetic testing confirmed the diagnosis of type I OI. The patient was started on treatment with Ibandronic acid and supplements containing calcium, vitamin K and vitamin D3. She responded adequately to the therapy and, at the age of 27, wanted to achieve pregnancy. She was informed about the pattern of inheritance of OI, but still wanted to proceed. The patient was started on GnRH replacement therapy and in-vitro fertilization was performed. She delivered a healthy female newborn via cesarean section on the 39th gestational week.

Conclusion: OI is a diagnostic challenge and can often be masked by other conditions. Prompt evaluation of multiple fractures is essential for establishing the correct causative agent. Multidisciplinary approach is the cornerstone of patient management.

P309
ROLE OF EDUCATIONAL PROGRAMS IN PREVENTION OF FRACTURES IN PATIENTS WITH OSTEOPOROSIS

B. Zavodovsky[1], L. Sivordova[1], Y. Polyakova[1], E. Papichev[1], Y. Akhverdyan[1]

[1]Federal State Budgetary Institution "Zborovsky Research Institute of Clinical and Experimental Rheumatology", Volgograd, Russia

Objective: The problem of osteoporosis (OP) is of great socio-economic importance [1, 2]. The aim of the study. The aim of our study was to evaluate the effect of compliance in patients with osteoporosis on the incidence of new low-traumatic fractures.

Methods: Design: Prospective study in two stages. The analysis included outpatient records of 2236 patients aged 40–92 y.

Results: According to the results of the first stage of the study, it was shown that 715 patients (31.98% of all included in the study) applied once, of which 115 had a history of low-traumatic fractures. These patients made up the I control group. Of these, 509 (71%) had low bone mass. But these patients refused to study at the school for patients and did not seek treatment, 26.51% patients reported new low-traumatic fractures. The remaining 68.02% of all included in the study were fully examined and regularly observed at the Osteoporosis Center. Of these, 82.97% patients had low bone mass. These patients were trained in the school of osteoporosis and were prescribed anti-osteoporotic therapy. Of these, 62.12% fully complied with the recommendations of doctors, these patients constituted the II group (highly compliant patients). Among these patients, only 11 new low-traumatic fractures (1.4%) were registered. Group III (low compliance patients) consisted 37.88% who only partially complied with the recommendations of doctors. In this group, 8.79% were identified new low-traumatic fractures.

Conclusion: The education of patients with OP in schools for patients is of great importance in the prevention of new fractures.

References:

1. Lavrova D, et al. Ann Rheum Dis 2018;77:1227
2. Gladkova EN, et al. Aging Clin Exper Res 2023;35(S1):429

P310
ADVANTAGES OF INTRA-ARTICULAR THERAPY WITH SODIUM HYALURONATE IN THE THERAPY OF GONARTHROSIS

B. Zavodovsky[1], L. Sivordova[1], Y. Polyakova[1], E. Papichev[1], Y. Akhverdyan[1]

[1]Federal State Budgetary Institution "Zborovsky Research Institute of Clinical and Experimental Rheumatology", Volgograd, Russia

Objective: Diseases of the musculoskeletal system (MSS) occupy third place in the structure of morbidity in the Russian Federation. The most common form of MSS pathology is osteoarthritis (OA), and its prevalence is increasing every year [1,2]. We aimed to assess the dynamics of pain syndrome during the sodium hyaluronate solution in comparison with the bioactive concentrate of small sea fish in patients with osteoarthritis (OA) knee joint.

Methods: Prospective, comparative, randomized, single center study, 12 months. The study included 180 patients with gonarthrosis. 50 patients were intra-articularly injected with sodium hyaluronate solution. 30 patients—bioactive concentrate of small sea fish (BACSSF), intra-articularly. 100 patients—BACSSF, intramuscularly.

Results: The most rapid and pronounced decrease in the VAS index was obtained with the use of sodium hyaluronate: in the 1st week by 31%, in the 2nd week—48%, by the 3rd month − 49.1% ($p < 0.001$). The effectiveness of therapy remained after 12 months: the level of the VAS index was − 19.9 mm (− 32%) ($t = 47.23$; $p < 0.001$). In other groups, the speed, degree of pain reduction and duration of the effect were also significant ($p \leq 0.05$), but the effectiveness of therapy was statistically significantly lower. In addition, intra-articular administration of sodium hyaluronate provided a significant reduction in the need for NSAIDs ($p < 0.001$).

Conclusion: Thus, a domestically produced synovial fluid prosthesis, made without the use of animal raw materials, completely purified from hyaluronidases, can be recommended to reduce pain in grade I–III gonarthrosis.

References:

1. Zavodovsky BV, et al. Terapevticheskij Arkhiv 2016;88:78.
2. Portyannikova OO, et al. Modern Rheumatol J 2019;13:105

P311
EVALUATING THE IMPACT OF DIVERSE FACTORS ON THE DETERIORATION OF TWO-MINUTE WALKING AND TIME-UP-AND-GO TEST PERFORMANCES: A COMPREHENSIVE EVALUATION OF AT LEAST A 5-YEAR FOLLOW-UP STUDY ON PRIMARY TOTAL KNEE ARTHROPLASTY PATIENTS

P. Ruangsomboon[1], C. Anusitviwat[2], A. Unnanuntana[1]

[1]Dept. of Orthopaedic Surgery, Faculty of Medicine, Siriraj Hospital, Mahidol Univ., Bangkok, [2]Dept. of Orthopedics, Faculty of Medicine, Prince of Songkla Univ., Songkhla, Thailand

Objective: The 2-min walk test (2MWT) and timed up-and-go test (TUG) are performance-based tests (PBTs) used alongside patient-reported outcome measures (PROMs) to assess functional recovery after total knee arthroplasty (TKA). This study examined PBTs and

PROMs over a minimum 5-year follow-up period after TKA and identified factors associated with declined PBTs.
Methods: We tracked a TKA cohort who were previously involved in a prior 2MWT study conducted between 2013–2015. Participants' PROMs (modified WOMAC), modified Knee Score, Oxford Knee Score, Numeric Pain Rating Scale) and PBTs (2MWT and TUG) were evaluated during a minimum follow-up of 5 y. Analysis of variance (ANOVA) assessed PBTs and PROMs at various time points. Survivorship, indicated by no need for subsequent surgery, was analyzed using the Kaplan–Meier (KM) survival estimator. A generalized linear mixed model identified potential risk factors for PBT deterioration.
Results: The latest follow-up time was 7.4 $\pm$ 2.3 y. The mean age of the 126 participants was 77.8 years, with 89.7% women. The 2MWT and TUG exhibited nonsignificant functional decline, while all PROMs remained stable. Only hospitalization for complex medical conditions or recent trauma worsened the PBTs. KM analysis indicated a 98.8% survivorship at 7.6 y.
Conclusion: The PBTs of the patients significantly worsened after hospitalization for complex medical illnesses or recent trauma at the midterm follow-up. These factors should be considered when assessing postoperative function after TKA.

P312
EARLY HIP FRACTURE SURGERY WITHIN 24 HOURS DID NOT REDUCE THE MORTALITY RATE BUT RESULTED IN A LOWER LENGTH OF STAY AND REDUCED THE NEED FOR POSTOPERATIVE PAIN RESCUE

A. Unnanuntana[1], C. Anusitviwat[2], V. Lertsiripatarajit[3], P. Riawraengsattha[3], M. Raksakietisak[3]

[1]Dept. of Orthopaedic Surgery, Faculty of Medicine, Siriraj Hospital, Mahidol Univ., Bangkok, [2]Dept. of Orthopedics, Faculty of Medicine, Prince of Songkla Univ., Songkhla, [3]Dept. of Anesthesiology, Faculty of Medicine, Siriraj Hospital, Mahidol Univ., Bangkok, Thailand

Objective: There was no report on the results of early hip fracture surgery within 24 h and comparison between early and late surgery in patients who underwent hip fracture surgery in Thailand. This study was conducted to explore the postoperative complications and mortality rates following early hip fracture surgery and to compare the outcomes between patients who received early and late hip fracture surgery.
Methods: The hip fracture patients who underwent operative treatment were retrospectively reviewed. Patients aged more than 50 y with at least 12 months of follow-up were included. Patients diagnosed with multiple fractures, fractures from high-energy trauma, pathological fractures, or insufficient data were excluded. The comprehensive management from a multidisciplinary care team was applied to all patients. The postoperative complications, in-hospital, 30-d and 1-y mortality rates after hip fracture surgery were analyzed and compared between the early surgery within 24 h and later than 24 h.
Results: A total of 276 patients were included in this study. Most patients (77.9%) underwent surgery within 24 h. Patients with early surgery had a shorter length of stay (6 (4, 9) vs. 8 (7, 13), $p < 0.001$) and needed fewer rescue analgesia 24-h postoperatively (15.8 vs. 27.9%, $p = 0.032$). The 30-d and 1-y cumulative mortality rates were only 1.1% and 2.5%. The two most common postoperative complications were anemia (43.1%) and acute kidney injury (32.6%). There were no statistically significant differences in mortality rates and postoperative complications between early and late surgery.
Conclusion: Hip fracture patients who underwent surgery with a multidisciplinary care team had low overall mortality rates. Early surgery could shorten the length of hospital stay and reduce postoperative pain. However, surgery within 24 h did not have a positive effect on the mortality and complication rates of hip fracture patients.

P313
GORHAM STOUT DISEASE: PRELIMINARY STUDY ON THE INVOLVEMENT OF THE ENDOCANNABINOID SYSTEM AND AUTOPHAGY IN THIS EXTREMELY RARE SYNDROME

C. Aurilia[1], G. Palmini[2], S. Donati[1], I. Falsetti[1], G. Galli[1], T. Iantomasi[1], L. Funaro[3], G. Picchioni[3], M. L. Brandi[2]

[1]Dept. of Experimental and Clinical Biomedical Sciences, Univ. of Florence, [2]Fondazione Italiana Ricerca sulle Malattie dell'Osso, F.I.R.M.O Onlus, [3]Stabilimento Chimico Farmaceutico Militare (SCFM), Agenzia Industrie Difesa (AID), Florence, Italy

Objective: Gorham-Stout Syndrome (GSD) is an extremely rare bone disease characterized by the onset and progressive osteolysis, especially in the upper part of the skeleton. The pathogenesis is still unknown and present therapies are only intended to limit the syndrome progression. Recently, the PI3K/AKT/mTOR signaling pathway and aberrations in the *ATG101* gene have been identified as potential molecular pathways involved in the GSD pathogenesis. Recently, it has been reported that the Endocannabinoid System (ES) could regulate the autophagy process. Therefore, in this study we investigated the possible involvement of ES and autophagy process in the pathogenesis of GSD.
Methods: First, we established and characterized two primaries cell lines, signed as BMSC-GS-1 and BMSC-GS-2, obtained from a healthy and pathological bone marrow bioptic samples from a GSD patient. After, we evaluated the ALP activity and hydroxyapatite deposition, through fluorimetric assay. Finally, we analyzed the expression levels of ES components and autophagy genes in the two cell lines both under normal conditions and during osteogenic differentiation, by using TaqMan technology.
Results: Both the cell lines show the mesenchymal phenotype. The spectrofluorimetric analyses revealed that BMSC-GS-2 line exhibit lower ALP enzyme activity and hydroxyapatite deposition than the BMSC-GS-1 line. The molecular analyses showed not only the presence of the ES components (i.e., *CNR1*, *CNR2*, and *NAPE-PLD*) in the BMSC-GS1 line, but also a positive modulation of them during the osteogenic differentiation process. Same results have been obtained regarding the expression levels of autophagy genes (i.e., MAPLC3B, BECN1, and ATG5) in both the BMSC-GS-1 and BMSC-GS-2 lines, during osteogenic differentiation.
Conclusion: This preliminary study showed for the first time whether and how ES and the autophagy may be involved in the GSD pathogenesis. To date we are evaluating the possible presence and modulation of ES components expression in BMSC-GS-2 cells during osteogenic differentiation. This will allow to identify new cellular targets that can be used for the development of targeted therapies, such as the ES that could pave the way to the development of therapies focusing on the isolation and use of natural molecules contained in therapeutic Cannabis. Further studies needed.

P314
USE OF PATIENT-REPORTED OUTCOME MEASURES AND PATIENT-REPORTED EXPERIENCE MEASURES WITHIN INTERVENTIONAL STUDIES AIMING AT THE MANAGEMENT OF SARCOPENIA: RESULTS FROM A SYSTEMATIC LITERATURE REVIEW

G. D. Doza[1], S. van Heden[1], F. Oliveira Felix[1], V. Singh[1], C. Beaudart[2]

[1]Dept. of Biomedical Sciences, Faculty of Medicine, Univ. of Namur, [2]Dept. of Biomedical Sciences, Clinical Pharmacology and Toxicology Research Unit, Namur Research Institute for Life Sciences (NARILIS), Faculty of Medicine, Univ. of Namur, Namur, Belgium

Objective: Sarcopenia, age-related muscle decline, affects the mobility and independence of elderly individuals. Its prevalence varies across populations, with severe consequences such as increased risk of falls, fractures, depression, and even mortality, ultimately reducing overall quality of life. Current interventions involve a multifaceted approach, including nutrition, exercise, and pharmacology. The global increase in life expectancy emphasizes the growing importance of sarcopenia as a public health challenge. Patient-reported outcome measures (PROMs) and Patient-reported experience measures (PREMs) provide crucial insights for evaluating intervention effectiveness. The aim of this review is to identify all sarcopenia-designed interventional studies that used a PROMS/PREMS as the primary or secondary outcome, identify the different PROMS/PREMS used within those studies and summarize the effects of sarcopenia-designed interventions on PROMS/PREMS of sarcopenic participants.
Methods: A systematic search of databases (Medline, EMBASE, Review- Cochrane Central of Register of Controlled Trials and PsychINFO (Via Ovid)) was conducted in September 2023. The review followed the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) statement, and the protocol was registered on the Open Science Framework (https://osf.io/zxgwm/). Risk of bias was measured using the Cochrane 2.0 risk of bias tool.
Results: The systematic review identified 17 RCTs as sarcopenia-designed interventional studies that used a PROM as primary or secondary outcome. PROMs were exclusively used in these studies (i.e., no PREMS were reported) and covered the assessment of various aspects, including quality of life (15/17, 88.2%) depressive symptoms (3/17, 17.6%) sleep quality/disturbance (2/17, 11.8%) and loneliness/social isolation, daytime sleepiness, insomnia impact (all reported in 1/17, 5.9%). Except of SarQoL, which is a specific health-related quality of life questionnaire for sarcopenia, all other PROMs identified were generic. Interventions included medication (11.8%), nutritional supplementation (35.3%), exercise Programs (23.5%) and a combination of exercise and nutritional supplements (29.41%). None of the included RCT contained any high risk of bias. The effect of sarcopenia-designated interventions on PROMs showed considerable heterogeneity.
Conclusion: heterogeneity in outcome measures underscores the need for standardization in sarcopenia research by developing a Core Outcome Set (COS). COS in sarcopenia studies would ensure consistent and comparable findings, ultimately enhancing the reliability and effectiveness of interventions.

P315
TOWARDS DEVELOPING A CORE OUTCOME SET (COS) FOR SARCOPENIA INTERVENTION STUDIES

S. van Heden[1], O. Bruyère[2], J.-Y. Reginster[2], M. Surquin[3], D. Sanchez-Rodriguez[3], C. Beaudart[1]

[1]Clinical Pharmacology and Toxicology Research Unit (URPC), NARILIS, Dept. of Biomedical Sciences, Faculty of Medicine, Univ. of Namur, Namur, [2]WHO Collaborating Center for Public Health Aspects of Musculo-Skeletal Health and Ageing, Division of Public Health, Epidemiology and Health Economics, Univ. of Liège, Liège, [3]Medicine Dept., Geriatrics Dept., Brugmann Univ. Hospital, Université Libre de Bruxelles, Brussels, Belgium

Objective: In recent years, there has been a significant surge in clinical research focused on sarcopenia, driven by its recognized reversibility. The interest in developing effective interventions is underscored by the need for well-defined outcomes, currently impeded by the absence of a standardized set of outcomes, known as Core Outcome Sets (COS). Utilizing COSs harmonizes assessment criteria, facilitating the comparative analysis of diverse interventions. Establishing a sarcopenia-specific COS is crucial to augment the precision and effectiveness of clinical trials in this field. This project aims to develop a COS for intervention studies in sarcopenia, designed to address unmet needs in sarcopenia research and clinical practice and to pave the way for the development of effective treatments for the disease.
Methods: The methodology for this study adheres to the recommendations outlined in COS-STAD and COS-STAP. The study protocol has been registered in the database of the COMET initiative (https://www.cometinitiative.org/Studies/Details/2991). A Working Group (WG) will be assembled to collaborate on this project, consisting of individuals with sarcopenia, clinicians, and researchers. Subsequently, the study will progress through three key phases. Firstly, the development of an outcome list will be pursued through two distinct methods: a systematic literature review following PRISMA guidelines and semi-structured interviews with 5 to 10 participants aged 65 years and older, diagnosed with sarcopenia. The literature review will comprehensively identify potential outcomes reported in phase III clinical trials on sarcopenia, while the interviews will delve into the values and preferences of the participants. Following the outcome list development, a two-round modified Delphi process will be initiated, engaging key stakeholders to identify and prioritize relevant outcomes. Finally, a consensus meeting involving the Working Group will be convened to validate the results.
Results: Ongoing project, results are not available yet.
Conclusion: A core outcome set of sarcopenia would improve the efficiency of research and allow direct and indirect comparisons of sarcopenia clinical trials. This protocol aims to define the scope and methodology, stakeholder involvement, procedures and consensus processes of the COS for sarcopenia intervention trials. Our ultimate goal is to improve the lives of people with sarcopenia.

P316
THE SOCIETAL COSTS AND HEALTH UTILITIES OF KNEE OSTEOARTHRITIS IN THE NETHERLANDS

Charlotte Beaudart[1−2], Annelies Boonen[3−4], Tim A E J Boymans[5], Pieter J Emans[5], Mickael Hiligsmann[6]

[1]Department of Biomedical Sciences, Clinical Pharmacology and Toxicology Research Unit, Namur Research Institute for Life Sciences (NARILIS), Faculty of Medicine, University of Namur, Namur, Belgium, [2]WHO Collaborating Centre for Public Health Aspects of Musculo-Skeletal Health and Ageing, Division of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium, [3]Department of Internal Medicine, Division of

Rheumatology, Maastricht University Medical Centre, Maastricht, Netherlands, [4]Care and Public Health Research Institute (CAPHRI), Maastricht University, Maastricht, Netherlands, [5]Department of Rheumatology, Maastricht University Medical Center, Maastricht, The Netherlands, [6]Department of Health Services Research, Care and Public Health Research Institute (CAPHRI), Maastricht University, Maastricht, The Netherlands

Objective: To estimate the average annualized healthcare costs, societal costs and health utilities associated with knee osteoarthritis using data from the Maastricht Study (DMS).
Methods: The twelve-month costs per patient and health utilities related to knee osteoarthritis for the year 2022 were measured utilizing data from the DMS, an observational, prospective, population-based cohort developed in the South of the Netherlands, with an overrepresentation of individuals with diabetes. Participants who completed the baseline assessment of the DMS and for whom all relevant variables for these analyses were collected were included. The identification of knee osteoarthritis was based on the clinical criteria developed by the American College of Rheumatology (ACR). Costs were assessed throughout a resource-use questionnaire, completed by participants. Cost prices were based on Dutch costing guidelines. Healthcare costs, non-healthcare costs, total societal costs and health utilities (measured by EQ5D) were compared between patients with knee osteoarthritis and those without. Analyses were adjusted on age, gender (female), educational level (high) and presence of type II diabetes (yes).
Results: 7928 individuals were included in our analyses (50.6% of women, mean age of 59.4 years, 20% of people with type II diabetes) of whom 970 (i.e. 12.2%) were identified with knee osteoarthritis. Patients with knee osteoarthritis were more often of female gender, older and with lower educational levels compared to patients without knee osteoarthritis. Moreover, they had a higher prevalence of diabetes (i.e. 29.1%) compared to those without knee OA (i.e.18.8%). Globally, the presence of osteoarthritis was significantly associated with higher use of general practitioners, medical specialists and paramedics as well as higher paid home care and informal care received and higher productivity losses (all p-values < 0.05 both in univariate and multivariate models). This resulted into significantly higher annual societal costs per patient for patient with knee osteoarthritis (i.e. €4747.4 (95% CI 3736.4; 5985.4)) compared to those without knee OA (i.e. €2633 (95% CI 2345.6; 2942.6), $p < 0.001$)). Lower utility values were found for patients with knee osteoarthritis (i.e. 0.83 (95% CI 0.82; 0.84)) compared to those without knee osteoarthritis (i.e. 0.92 (95% CI 0.91; 0.92), $p < 0.001$). When stratifying the population based on the presence of type II diabetes, knee osteoarthritis remains associated with higher costs and lower health utilities, even among patients suffering solely from knee osteoarthritis without diabetes.
Conclusions: These findings emphasize the substantial economic and health burden associated with osteoarthritis.

P317
LESSONS FROM RICO: RISK COMMUNICATION IN OSTEOPOROSIS STUDY

C. Beaudart[1], M. Sharma[2], S. Silverman[3], M. Hiligsmann[4]

[1]Clinical Pharmacology and Toxicology Research Unit (URPC), NARILIS, Dept. of Biomedical Sciences, Faculty of Medicine, Univ. of Namur, Namur, Belgium, [2]The OMC Research Center, Beverly Hills, USA, [3]Cedars-Sinai Medical Center, UCLA, Los Angeles, USA, [4]Dept. of Health Services Research, Care and Public Health Research Institute (CAPHRI), Maastricht Univ., Maastricht, Netherlands

Objective: There is a close and strong relationship between the quality of fracture risk communication and the initiation of osteoporosis treatment and adherence. RICO was a global study, run in 2022, involving 332 participants at risk of fracture aiming to improve fracture risk communication and to understand patients' willingness to initiate treatment based on their perception of fracture risk.
Methods: Semi-structured interviews were conducted in 11 centres, 9 countries around the world (UK, Belgium, the Netherlands, Spain, Japan, Canada—Hamilton and Montreal, Argentina, Mexico, USA—Los Angeles and Spokane). The participants' Fracture Risk Decision Point (FRDP) was established as the fracture risk at which a participant was willing to initiate therapy. For that, participants were shown 8 distinct scenarios—each with a hypothetical FRAX score and a standard 40% fracture risk reduction upon use of a medication with minor, transient side effects. In each scenario, participants were asked whether they would hypothetically agree to initiate the medication.
Results: The major finding of RICO study was that participants expressed a strong willingness to receive communication about their fracture risk. Globally, they preferred visual to numeric presentations of FRAX data. Among the format presented, colored stoplight was preferred to icon array. Median FRDP was below the national treatment threshold in all eight countries which use FRAX®-based treatment thresholds in a clinical setting. Moreover, 75.7% of all participants demonstrated FRDP below their respective treatment threshold. Patients who demonstrated higher levels of numeric literacy also showed a significantly higher median FRDP (i.e. 10%) compared to those with a lower level of numeric literacy (i.e. FRDP of 5%, $p < 0.001$). FRDP was not influenced by age or history of fracture. Among participants who agreed to initiate medication with an hypothetical 40% of fracture risk or less, a weak and negative correlation was found between FRDP and age ($r = -0.153$, $p = 0.007$).
Conclusion: Fracture risk communication with FRAX may be improved with visual presentation and use of both 2- and 10-year time frame. The RICO team is currently developing a fracture risk communication tool.

P318
A MULTIMODAL APPROACH TO AMELIORATE ACUTE PHASE REACTION INDUCED BY ZOLEDRONIC ACID

C. Chen[1], L. Kang[2], S. Lin[1], T. Lee[1], C. Ho[1]

[1]Kaohsiung Medical Univ., [2]National Cheng Kung Univ. Hospital, Kaohsiung, Taiwan

Objective: Zoledronic acid is an effective medication for anti-osteoporosis. However, acute phase reaction (APR) following zoledronic acid infusion is a problematic issue that hinders the drug adherences. To overcome this, a case–control retrospective study was conducted to validate the effectiveness of our novel protocol, which consist of glucocorticoids, NSAIDs and acetaminophen, on APR prevention.
Methods: This case–control retrospective study was conducted to validate the effectiveness of our novel protocols of multimodal anti-APR approaches for APR alleviation induced by zoledronic acid. The protocol includes intravenous glucocorticoid before zoledronic acid and oral glucocorticoid and NSAID for 3 d.
Results: There were 467 patients in the protocol group and 407 patients in the control group. There is no significant difference in the incidence of APR. After administration of protocol, 66 (14.13%) patients who experienced APR had their symptoms controlled completely, while 21 (4.49%) patients had their symptoms partially relieved. There were only 12 (2.57%) patients had their APR symptoms persisted after administration of the prevention protocol. Overall, 434 out of 467 patients (92.93%) are free from symptoms of

APR in the protocol group; while 339 out of 407 patients (83.29%) are free from symptoms of APR in the control group.
Conclusion: A multimodal anti-APR approaches of glucocorticoids, NSAIDs, and acetaminophen can effectively prevent and control zoledronic acid-induced APR.

P319
BONE PROTECTION IN A FRACTURED WORLD: A CLOSED LOOP AUDIT OF BONE PROTECTION PRESCRIPTION POST HIP FRACTURE AT DISCHARGE AND 12 MONTHS ON IN A MODEL FOUR HOSPITAL IN THE WEST OF IRELAND

C. Conlon[1], M. S. Memon[1], C. Small[1], R. Waters[1]

[1]Univ. Hospital Galway, Galway, Ireland

Objective: To assess practice of prescribing of bone protective treatment in a post hip fracture patient cohort at the time of discharge and at one year post discharge.
Methods: A closed loop audit in the form of a retrospective review of prescribing of bone protective medications post hip fracture was undertaken in a model four hospital in the west of Ireland. The Plan-Do-Study-Act tool was utilised to guide this audit, the standard being audited against was the fifth Irish Hip Fracture Standard. Each cycle of the audit looked at a one month period namely August 2021 and subsequently August 2022 with a follow up at one year to assess adherence. The inclusion criteria being aged sixty-five or above with a hip fracture within the time period of the study, those with fracture of shaft of femur were excluded. The data was analysed using Microsoft Excel and ethical approval was obtained in advance.
Results: There were 32 patients in the first cycle of the audit and 18 patients in the second cycle. The majority of the cohort in the first and second cycle were female, 23(74%) and 16(89%), with a mean age of 81 years. The first cycle demonstrated that 21(65%) were prescribed bone protective treatment with 8(31%) on treatment one year post hip fracture. The second cycle demonstrated that 9(50%) were initiated on bone protection on discharge with 7(78%) on treatment at the one year juncture.
Conclusion: This timely audit demonstrates suboptimal adherence to the Irish Hip Fracture Standards and will serve as the impetus for redesigning our orthogeriatric service with an emphasis on education of staff and ensuring prescription of bone protective medications at the time of discharge. Notably the second cycle demonstrates that whilst prescription of bone protection has disimproved adherence for those prescribed these agents has in fact improved since the first cycle. The results of this audit will drive change in the orthogeriatric service.

P320
COMPARATIVE EFFECTS OF ROMOSOZUMAB VERSUS TERIPARATIDE IN POSTMENOPAUSAL WOMEN WITH INTERTROCHANTERIC FRACTURE AFTER SURGERY: A RETROSPECTIVE SINGLE CENTER ONE-YEAR STUDY

C. Coppola[1], A. Randazzo[2], S. Balzano[3], D. Agnusdei[4]

[1]Dept of Orthopedics & Traumatology, Trauma Center-Ospedale del Mare, General Hospital, ASL NA1 Center, Italian NHS, Naples, [2]Dept of Rehabilitation Medicine-Ospedale del Mare, General Hospital, ASL NA1 Center, Italian NHS, Naples, [3]Dept. of Economics & Law, Univ. of Cassino (FR), Cassino, [4]Indipendent Scientific Consultant, Siena, Italy

Objective: In the elderly, the occurrence of a proximal femur fracture is a serious event, charged with a 20–33% of mortality risk within 1–2 years after surgery; furthermore, within one year from the event, there is an increased risk (up to 55%) for a further fragility fracture. In order to prevent this fracture cascade, international scientific societies and health authorities guidelines suggest to start bone anabolic therapy immediately after surgery. Romosozumab (ROMO) is a monoclonal antibody that inhibits Sclerostin (anabolic effect) and increases RANKL expression (antiresorptive effect), thus increasing bone mass. Teriparatide (TPTD), a N-terminal rhPTH peptide, was the first anabolic agent, approved since 2003 for the treatment of severe Osteoporosis. The aim of the present study is to compare the effects 12 months of these two treatments in osteoporotic women with intertrochanteric fractures, on BMD and other functional parameters.
Methods: The study was performed from January 2023 for 12 months at the Trauma Center of "Ospedale del Mare" in Naples. Sixty postmenopausal women, age (67–83), were selected to enter the study; other inclusion criteria were: BMI 23–26, BMD T-score between -2.5 and -4, ASA score 2, and AO31 A2-A3 femoral fracture type fixed by nail. The study population was divided into two groups: 30 patients were treated with ROMO 210 mg/month sc, and 30 patients with TPTD 20 mcg/day, respectively. BMD, by DXA, was measured after surgery, and at the end of treatment period; functional parameters, such as Timed Up and Go (TUG) test, SF-36 Health Status Questionnaire and Self-reported Hip Pain, by modified Harris Pain score, were measured at 3, 6, and 12 months of treatment.
Results: In the ROMO group, compared to baseline, BMD increased by 11.2% at the lumbar spine (LS), 3% at the total hip (TH), and 3.1% at the femoral neck (FN). In the TPTD group BMD increased by 6% at LS, and a decrease of 0.5%, and 0.2% at TH and FN, respectively. In the ROMO group, the TUG test showed a reduction between 15 to 30 s after 3, 6 and 12 months of treatment compared with the TPTD group. Self-reported hip pain, measured by the modified Harris Hip pain score, significant improved ($P < 0.0001$), as well as the SF-36 questionnaire ($P = 0.003$), expression of the Health-related QoL. During the treatment period, in both groups there were no drug related side effects.
Conclusion: This is the first study to show a clinical and functional comparison in osteoporotic patients, after hip surgery, of two anabolic treatment, ROMO and TPTD. The results clearly show that both drugs are safe and effective in the secondary prevention of further fractures; in particular, the ROMO group showed a significant increase in BMD, and a significant functional recovery, compared with TPTD group. In these specific population, based on our results, ROMO should be then considered as first choice treatment, in order to get stronger metabolic and functional outcomes.

P321
HEALTH-RELATED QUALITY OF LIFE IN SARCOPENIA: CONTENT VALIDITY OF THE SARQOL QUESTIONNAIRE

C. Demonceau[1], B. Voz[2], O. Bruyère[1], J.-Y. Reginster[1], C. Beaudart[3]

[1]WHO Collaborating Centre for Public Health Aspects of Musculo-Skeletal Health and Ageing, Division of Public Health, Epidemiology and Health Economics, Univ. of Liège, Liège, [2]Dept. of Public Health, Univ. of Liège, Liège, [3]Clinical Pharmacology and Toxicology Research Unit, NAmur Research Institute for LIfe Sciences (NARILIS), Dept. of Biomedical Sciences, Faculty of Medicine, Univ. of Namur, Namur, Belgium

Objective: To enhance the evidence supporting the content validity for the Sarcopenia & Quality of Life (SarQoL) questionnaire, a patient-reported outcome measure specifically designed for assess health-related quality of life in individuals with sarcopenia.
Methods: Individual semi-structured interviews targeting the impact of sarcopenia on quality of life were conducted with 17 older Belgian older adults (i.e., aged 65 years and older) who met the EWGSOP2

criteria for the diagnosis of sarcopenia. Afterwards, structured cognitive interviews were conducted to rate the relevance of the current format of SarQoL. Transcripts were qualitatively analysed thematically according to the seven dimensions of the SarQoL questionnaire (i.e., physical and mental health, locomotion, body composition, functionality, activities of daily living, leisure activities and fears).

Results: The majority of the concepts elicited during the semi-structured interviews fit within existing SarQoL dimensions. Importantly, the seven dimensions of SarQoL were consensually considered as relevant by the participants. Some new emergent concepts were identified. While many of them (i.e. fear of the future, need of assistance with particular activities of daily living) could be considered as enrichments of existing dimensions or sub-concepts, other new concepts may highlight two potential dimensions not covered by SarQoL (i.e. self-realization and the adaptation/use of strategies). Cognitive interviews also highlighted that SarQoL items and instructions were clear and comprehensible.

Conclusion: SarQoL, in its current form, demonstrates good evidence of content validity for assessing health-related quality of life in patients with sarcopenia. To ensure SarQoL remains applicable across various individuals with sarcopenia, it is crucial to strike a balance between minimizing patient burden and considering the relevance of new elements. Taking this into account, we do not recommend adding new items or dimensions to SarQoL. Instead, we suggest improving the assessment of quality of life by concurrently incorporating additional validated scales. This would be beneficial for researchers or clinicians who aim to address dimensions such as self-realization and the utilization of adaptive strategies when evaluating the quality of life in a specific targeted sarcopenic population.

P322
HISTOLOGICAL, CLINICAL AND INSTRUMENTAL EVALUATION OF SARCOPENIA IN OSTEOARTHRITIC PATIENTS

C. Greggi[1], M. Montanaro[1], A. Chiavoghilefu[2], S. Gino Grillo[2], C. Prezioso[2], A. Mauriello[1], R. Iundusi[1], E. Gasbarra[1], U. Tarantino[1]

[1]Univ. of Rome "Tor Vergata", [2]Policlinico Tor Vergata, Rome, Italy

Objective: Among the major aging-related diseases of the musculoskeletal system are osteoarthritis and osteoporosis. Very often, these two conditions may be accompanied by a concomitant progressive and generalized loss of skeletal muscle mass and strength, known as sarcopenia. Therefore, the purpose of the present study was to investigate muscle quality and function in osteoarthritic patients, to identify any differences from patients also suffering from osteoporosis or osteopenia.

Methods: Patients undergoing prosthetic hip replacement surgery affected by osteoarthritis (OA) and patients affected also by osteoporosis or osteopenia (OA/OP/Ope) were enrolled. The Harris Hip Score (HHS) was calculated to assess joint function degree, and the standard diagnostic procedure for sarcopenia was then followed. Muscle quality in terms of contraction velocity was also assessed by tensiomyographic examination, and finally, histomorphometric examination, and immunohistochemical analysis (IHC) for identification of type II muscle fibers were performed.

Results: HHS was lower in the OA/OP/Ope patients' group. Evaluation of sarcopenia by performing the 30'' chair stand test and the Timed Up and Go Test (TUG) showed lower muscle strength in the same group of patients. Similarly, performance of the Short Physical Performance Battery (SPPB) showed a lower level of muscle performance in the OA/OP/Ope group than in the OA patients. Tensiomyographic analysis revealed that the muscle contraction capacity of OA/OP/Ope patients was lower than that of the OA group. Confirming these findings, histological analysis showed that the muscle tissue of this group of patients was characterized by reduced-diameter muscle fibers, a larger amount of adipose tissue and larger inter-fiber spaces. In addition, the percentage of type II fibers was lower in the OA/OP/Ope group than in the OA patients.

Conclusion: In OA patients, the concomitant osteoporotic condition worsens the degree of hip joint function and muscle qualitative and functional status. In addition, the tensiomyograph proves to be a potential and valuable new instrumental strategy for the diagnosis of sarcopenia, since in a noninvasive modality, it appears to confirm the finding obtained by invasive modality on muscle biopsy.

P323
RELATION BETWEEN ADIPONECTIN LEVELS AND BONE LOSS IN ANOREXIA NERVOSA: A PROSPECTIVE STUDY

C. Guillot[1], C. Philippoteaux[1], O. Ghali[2], J. Vignau[3], C. Chaveau[2], B. Cortet[1]

[1]Univ. of Lille/Rheumatology/Salengro Hospital/Lille Univ. Hospital, Lille, [2]Univ. of Littoral Cote d'opale/Research/Salengro Hospital/Lille Univ. Hospital, Boulogne, [3]Univ. of Lille/Psychiatry/Fontan Hospital/Lille Univ. Hospital, Lille, France

Bone loss in anorexia nervosa is a complex phenomenon with only partial understanding of its underlying mechanisms. Recent studies suggested the involvement of bone marrow adiposity and adipokines, such as adiponectin, in bone involvement.

To explore the potential relationship between adiponectin levels and bone parameters, we conducted a prospective observational study in a cohort of anorexic patients at the Lille University Hospital (France) from September 2013 to December 2016. The study involved three stages: V0 (inclusion), V1 (midpoint at 1 or 2 years post-inclusion), and V2 (end of follow-up at 5 or 6 years). At each stage, BMD measurements, biological tests (including total and high molecular weight (HMW) adiponectin), and clinical assessments were performed.

A total of 184, 91, and 55 patients were evaluated at V0, V1, and V2, respectively. The mean age at enrollment was 23 years, with an average disease duration of 5 years. Amenorrhea was present in 72.3% of patients. Mean BMI was 16.8 kg/m^2 at V0, 17.8 kg/m^2 at V1, and 18.2 kg/m^2 at V2. Osteoporosis prevalence in BMD was 70/184 patients (n = 38%), 38/91 patients (n = 41.8%), and 38/55 patients (n = 40%) at V0, V1, and V2, respectively, with a predominant involvement of the femoral neck. For all patients, BMD at the total hip decreased significantly from V0 to V2 (-0.009 ± 0.008 g/cm^2 to 1.05%, $p < 0.0001$), whereas BMD at the lumbar spine increased significantly (0.043 ± 0.010 g/cm^2 or + 4.92%). Adiponectin data were collected for 106, 66, and 51 patients at V0, V1, and V2, respectively. No significant differences in adiponectin levels were observed between V0, V1 and V2. Moreover, adiponectin level was independent of bone status. In multivariate analysis, at baseline, several factors were associated with osteoporosis at the lumbar spine including BMI (p = 0.02), bone alkaline phosphatase level (p = 0. 01) and adiponectin level (total and HMW (p = 0.01). At the total hip site, duration of amenorrhea (p = 0.03), BAP level (p = 0.02) and adiponectin level total and HMW (p = 0.02) were found.

Extended follow-up demonstrated bone loss at the total hip in anorexic patients, despite weight gain. Factors associated with these findings included adiponectin levels (total and HMW), suggesting the need for further research to elucidate the role of adiponectin in anorexia nervosa related bone loss.

P324
FROM ATHENS TO LONDON: THE 15-YEAR HISTORY OF IOF ANTHEM POWERED BY JOHAN SEBASTIAN BACH

C. Günther[1]

[1]Orthopädische Fachklinik, Dept. Osteology, Schwarzach, Germany

Objective: In order to increase public awareness and knowledge about the osteoporosis, novel measures are necessary. I use the "ESCEO-IOF Song" for many years in the fight against osteoporosis. On its fifteenth anniversary, I would like to put a spot on my experiences with it.

Methods: 1. In front of the J.S. Bach memorial in Leipzig I had an idea on October 25, 1992, which I shortly presented in a one minute presentation at the Osteoporosis World Congress 1993 in Hong Kong and named it "J.S. Bach Rule of Osteoporosis Prevention". 2. At the World Osteoporosis Day on October 20, 2007, I presented an "IOF-Osteoporosis-Song" in a German version in Bad Füssing, Germany, which was using the IOF topics of the World Osteoporosis Days from 2004–2008. These topics were converted into lyrics and music, arranged by Gert Fischer (Leipzig) and musically accompanied by the brass ensemble of the world famous "Leipziger Gewandhausorchester".

Results: After agreement of the "Neue Bach-Gesellschaft Leipzig (NBG)" and the choirmaster of the "Leipziger Thomanerchor" Prof. Georg Christoph Biller (September 20, 1955–January 27, 2022) I used the "Bach Rule" in over 1900 osteoporosis lectures. The NBG published this rule for its 3800 members worldwide. In a pilot survey of 350 listeners to this osteoporosis lecture, 349 (99%) liked this "Bach Rule". The German version of IOF-Song 2007 has been published in the magazine "Mobiles Leben" (4/2007) of the "Kuratorium Knochengesundheit", a former member of the IOF. The song was also presented at the 2nd International Educational Symposium in Bratislava/Slovakia on September 30, 2008 and the English version had its world premiere at ECCEO 9 in Athens, Greece on March 18, 2009. The song was also translated into Chinese at the 18th International Osteoporosis Symposium in Beijing/China at April 17, 2010. And we produced a CD "IOF-Song—Fighting Against Osteoporosis". Ten years later, I reported on the Ten Years Of Experience In Fighting Osteoporosis With the ESCEO-IOF-Song Powered By Johann Sebastian Bach at the poster session of the WCO-IOF ESCEO on April 6, 2019 in Paris, and was then invited by Prof. Kanis to the opening ceremony of the WCO in Barcelona in 2020 and in Berlin in 2021, both of which fell victim to COVID-19.Ultimately, I was supposed to perform the "ESCEO-IOF song" at the IOF board meeting on May 4, 2023 at the WCO IOF-ESCEO in Barcelona as "IOF Anthem", but this was prevented by a rib fracture that I suffered in the immediate run-up to the congress. Meanwhile I used the "ESCEO-IOF-Song against Osteoporosis" in the last fifteen years since 18th March 2009 in over 200 lectures with a total of more than 50 000 listeners, and it is a great honor and pleasure for me to finally be able to perform the IOF Anthem at the opening ceremony of the WCO IOF-ESCEO 2024 on April 11, 2024 at 6:55 p.m. at the Hilton London Metropole—accompanied by playback by the "Brass ensemble of the Leipzig Gewandhaus Orchestra" under the direction of Karl-Heinz Georgi.

Conclusion: 1. The "J.S. Bach Rule for Osteoporosis Prevention" has proved itself in almost two thousand lectures and therefore, hopefully increased the public awareness of the disease. 2. The German version of the "IOF-song 2007" shows a very good acceptance, and many osteoporosis support groups have asked for the text and tune, using it for education and raising public awareness. 3. The English version of the "ESCEO-IOF-Song against Osteoporosis" at ECCEO 9 in Athens—incl. the CD—experienced a good acceptance and was published on the website of IOF and ESCEO (see: Google: ESCEO—IOF Song Part 2). 4. Last but not least I hope, that the "Bach-Rule of Osteoporosis Prevention" and the "IOF Anthem" can also remember my honoured surgical colleagues from all over the world: "Don´t forget the prevention of osteoporosis!" 5. "Music is a greater revelation than all wisdom and philosophy," says Ludwig van Beethoven!

P325
THE LIGNANS METABOLITES, ENTEROLACTONE AND ENTERODIOL, MAY PREVENT OSTEOPOROSIS AND OSTEOCLAST DIFFERENTIATION BY AKT SIGNAL PATHWAY

C. H. Hou[1], P. C. Chen[2]

[1]Dept. of Orthopedic Surgery, National Taiwan Univ. Hospital, [2]School of Life Science, National Taiwan Normal Univ., Taipei City, Taiwan

Objective: Bone remodeling is a physiological process crucial for maintaining bone health, ensuring calcium balance, and strengthening bones. It involves three main cell types: osteoclasts, osteoblasts, and osteocytes. Osteoporosis increases the risk of fractures, raises mortality rates, reduces quality of life, and leads to increased healthcare costs. Current treatment strategies primarily focus on inhibiting osteoclast activity, such as bisphosphonates and hormone replacement therapy/selective estrogen receptor modulators (SERMs), but these methods have potential risks. Lignans, a type of phytoestrogen, mimic estrogen's effects and have a certain degree of bone-protective properties. Upon ingestion in the human digestive system, lignans are metabolized by gut microbiota, leading to the formation of two significant byproducts known as enterodiol (END) and enterolactone (ENL). However, the actual effect of these metabolites on bone loss prevention remains unclear.

Methods: The cell cytotoxicity of END and ENL was evaluated by alamar blue cell viability assay. The osteoclasts precursor cells RAW264.7 were stimulated with RANKL (50 ng/mL) to induce osteoclastogenesis, with the addition of different concentrations of END and ENL (0–100 μM). The signal pathway involved in the effects of END and ENL on osteoclastogenesis was assessed by western blot.

Results: Our preliminary findings indicate that END and ENL possess the ability to inhibit osteoclast differentiation, suggesting their potential in treating osteoporosis. Additionally, our observations reveal that when administered simultaneously, END and ENL significantly suppress Akt signaling pathways compared to the MAPK pathway during osteoclast differentiation.

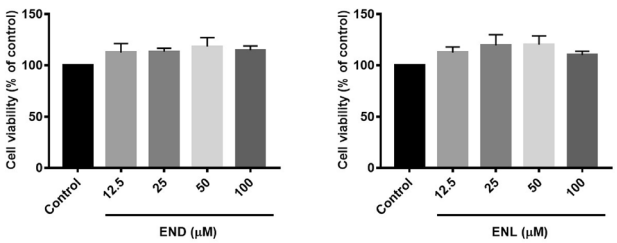


Figure 1. The cell viability of END and ENL on RAW264.7.

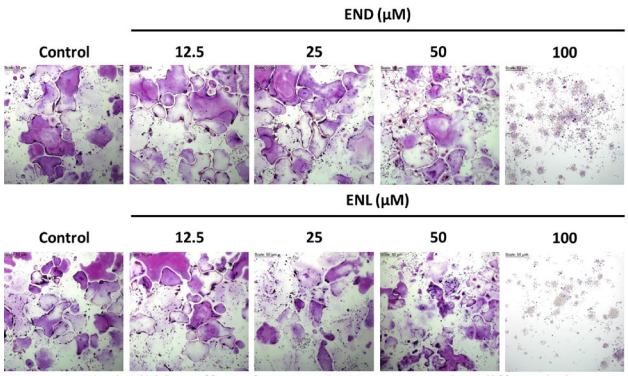


Figure 2. The inhibition effect of END and ENL on osteoclast differentiation.

Conclusion: This research project is dedicated to unraveling the underlying molecular mechanisms responsible for the inhibitory effects of END and ENL on osteoclast differentiation, suggesting its potential application on osteoporosis therapy.

P326
OSTEOPENIA: MORE ROUTES TO INCREASE BONE FRAGILITY?

C. Horvath[1], E. Csupor[2], E. Hosszu[3], T. Leel-Össy[1], S. Meszaros[1]

[1]Dept. of Internal Medicine & Oncology, Semmelweis Univ., [2]Budavar Health Center, [3]2nd Dept. of Pediatrics, Semmelweis Univ., Budapest, Hungary

BMD derived T-score below -2.5 is considered as diagnostic threshold for osteoporosis. However, former publications issued that 40% of fragility fractures occur in patients with osteopenia (T-score between -1 and -2.5). Adequate treatment is barely available for osteopenic patients, as -2.5 or lower T-score is required to initiate therapy, although antiresorptive drug treatment has been proven efficient in osteopenia as well.

Our trial included 2028 osteopenic women (66.8 ± 10.3 y) suggested to bone densitometry. History of fragility fractures was recorded (n = 787). DXA scans were performed (GE Lunar Prodigy, WI, USA) and BMD (g/cm^2) was assessed at the L1-L4 vertebrae, hip and radius. At least one of the three sites needed to result in osteopenia while patients with T-score below − 2.5 at any site were excluded. The 10-year probability of hip and major osteoporotic fractures was calculated by the traditional FRAX tool. In the fractured patients the FRAX calculation was repeated with disregarding the previous fracture as a risk factor.

The incidence of at least one fragility fracture was 34% in the total group. No differences in age, BMI, BMD and T-score has been found between the fractured and non-fractured patients. Both hip and major osteoporotic fracture probability were higher in the fractured subgroup (MOP 13.9 vs. 7.3%, $p < 0.001$; FRAX-HIP 4.8 vs. 2.2%, $p < 0.001$) than in non-fractured participants. FRAX calculated without previous fracture in the fractured subgroup remained still higher than that of non-fractured persons (MOP 9.4%, $p < 0.001$ and HIP: 3.3%, $p < 0.004$).

Considering the scale of osteopenia from − 1.0 to − 2.5, FRAX-HIP and FRAX-MOP increased in the non-fractured patients. In fractured patients the facture incidence was growing with extent of osteopenia from 29 to 45%, however, the fracture probabilities remained stable in all level of osteopenia, calculated even with minding or ignoring the previous fracture as risk factor.

We hypothesize that osteopenic condition may contain not only lower bone mass but other non-mass deteriorations of bone, resulting in excess fragility.

P327
IMPACT OF A SECONDARY PREVENTION PROGRAM FOR FRAGILITY FRACTURES AT THE ORTHOGERIATRIC CLINICAL CARE CENTER AT THE FUNDACIÓN SANTA FE DE BOGOTÁ, 2014–2020

C. M. Olarte[1], A. M. López[2], J. Tihanyi Feldman[1], A. Libos Zabala[1], D. Morales[2], A. Patiño[2], R. Pesantez[1], J. Salavarrieta[1], V. Sanint[2]

[1]Orthopaedics, Hospital Universitario Fundación Santa Fe de Bogotá, [2]Geriatrics, Hospital Universitario Fundación Santa Fe de Bogotá, Bogotá, Colombia

Objective: To characterize the secondary prevention program for fragility hip fractures in patients older than 65 years, determine adherence to treatment and its effect on the appearance of new fractures in the established follow-up period.
Methods: A descriptive retrospective cohort study was carried out. Patients older than 65 y with a fragility hip fracture treated by an Orthogeriatric Clinical Care Center between May 2014 and April 2020 who completed a one-year follow-up were included.
Results: A final sample of 290 patients was obtained (226 women and 64 men) with an average age of 82.27 y. It was found that 84.5% of patients received indications to start osteoporotic management prior to hospital discharge and only 35.2% started the treatment in the first 6 postoperative months. 16.6% (n = 48) of patients presented a new fracture, with no significant difference between those who started their osteoporosis treatment in a timely manner. Out of the 48 patients, 5 patients (10.4%) met therapeutic failure criteria.
Conclusion: Most patients (84.5%) received indications for starting osteoporotic treatment before hospital discharge, nevertheless 35.2% started it during the first 6 postoperative months. 16.6% of patients presented a new fracture during follow up, of which only five met therapeutic failure criteria. No significant differences were found between the presence of new fractures and early initiation of osteoporotic management. However, literature shows that prompt and timely osteoporotic treatment reduces the incidence of new fractures, thus measures must be implemented to strengthen the adherence and surveillance of patients to the indicated treatment.

P328
VITAMIN D STATUS AND OSTEOPOROSIS IN PORTUGUESE PATIENTS WITH INFLAMMATORY BOWEL DISEASE: ASSOCIATION WITH CLINICAL FEATURES

C. Marques Gomes[1], M. Diz Lopes[1], I. Santos[2], B. M. Fernandes[1], F. Magro[3], M. Bernardes[1], L. Costa[1]

[1]Rheumatology Dept., Centro Hospitalar Universitário de São João, Porto, [2]Rheumatology Unit, Centro Hospitalar Tondela-Viseu, Viseu, [3]Gastroenterology Dept., Centro Hospitalar Universitário de São João, Porto, Portugal

Objective: To assess the prevalence of vitamin D deficiency in a Portuguese cohort of patients with inflammatory bowel disease (IBD). To evaluate the association of demographic, clinical and analytical features with vitamin D serum levels and differences between patients with and without osteoporosis (OP).
Methods: Monocentric retrospective study. All patients included had IBD. Demographic, clinical and analytical data were collected at the time of the first visit in the Rheumatology department (V1). Correlations between continuous variables were evaluated by Spearman rank test and Pearson's correlation coefficient; Mann–Whitney U and T-student tests were used in the comparison analysis between groups.
Results: 244 patients were included, mostly female (57.4%), with a mean age at V1 of 46.65 (± 13.46) y. 184 (75.4%) patients had

Crohn's disease (CD) and 60 (24.6%) had ulcerative colitis (UC). 41 patients (16.8%) had osteoporosis (T score ≤ -2.5 or Z-score ≤ -2.0 in DXA, according to age ≥ 40 or < 40 y, respectively) and 10 (4.1%) had previous fragility fractures. 192 (78.7%) patients exhibited low levels of 25-hydroxyvitamin D (25(HO)VitD (< 30 ng/mL), 17 (6.9%) were taking calcium and/or vitamin D supplements. Of all the parameters evaluated, serum levels of 25(HO)VitD correlated positively with hemoglobin (Hb; $r = 0.151$, $p = 0.023$) and total calcium ($r = 0.135$, $p = 0.045$) and negatively with erythrocyte sedimentation rate (ESR; $r = -0.232$, $p < 0.001$). Among patients with osteoporosis, serum levels of 25(HO)VitD were lower ($p = 0.008$) compared to non-osteoporotic patients; except for age at V1, BMI and osteocalcin, no other statistically significant differences were observed (Table 1).

Table 1. Features related to vitamin D serum levels and osteoporosis (by DXA)

	25-HOVitD (ng/mL)	Osteoporosis (T-score ≤ 2.5 or Z-score ≤ 2.0)*		
		Yes (n=41)	No (n=194)	
Age at V1 - mean±SD	*r=-0.420; p=0.529*	48.73±14.75	42.78±12.84	***p=0.035***
BMI - mean±SD	*r=-0.136; p=0.590*	23.81±4.32	25.93±4.57	***p=0.008***
Duration of IBD - median (IQR)	*r=-0.850; p=0.201*	12.00 (14.00)	9.50 (9.30)	*p=0.104*
Hemoglobin - median (IQR)	***r=0.151; p=0.023***	14.00 (2.10)	14.00 (2.30)	*p=0.461*
Total proteins - mean±SD	*r=0.350; p=0.626*	72.00±5.48	73.28±5.33	*p=0.199*
Albumin - median (IQR)	*r=0.121; p=0.710*	41.70 (4.30)	42.80 (4.50)	*p=0.122*
Beta-CTX - median (IQR)	*r=-0.120; p=0.079*	0.38 (0.26)	0.36 (0.27)	*p=0.135*
Osteocalcin - median (IQR)	*r=-0.850; p=0.217*	23.20 (15.80)	19.00 (11.60)	***p=0.030***
Total calcium - median (IQR)	***r=0.135; p=0.045***	4.70 (0.30)	4.70 (0.20)	*p=0.730*
CRP - median (IQR)	*r=-0.119; p=0.073*	3.30 (7.20)	2.50 (5.30)	*p=0.303*
ESR - median (IQR)	***r=-0.232; p<0.001***	16.00 (29.00)	14.50 (19.00)	*p=0.132*
Ferritin - median (IQR)	*r=-0.30; p=0.671*	153.75 (240.30)	85.00 (130.80)	*p=0.061*
25-HVitD (ng/mL) - median (IQR)	---	15.00 (13.00)	19.00 (13.00)	***p=0.008***
25-HVitD deficency - n (%)	---	---	---	*p=0.054*
≤ 30 ng/mL (n=189)	---	38 (92.7)	151 (77.8)	---
> 30 ng/mL (n=36)	---	2 (4.9)	34 (17.5)	---
Sex, median - n (%)	---	---	---	*p=0.863*
Female	---	23 (56.1)	112 (57.7)	---
Male	---	18 (43.9)	82 (42.3)	---
Under VitD supplements – (n=15, %)	---	3 (7.3)	11 (5.7)	*p=0.842*

Footnote: Beta-CTX: beta-carboxy-terminal type-1 collagen crosslinks; BMI: body mass index; CRP – C reactive protein; DXA: Dual-energy X-ray absorptiometry; ESR: erythrocyte sedimentation rate; 25(HO)VitD: 25-hydroxy vitamin D; IBD: inflammatory bowel disease; IQR: interquartile range; SD: standard deviation; V1: first visit at rheumatology department; *considering age at V1 (≥40 or <40 years old, respectively)

Conclusion: Lower total body mineral density has been found in patients with IBD which may increase OP and pathological bone fractures risk due to several mechanisms. This study reveals higher prevalence of OP in comparison with the general Portuguese population and an association of OP with vitamin D deficiency across patients with IBD. On the other hand, our results show significant correlations between clinical/analytical variables and vitamin D levels: positive correlation of 25(HO)VitD with Hb and negative correlation with ESR, suggesting a potential link to inflammatory state.

P329
FRACTURE RISK ASSESSMENT BASED ON FRAX® ALGORITHM IN PORTUGUESE PATIENTS WITH INFLAMMATORY BOWEL DISEASE: ASSOCIATION WITH CLINICAL FEATURES

C. Marques Gomes[1], M. Diz Lopes[1], I. Santos[2], B. M. Fernandes[1], F. Magro[3], M. Bernardes[1], L. Costa[1]

[1]Rheumatology Dept., Centro Hospitalar Universitário de São João, Porto, [2]Rheumatology Unit, Centro Hospitalar Tondela-Viseu, Viseu [3]Gastroenterology Dept., Centro Hospitalar Universitário de São João, Porto, Portugal

Objective: To assess the prevalence of osteoporosis and proportion of treated patients in an IBD cohort. To evaluate the association of demographic, clinical and analytical features with fracture risk.

Methods: Monocentric retrospective study. All patients included had IBD. Demographic, clinical and analytical data and BMD by DXA (total hip, femoral neck and lumbar spine) were collected at the time of the first visit in the Rheumatology outpatient center (V1); for patients over 40 years old, major (MFR) and hip (HFR) fracture risk was assessed (based on FRAX-Portugal); proportion of patients with indication of therapy for OP was calculated (according to Portuguese recommendations). Correlations between continuous variables were evaluated by Spearman rank test and Pearson's correlation coefficient and Mann–Whitney U test was used in the comparison analysis between groups.

Results: 244 patients were included, mostly female (57.4%), with a mean age at V1 of 46.65 (± 13.46) y; 184 (75.4%) patients had Crohn's disease and 60 (24.6%) had ulcerative colitis. Regarding IBD treatment, 12 patients (4.9%) were taking glucocorticoids at V1 and 185 (75.8%) had been previously treated with glucocorticoids. Of all patients, 33 (14.1%) had DXA T-score ≤ -2.5 (osteoporosis), 10 (4.1%) had previous fragility fractures. Concerning to individuals ≥ 40 years old (Table 1), serum levels of total proteins and albumin correlated negatively with HFR ($r = -0.194$, $p = 0.035$) and MFR ($r = -0.187$, $p = 0.026$), respectively. Erythrocyte sedimentation rate (ESR) correlated positively with MFR ($r = 0.175$; $p = 0.045$), ferritin correlated positively with MFR ($r = 0.214$; $p = 0.017$) and HFR ($r = 0.206$; $p = 0.022$); β-CTX correlated positively with MFR ($r = 0.221$; $p = 0.010$). Of interest, serum levels of 25(HO)VitD correlated negatively with β-CTX ($r = -0.255$; $p = 0.004$). Fifteen patients (10.1%) had an indication for osteoporosis treatment (no differences between genders, $p = 0.848$); only 3 were undergoing treatment with bisphosphonates.

Table 1. Patients ≥ 40 years old (n=148): features related to major and hip fracture risk assessed by FRAX®Port.

	Major fracture risk (%)	Hip fracture risk (%)
Age at V1	**r=0.593; p<0.001**	**r=0.439; p<0.001**
BMI	**r=-0.212; p=0.010**	**r=-0.317; p<0.001**
Age at IBD diagnosis	**r=0.271; p<0.001**	**r=0.180; p=0.030**
Hemoglobin	n.s.	n.s.
Total proteins	n.s	**r=-0.194; p=0.035**
Albumin	**r=-0.187; p=0.026**	n.s.
Beta-CTX	**r=0.221; p=0.010**	n.s.
Osteocalcin	**r=0.236; p=0.006**	n.s.
25(HO)VitD	n.s.	n.s.
CRP	n.s.	n.s.
ESR	**r=0.175; p=0.045**	n.s.
Ferritin	**r=0.214; p=0.017**	**r=0.206; p=0.022**
Calprotectin	n.s.	n.s.
Sex, median (IQR)	n.s.	n.s.
Female (n=90)	2.10 (2.30)	0.30 (0.90)
Male	1.95 (2.10)	0.35 (1.00)
Previous fracture, median (IQR)	**p<0.001**	**p<0.001**
Yes (n=10)	9.90 (10.70)	4.10 (9.10)
No	1.90 (1.90)	0.30 (0.80)
Exposition to GC, median (IQR)	**p=0.005**	n.s.
Yes (n=114)	2.20 (2.30)	0.35 (1.00)
No	1.30 (1.40)	0.20 (0.60)
IBD type	n.s.	n.s.

Conclusion: This study shows a higher prevalence of OP in comparison with the general Portuguese population and an important number of untreated patients with high FR. It also reveals significant associations between clinical variables and FR in IBD patients: inflammatory state (positive correlation of FR with ESR and ferritin) and nutritional status (albumin correlated negatively with FR).

P330
THE EFFECTS OF THE MOTOR CONTROL HOME ERGONOMICS ELDERLIES' PREVENTION OF FALLS (MCHEELP) PROGRAMME IN PATIENTS WITH SARCOPENIA: A PILOT STUDY

M. Tsekoura[1], C. Matzaroglou[1], S. Xergia[1], E. Tsepis[1], Y. Dionnysiotis[2], V. Sakellari[3], E. Billis[1]

[1]Dept. of Physiotherapy, Univ. of Patras, Rio, [2]Medical School, Univ. of Patras, Spinal Cord Injury Rehabilitation Clinic, Univ. General Hospital Patras, Rio, [3]Dept. of Physiotherapy, Univ. of Western Attica, Athens, Greece

Objective: The objective of this study was to investigate the effects of a three month 'Motor control Home ergonomics Elderlies' Prevention of falls' (McHeELP) programme on muscular, functional/physical performance and fear of falling across older adults with sarcopenia.
Methods: Patients with sarcopenia participated in the present study. The definition of sarcopenia was performed according to the criteria reported by EWGSOP2. The exercise programme included a package of exercises divided into 6 domains [1 (warm up) and 5 motor control domains]. In addition, all participants received a booklet, with basic advice and tips on modifying the interior and exterior of their home environment (kitchen, bedroom, living room, bathroom and stairs of the home). The pre- and post-intervention measurements were recorded while taking into account a series of tests and measurements which included in the hand grip strength, bioimpedance analysis, muscle mass, functionality and fear of falling.
Results: A total of 12 participants [men (n = 4) and women (n = 8)] with a mean age of 74.95(SD = 5) years completed the study. Results showed significant differences before and after the programme in terms of the participants' functionality ($p < 0.001$), balance ($p < 0.05$) and fear of falling ($p < 0.001$).
Conclusion: The present study revealed that the McHeELP programme has positive effects on functionality, balance and fear of falling which are essential components for falls prevention. Future studies need to be developed and implemented in order to improve clinical implications and reduce the burden of falls reduce the burden of falls in patients with sarcopenia.

P331
RELIABILITY OF A PHOTOGRAMMETRY TECHNIQUE USING THE LEONARDO ANALYSIS SYSTEM FOR THE EVALUATION OF THE ANGLE Q OF THE LOWER LIMB

E. Livieratou[1], G. Kokalidis[1], S. Lampropoulou[1], Z. Dimitriadis[1], C. Matzaroglou[1], K. Fousekis[1], E. Tsepis[1], M. Tsekoura[1]

[1]Dept. of Physiotherapy, Univ. of Patras, Rio, Greece

Objective: To investigate the reliability of the photogrammetry technique in the evaluation of lower limb Q angle using the Leonardo (postural lab) system.
Methods: Participants (aged 18 y and above) were recruited from the University of Patras. An assessment of test–retest and inter-rater reliability was conducted. The procedure included photography and static analysis on the Leonardo PL800 postural analysis system and evaluation of Q-angle by photogrammetry. Reliability was tested using the intraclass correlation coefficient (ICC) to examine the degree of correlation of values between the two measurements, the first completion and the repetitive completion of the instrument. The study protocol was approved by the Ethical Committee of the University of Patras, Greece.
Results: 59 adults (mean age of 21.2 ± 1.8 y) participated to assess the test–retest reliability and 29 adults (mean age of 20.8 ± 2 y) to assess inter-rater reliability. The reliability of repeated measures was excellent for the right leg (ICC 0.97 95% CI 0.95–0.98) and for the left leg (ICC 0.88 95% CI 0.79–0.92). Good inter-rater reliability was recorded for both the right leg (ICC 0.73 95% CI 0.51–0.85) and the left leg right (ICC 0.7 95% CI 0.6–0.85).
Conclusion: Photogrammetry demonstrated to be a reliable method using the Leonardo posture analysis system for the evaluation of lower limb Q angle. New research studies are needed to investigate both the reliability and validity of the system at other body sites.

P332
ULTRASOUND EVALUATION OF DIAPHRAGM IN HEALTHY ADULTS

I. Aravantinou[1], A. Skoura[1], C. Matzaroglou[1], E. Billis[1], M. Tsekoura[1]

[1]Dept. of Physiotherapy, Univ. of Patras, Rio, Greece

Objective: To evaluate the thickness of the diaphragm by ultrasound and correlate it with gender, anthropometric characteristics and physical activity level.
Methods: Diaphragmatic thickness assessment was performed in the Clinical Physical Therapy and Research Laboratory (CPR Lab) using 2D real-time ultrasound (Versana Active, General Electric). The measurement was performed in the diaphragm juxtaposition zone, in the right hemithorax in Brightness Mode (B-Mode), through the acoustic window of the liver, in the region of the 8th–10th intercostal space and between the anterior and mid axillary line, with the echosounder oriented parallel to the anteroposterior plane. All measurements were made in the supine position with the torso in 30°–40° reclination, knees bent at 70°–80° and arms bent behind the neck at (a) maximum diaphragmatic inhalation and (b) the corresponding maximum diaphragmatic exhalation. Thickness was defined as the ratio (Th at End Inspiration—Th at End Expiration)/(Th at End Expiration), where Th: diaphragm thickness. The procedure was repeated 3 times for each measurement and the mean value was kept. The research study was approved by the Ethics Committee of the University of Patras.
Results: 49 healthy adults older than 18 y (mean age 24.4 ± 7.8) and without respiratory disorders participated in this study. The majority of participants were female (n = 29; 59.2%), nonsmokers, with a mean BMI of 23.4 ± 2.7, and diaphragm thickness of 102.6 ± 36.8 mm. For females the thickness was 94.3 ± 35.3 mm and for males 108.4 ± 37.4 mm. The thickness at peak expiration recorded a moderate to high correlation with gender ($r = 0.42$, $P = 0.02$) and BMI ($r = 0.46$, $P < 0.01$). Diaphragm thickness as defined by (Th at End Inspiration—Th at End Expiration)/(Th at End Expiration) recorded moderate correlation with depth of inspiration ($r = 0.4$, $P < 0.001$) and expiration ($r = 0.4$, $P < 0.001$) but not with other parameters.
Conclusion: Diaphragm thickness is an important evaluation parameter for different population groups. In the present study no significant associations with gender, anthropometric characteristics were recorded. Future studies in a larger sample of participants are required to make correlations with more parameters.

P333
ENHANCED PAPER GRIP TEST: CLINICAL APPLICABILITY AMONG COMMUNITY DWELLING OLDER ADULTS

M. Tsekoura[1], P. Chatzistergos[2], E. Billis[1], C. Matzaroglou[1], N. Chockalingam[2], E. Tsepis[1]

[1]Dept. of Physiotherapy, Univ. of Patras, Rio, Greece, [2]Centre for Biomechanics and Rehabilitation Technologies, Staffordshire Univ., Stoke-on-Trent, UK

Objective: To investigate the clinical applicability of the enhanced paper grip test (EPGT) for assessing foot muscle strength in community dwelling older adults.
Methods: Community dwelling older adults > 60 years of age enrolled in this pilot study. After providing their informed consent, participants were interviewed to assess comorbidities, medication use, and history of falls. EPGT force was recorded for both feet using the same standardized protocol for all participants (1,2). Participants were seated comfortably without shoes and socks. The card was placed underneath the participant's foot. They were instructed to start gripping the card and then a highly experienced physiotherapist started pulling the dynamometer until the card was fully removed from underneath. The test was repeated three times per foot, and the highest value was recorded. Clinical applicability was assessed in community-dwelling adults of both genders. After the testing all participants answered 3 questions: (i) Do you have any complain; (ii) Did you find the procedure easy; (iii) Do you feel safe during the measurement? The study was approved by the Ethics Committee of the University of Patras.
Results: A convenience sample of 30 community-dwelling adults (70.6 ± 5.8 y) was recruited for clinical applicability testing. Most of the participants were women (n = 21; 70%) and without a self-reported history of falling (n = 4, 13.3%). The test and the data obtained was performed in < 5 min. All participants performed the test easily, safely and with no complaints. Mean score on EGPT was 16.1 ± 4.2 N.
Conclusion: EGPT is easy to use and it is a clinical applicable measurement of the strength of the hallux grip. Further research is required in a larger sample size of older adults with different pathologies.
References

1. Chatzistergos PE, et al. Gait Posture 2020;81:120
2. Tsekoura M, et al. Eur J Transl Myol 2023;33:11841

Acknowledgement: This paper has been financed by the funding programme "MEDICUS" of the University of Patras, Greece.

P334
REAL-TIME DIAGNOSTIC ULTRASOUND AS A MEANS OF BIOFEEDBACK TRAINING IN TRANSVERSUS ABDOMINUS RE-EDUCATION OF PATIENTS WITH NON-SPECIFIC LOW BACK PAIN

C. Matzaroglou[1], N. Taxiarchopoulos[1], M. Tsekoura[1], S. Lampropoulou[1], E. Billis[1], J. Gliatis[2]

[1]School of Health Rehabilitation Sciences, Dept. of Physiotherapy, Univ. of Patras, Patras, Greece, [2]Dept. of Orthopedic Surgery, Univ. Hospital of Patras, Patras, Greece

Objective: The ultrasound-guided imaging of activation/contraction of the deep abdominal muscles (such as transervsus abdominis) is useful for assisting deep muscle re-education, which is often dysfunctional in nonspecific low back pain (NSLBP). Thus, this pilot study aimed to evaluate the use of real-time ultrasound (US) as a feedback device for transverse abdominis (TrA) activation/contraction during an exercise program in chronic NSLBP patients.
Methods: 55 chronic NSLBP patients were recruited and randomly assigned to a US-guided (n = 30, 24 women, 48.4 ± 3.55 y) or control group (n = 25, 21 women, 47.8 ± 5.22 y). The same motor control-based exercise program was applied to both groups. All patients received physiotherapy twice per week for seven weeks. Outcome measures, tested at baseline and post-intervention, included Numeric Pain Rating Scale, TrA activation level (measured through a pressure biofeedback unit-based developed protocol), seven established motor control tests, Roland-Morris Disability Questionnaire and Hospital Anxiety and Depression Scale.
Results: For each group, all outcome variables yielded statistical differences post-intervention ($p < 0.05$), indicating significant improvements. However, there were no significant group x time interactions for any of the outcomes ($p > 0.05$), thus, indicating no superiority of the US-guided group over the control.
Conclusion: The addition of US as a visual feedback device for TrA re-education during a motor control exercise program was not proven superior to traditional physiotherapy.
References

1. Matzaroglou C, et al. Aging Clin Exp Res 2022;34;S352
2. Matzaroglou C, et al. Osteoporos Int 2021;32(Suppl1):S588

P335
GAIT IMPAIRMENT AND QUALITY OF LIFE IN PATIENTS WITH MULTIPLE SCLEROSIS IN WESTERN GREECE

E. Trachani[1], E. Diakatou[1], A. Mpouta[1], E. Tsiamaki[1], C. Matzaroglou[1], E. Chroni[1]

[1]Univ. of Patras, Patras, Greece

Objective: To clarify how the gait disorders in Multiple Sclerosis (MS) affect the quality of life in a sample of patients living in West Greece.
Methods: 38 patients with MS (mean age: 43.61 ± 10.75 y, 24 females) were evaluated by means of EDSS, Timed 25-Foot Walk (T25FW), MS Quality of Life-54 (MSQoL-54)[1] and MS Walking Scale-12(MSWS-12)[2].
Results: There was a moderate linear correlation between EDSS subgroups and the T25FW ($p = 0.013$, $r = 0.398$) and MSWS-12 ($p = 0.00$, $r = 0.544$). Moreover, a negative correlation was found between the T25FW and the MSQoL-54 (physical health: $r = -0.385$, mental health: $r = -0.368$). Finally, there was a positive correlation between the physical health composite of the MSQoL-54 and the mental health composite ($r = 0.458$).
Conclusion: Walking disorders in patients with MS in West Greece have a negative effect on their quality of life and also on their mental health, in accordance with the current literature[3–4].
References

1. Giordano A, et al. Health Qual Life Outcomes 2021;19:224
2. Marengo D, et al. Mult Scler Relat Disord 2019:36:101400
3. Koch WM, et al. Mult Scler 2022;28:1286
4. Sconza C, et al. Medicina (Kaunas) 2021;57:713

Acknowledgement: This paper has been financed by the funding program "MEDICUS" of the University of Patras, Greece.

P336
CROSS-CULTURAL ADAPTATION OF THE "NORTH STAR ASSESSMENT" SCALE FOR LIMB-GIRDLE MUSCULAR DYSTROPHY

S. Lampropoulou[1], A. A. Lala[1], M. M. Troullaki[1], V. M. Pratsinaki[1], I. A. Gedikoglou[2], C. Matzaroglou[1], E. Billis[1], E. Chroni[3]

[1]Physiotherapy Dept., Univ. of Patras, [2]Univ. of Patras, Dept. of Physiotherapy, [3]Unit of Neuromuscular Diseases, Patras Univ. General Hospital, Patras, Greece

Objective: The "North Star Assessment" scale (NSAD), is a newly developed, reliable tool for the evaluation of the functional deficits in patients with limb-girdle muscular dystrophy (LGMD) (1) but it hasn't yet been adapted into Greek. The aim therefore, of this research, was to translate and cross-culturally adapt the NSAD scale into the Greek language. A pilot test of the adapted scale was a second aim of this study.
Methods: Following permission by the developers of the scale (MJ), the NSAD was adapted according to international guidelines (forward & backward translation, by four independent translators) (2). The pre-final NSAD-GR was distributed to a convenient sample of 8 experienced physical therapists (range of 2–10 y of clinical experience with neurological patients) in order to assess the comprehension of the translated content and it was piloted in 2 patients with LGMD (1 male & 1 female, age of 31 and 41 y, respectively).
Results: Upon completion of the translation, the semi-final form of the Greek adaptation of the NSAD was revealed which has kept the structure, the form and the outline of the original English scale intact. The pilot study of the NSAD-GR, was an important step in clarifying a few commands of the translated version. Pre-final NSAD-GR was found to be adequate, comprehensible and easy to use by physical therapists and patients alike.
Conclusion: For validation of the final form of the NSAD scale into Greek, further research is recommended, with a larger sample of patients and domestic physiotherapists, for a thorough screening of its psychometric features.
References:

1. Jacobs MB, et al. Ann Neurol. 2021;89:967
2. Sousa VD, Rojjanasrirat W. J Eval Clin Pract 2011;17:268

Acknowledgments: Initially, we would like to that thank Dr Meredith James for the access to NSAD files and for giving us the permission for the adaptation of the scale into the Greek language. We would also like to thank Prof Elisabeth Chroni, the Director of the Neuromuscular Unit of the University Hospital of Patras, in Greece, who granted us the space of the unit that meets all the specifications for conducting our research.

P337
THE ROLE OF THE PHYSIOTHERAPIST AS A MEMBER OF THE MULTIDISCIPLINARY TEAM OF A MODEL CENTRE OF EXPERTISE IN RARE DISEASES

S. Lampropoulou[1], G. Andrikopoulou[1], E. Billis[1], C. Matzaroglou[1], E. Trachani[1], E. Chroni[2]

[1]Physiotherapy Dept., Univ. of Patras, [2]Unit of Neuromuscular Diseases, Patras Univ. General Hospital, Patras, Greece

Objective: Healthcare interdisciplinarity, powered by diverse scientific knowledge, is vital (1). Greece's sole rare neuromuscular diseases centre (NMDU) emphasizes interdisciplinary collaboration. The recent physiotherapist inclusion highlights their value, but research gaps persist on their team role. This study aims to investigate the physiotherapist's impact on patient care quality within the multidisciplinary team, of a model centre of expertise on rare diseases.
Methods: Fifteen staff members of the NMDU (8 women and 7 men, aged 44 $\pm$ 10 years old), participated in the survey. 33 patients of the Unit (16 women and 14 men, aged 51 $\pm$ 14 years old), also participated. The survey was firstly conducted by creating two questionnaires to assess the role of the physiotherapist and then distributing them to the staff and patients of the NMDU.
Results: The data collection showed that the physiotherapist has multiple roles within the NMDU, such as assessment (80%), and long-term follow-up of patients (86%). In addition, he/she participates in conducting research (54%), and has the theoretical background (67%), to provide motivation to patients (66%). The physiotherapist's presence in the NMDU is considered necessary (93%). In the future, the need for expanding the responsibilities of the physiotherapist, such as working with external physiotherapists (87%) and providing physiotherapy sessions in the NMDU (93%) is highlighted.
Conclusion: Physiotherapist's role in the NMDU is essential, blending theory, clinical expertise, interdisciplinary training and research skills, for quality patient's care. Future improvements would include extending the physiotherapist presence in the unit and sharing knowledge from research with the community.
Reference: (1) WHO (2010). "Framework for action on interprofessional education and collaborative practice".
Acknowledgements: We would like to thank Prof Elisabeth Chroni, the Director of the Neuromuscular Unit of the University Hospital of Patras, in Greece, who granted us the space of the unit that meets all the specifications for conducting our research.

P338
THE EFFECT OF A TELEREHABILITATION PROGRAMME ON BALANCE, GAIT AND PHYSICAL PERFORMANCE IN INDIVIDUALS WITH PARKINSON'S DISEASE

E. Brouma[1], C. S. Chatzivasilis[1], I. Papakosta[1], P. Papadopoulos[1], M. Nikolopoulou[1], E. Trachani[1], S. Xergia[1], S. Lampropoulou[1], C. Matzaroglou[1]

[1]Physiotherapy Dept., Univ. of Patras, Patras, Greece

Objective: Telerehabilitation for the management of motor dysfunctions in Parkinson's disease (PD) has gained considerable interest in recent years but it is limited by the use of not easily accessible devices for most patients.
Methods: A convenience sample of n = 6 patients with PD, consisting of 2 women and 4 men aged 64 $\pm$ 11 years was randomly divided into 2 equal groups, receiving a remote therapeutic exercise program twice a week for 8 weeks. The experimental group followed the program via video-conferencing with live guidance from the physiotherapist, whereas the control group performed a similar unsupervised program via a standard exercise booklet. Assessments were conducted at baseline, at the end of the 4 weeks intervention and one month later (follow-up). The main outcome measures were balance (Mini Balance Evaluation Systems Test, Activity-specific Balance Confidence Scale), gait (Functional Gait Assessment, Freezing of Gait Questionnaire) and physical performance (Short Physical Performance Battery). Secondary outcome measures were posture abnormalities such as the Total (TCC) and Upper Camptocormia Curve (UCC) and Drop Head (DHA) angles (PL0800 Leonardo, Chinesport Italy), quality of life (Parkinson's Disease Quality of Life Questionnaire) and intrinsic motivation (Intrinsic Motivation Inventory).
Results: Balance and physical performance was improved in both groups after the end of the intervention, but the change was not statistically significant ($p > 0.05$). Significant improvement in freezing of gait was observed only in the intervention group ($p < 0.05$).

Quality of life and interest/enjoyment in activity also improved in both groups ($p \leq 0.05$), with no statistically significant difference between groups ($p > 0.05$). TCC and DHA angles decreased in both groups but not statistically significant ($p > 0.05$). Functional gait did not improve in either group ($p > 0.05$).

Conclusion: Remote rehabilitation through videoconferencing and via booklet seems to have a positive effect on balance, physical performance, quality of life, intrinsic motivation for exercise, TCC and DHA in patients with PD. However, studies with a larger sample size are needed to strengthen the results of this study.

Acknowledgment: This paper has been financed by the "MEDICUS" funding program of the University of Patras, Greece.

P339
ADHERENCE OF PATIENTS WITH PARKINSON' S DISEASE TO A NOVEL REMOTE REHABILITATION PROGRAM

S. Lampropoulou[1], C. S. Chatzivasilis[1], E. Brouma[1], I. Papakosta[1], P. Papadopoulos[1], M. Tsekoura[1], C. Matzaroglou[1], E. Trachani[1]

[1]Physiotherapy Dept., Univ. of Patras, Patras, Greece

Objective: Chronic neurological patients suffer from decreased motivation and exercise adherence over time (1). The aim of this study was to evaluate patients' adherence to a novel remote home exercise program guided by an exercise booklet (2).

Methods: In this single-blinded clinical trial, patients with Parkinson's disease were voluntarily enrolled in a remote hourly intervention, twice a week, for 8 weeks, which consisted of therapeutic exercises to improve posture, balance and gait. The exercises were delivered through a leaflet which was explained and given to the patients at their initial visit in the lab for the baseline assessments. Adherence was evaluated with the Exercise Adherence Rating Scale (EARS) as the main measurement outcome, while the motivation was also reported through the Intrinsic Motivation Index (IMI), the balance through the mini-Balance Evaluation Systems Test (mini-BESTest), the gait with the Functional Gait Assessment (FGA) and the freezing effect during gait with the Freezing of Gait Questionnaire (FOG-Q). Assessments were conducted pre- and post the intervention and one month after the completion of the program.

Results: Three patients (2 men and 1 woman, age 68 ± 6 y) diagnosed with Parkinson's Disease for 17 ± 11 months participated in this study. The patients' adherence to the intervention presented a steady but not statistically significant improvement up to the completion of the intervention ($p > 0.05$) (Fig. 1). According to patient reports, the freezing of gait had a statistically significant decrease ($p = 0.05$), while the other outcome measures despite the trend of improvement, did not present a significant differentiation ($p > 0.05$).

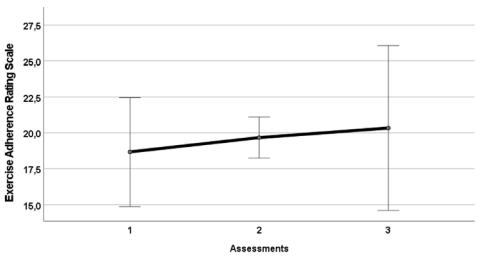


Figure 1. Improvement of the adherence of the patients in a remote rehabilitation program, delivered with an exercise leaflet. The assessments were performed 1: before the intervention (baseline), 2: at the end of the intervention and 3: one month after the end of the intervention (follow up) (n=3).

Conclusion: The trends of improvement in adherence, gait and balance combined with the intrinsic motivation suggest that an exercise program on a regular basis, even remotely, could be extremely beneficial for patients' functionality. Further research on the field of remote rehabilitation on chronic neurological patients using larger samples, is considered necessary.

References:

1. Mittaz Hager, AG et al. BMC Geriatrics 2019;19:13
2. Li R, et al. Clin Rehab 2021;35:1089

Acknowledgment: This paper has been financed by the "MEDICUS" funding program of the University of Patras, Greece.

P340
POSTURAL CONTROL AND LOWER LIMB FUNCTIONALITY IN PATIENTS WITH MULTIPLE SCLEROSIS AFTER A PILATES REHABILITATION PROGRAM COMPARED TO A CONVENTIONAL PHYSIOTHERAPY PROGRAM

S. Lampropoulou[1], D. N. Provata[1], I. Papakosta[1], E. Brouma[1], P. Papadopoulos[1], K. M. Kravvariti[1], C. Matzaroglou[1], E. Trachani[1]

[1]Physiotherapy Dept., Univ. of Patras, Patras, Greece

Objective: The Pilates method although effective in improving muscle recruitment, symmetrical body posture, breathing control, strengthening the abdominal muscles, it is not fully investigated whether it can help with lower extremity functionality and balance problems in multiple sclerosis (MS). The aim therefore, of this study is to investigate whether the Pilates method, compared to conventional physiotherapy, is more effective in improving postural control and lower limb functionality in patients with MS.

Methods: Patients with MS were randomly divided into two groups, undertaking a Pilates intervention program or a conventional physiotherapy program. Both programs were delivered in hourly-sessions, for 2 times/week, for 8 weeks. Assessments were conducted before the intervention (baseline), at the midpoint of the intervention (4 weeks) and 8 weeks after its completion (follow-up). The lower limb functionality was also assessed via the Fugl-Meyer Sensorimotor Assessment (FMA) scale. The balance was assessed via the mini Balance Evaluation System Test (mini-BESTest), the ability of walking in various conditions was assessed with the Functional Gait Assessment (FGA). Other secondary outcome measures included the assessment of fatigue with the Fatigue Severity Scale (FSS), the fear of falling with the Fall Efficacy Scale-International (FES-I) and the patients' quality of life with the Short Form Health Survey (SF-12).

Results: Eight patients with MS participated in the study (3 men, 5 women, mean age 46 ± 10 y), and were equally divided into the two groups. Lower limb balance and functionality improved after the intervention and showed significant progress in both groups between assessments ($p < 0.05$). Similarly, gait as well as the lower limb motor function were significantly improved for both groups ($p < 0.05$). Fatigue was reduced and quality of life was optimized ($p < 0.05$). No significant differences were found between the two groups ($p > 0.05$).

Conclusion: The beneficial effect of Pilates appears to be significant in improving the main deficits of patients with MS, but was not found to be superior to conventional physiotherapy. Further research is needed to confirm these results.

P341
FUNCTIONAL RETRAINING OF ADULT PATIENTS WITH FACIOSCAPULOHUMERAL MUSCULAR DYSTROPHY: A PILOT CLINICAL STUDY

M. Nikolopoulou[1], K. M. Kravvariti[1], C. Matzaroglou[1], E. Billis[1], E. Chroni[2], S. Lampropoulou[1]

[1]Physiotherapy Dept., Univ. of Patras, [2]Unit of Neuromuscular Diseases, Patras Univ. General Hospital, Patras, Greece

Objective: Facioscapulohumeral muscular dystrophy (FSHD) is an inherited condition within the spectrum of neuromuscular disorders, which is characterized by weakness and atrophy of the muscles in face, upper extremities, the pelvic girdle and trunk. There are significant research gaps regarding the effectiveness of the therapeutic exercise protocols (1,2). Therefore, this research aims to investigate the effectiveness of a functional retraining program in those patients.
Methods: This study constitutes a pilot clinical trial, involving pre- and post-intervention assessments in adults with FSHD. The intervention involved ten 45-min sessions, once a week, for 10 weeks and included muscle strengthening exercises, balance enhancement, selective muscle activation, walking and hand dexterity improvement (Fig. 1). The intervention's effectiveness was evaluated through the Revised Upper Limb Module (RULM), the 6-min walk test (6MWT), the expanded Hammersmith Functional Motor Scale (HFMSE), the muscle power in shoulder, hip, hand and ankle muscles as well as the active Range of Motion (ROM) in shoulder and ankle joints.

Figure 1. Examples of strengthening, fine mobility and dual task exercises.

Results: Four adults (3 men and 1 woman, 38 ± 9 years old), with FSHD participated in the study. The mean total distance walked during the 6MWT was increased by 17 ± 12 m ($p > 0.05$) (Fig. 2). The active ROM of shoulder's flexion and abduction increased in both sides, with a range of 27–40°. Additionally, the ankle flexion increased 3° in both sides. The strength improved mainly in shoulder's muscles for about 1 level at the Oxford scale (from 2 + to 3 +). No changes yielded in the muscles' power of hip, ankle and hand. The overall functional motor ability and hand dexterity improved but did not reach any significant change post the intervention ($p > 0.05$).

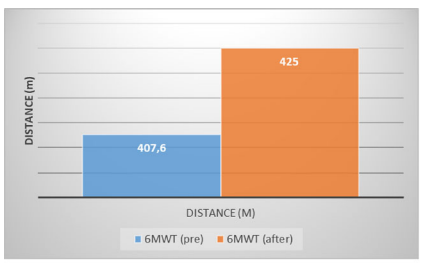


Figure 2. The graph shows the average distance walked by the 3 ambulatory patients at the initial and final assessment, using the 6MWT.

Conclusion: Due to small sample none of the outcomes reached significance, however, the improvements revealed in muscle power, active ROM, walked distance, body functional ability and hand dexterity, support the importance of a functional exercise intervention in these patients. A bigger sample and dose of the program during the week, may lead to more prominent improvements.
References:

1. O'Dowd DN, et al. Disabil Rehabil 2022;44:5950
2. Bostock EM, et al. Front Neurol 2019;10:1216

Acknowledgement: We would like to thank Prof Elisabeth Chroni, the Director of the Neuromuscular Unit of the University Hospital of Patras, in Greece, who granted us the space of the unit that meets all the specifications for conducting our research.

P342
A REVIEW ON KINETIC AND KINEMATIC CHANGES IN GAIT OF PATIENTS WITH PARKINSON'S DISEASE

S. Lampropoulou[1], N. Menegakis[1], S. I. Spyrou[1], C. Matzaroglou[1], E. Trachani[1], T. Bania[1]

[1]Physiotherapy Dept., Univ. of Patras, Patras, Greece

Objective: To investigate the gait alterations in Parkinson's disease patients through motor and kinematic analysis and to examine whether there is a correlation with the assessment through scales.
Methods: The scientific articles used to conduct this review were selected through authoritative databases, PubMed, Google Scholar, Medline, Scopus, Cochrane. A selective search was done for recent articles, from 2011 onwards for better validity and reliability of the information.
Results: The Vertical Ground Reaction Force has been reported to be changed particularly with the disease progression, where the waveform tends to become flat. Both flexion moments in all joints and power production were found to be increased, whereas the administration of medication did not seem to affect these factors in particular (1). Regarding the kinematic analysis, each joint is studied separately, as well as the spatiotemporal factors. In general, both the upper and lower limbs and the trunk showed a reduced range of motion trajectory and a position of excessive flexion and reduced extension predominated. In addition, reduced oscillation and asymmetries between the sides have been found in the upper limbs, especially at an early stage (2). Through the study of spatiotemporal factors it has been reported that the mean gait velocity and rate have decreased as well as a significant decrease was found in the variable in the swing phase. On the contrary, there was an increase in the support phase. At an advanced stage, these factors change even more markedly. The above kinetic and kinematic changes have been found to correlate with the bradykinesia as this is usually assed by the Unified Parkinson' s Disease of Rating Scale (UPDRS) III scale and the motor characteristics of movement performance speed, amplitude and rhythm (3). These correlations are not absolute as the resulting data are semi-quantitative and their results are non-linear showing high variability, which needs further study to clarify.
Conclusion: Kinetic and kinematic changes have been extensively studies in Parkinson's Disease. However, little is known about their correlations with the functional ability of these patients. Further research in associating these changes with the functional assessment scales would be of great value.
References:

1. Eltoukhy M, et al. Med Eng Phys 2017;50:75
2. Munoz Ospina B, et al. J Parkinsons Dis 2018;8:563
3. Wu Z, et al. Digit Health 2023;9:20552076231176653

P343
INTELLIGENT APPROACHES ENHANCE THE CLINICAL VALUE OF ELECTROPHYSIOLOGICAL MEASUREMENTS FOR SPINAL INJURY PROGRESSION PREDICTION

C. Matzaroglou[1], D. Chrysanthakopoulou[2], C. Koutsojannis[2], E. Trachani[1], M. Adamidou[2]

[1]School of Health Rehabilitation Sciences, Dept. of Physiotherapy, Univ. of Patras, [2]Health Physics & Computational Intelligence Laboratory, Physiotherapy Dept., School of Health Rehabilitation Sciences, Univ. of Patras, Patras, Greece

Objective: Spinal cord injury (SCI) is a severe condition caused by damage or trauma to the spinal cord. SCIs can result in a range of symptoms, including paralysis, loss of sensation, and loss of bowel and bladder control [1]. Over the years, various assessment scales have been developed to help healthcare professionals diagnose and monitor SCIs, assess the severity of the injury, and develop effective treatment plans, as these types of injuries vary to a great extent [2]. The rehabilitation and recovery of individuals with spinal cord injuries are usually complex and require collaboration among several healthcare professionals, aiming to improve the function and quality of life [3]. The purpose of this review is to provide a comprehensive guide of all the SCI's assessment tools, including their purpose, scoring system, and limitations. Moreover, it highlights the integration and importance of electrophysiology as far as the information it can reveal and the potential to revolutionize the diagnosis, prognosis, and treatment of spinal cord injuries using artificial intelligence approaches.
Methods: For this review article, a comprehensive search was conducted in the period from 01/12/2022 until 30/7/2023, on published medical literature using several electronic databases including Medline, Google Scholar, Science Direct, Sci-Hub, and PubMed. The research used keywords such as spinal cord injuries, spinal cord injury scales, evaluating tools for spinal cord injuries, somatosensory evoked potentials, electrophysiology in spinal cord injuries, artificial intelligence, and machine learning in SCI.
Results: This study resulted in a comprehensive guide of all the SCI's assessment tools, including their purpose, scoring system, and limitations. Some scales describe the type and the spinal level of the damage but do not assess the functional abilities, such as Frankel Scale and ASIA Impairment Scale, while others are focused on assessing daily life activities but are missing data about movement quality, like Functional Independence Measure Scale and Spinal Cord Independence Measure Scale. Also, some scales are more suitable for incomplete SCIs, like Lower Extremities Motor Score, Walking Index for Spinal Cord Injury Score, and Barthel Scale, while others are focused on evaluating the muscle tone – Ashworth Scale. Studies using somatosensory evoked potentials (SSEPs) have made steady progress since Dawson's initial description. The introduction of information technology has allowed for digital analysis, leading to the rapid scaling of SSEP and other Central Nervous System studies in the clinical field. Recent research has highlighted the multifaceted utility of SSEPs in understanding and managing neurological conditions. SSEPs offer objective and continuous monitoring, complementing subjective behavioral assessments, and hold promise in standardizing injury progression in research settings. Furthermore, SSEPs provide valuable insights in rodent models, facilitating comparisons between distinct SCI pathophysiology and monitoring motor function alterations post-injury. In clinical trials, standardized reporting guidelines for electrophysiological outcome measures are deemed necessary, while tailored SSEP assessments hold the potential to enhance SCI diagnosis, patient categorization, and therapeutic evaluation. Additionally, SSEPs offer insights into spinal cord reperfusion injury monitoring and aid in diagnosing focal spinal diseases. These findings collectively underscore SSEPs' pivotal role in advancing both research and clinical practices in neurological disorders and SCI management. Based on reliable data, this research concludes that with the assistance of Artificial Intelligence in the analysis of electrophysiological measures and somatosensory evoked potentials, Biomarkers and Bio-signals from neurophysiological indicators will eventually lead to the use of a unified tool model that will provide a personalized prediction of the restoration outcome of individuals with spinal cord injury, combined with imaging methods.
Conclusion: Therefore, it is of great importance to widely develop intelligent tools that will predict the walking ability and autonomy of a patient with SCI, i.e., a model predicting the progress of rehabilitation based on artificial intelligence for analyzing, somatosensory evoked potentials and biomarkers due to the valuable information they can offer in established clinical and imaging examinations. In that way, the diagnosis and prognosis of each patient will not be based on linear models that may not fully estimate data and do not consider the complex behavior of variables that often exist in biological conditions, especially in the case of spinal cord injuries where the variety of injuries is limitless. It is important to set correct parameters, as creating such a valuable AI tool which can maximize the importance of electrophysiology and somatosensory evoked potentials data in collaboration with other useful tests and tools already existing. To give this tool a greater extent, it is crucial to build it with information not only from the existing damage of a SCI or information from just hospitalization and recovery periods but also data from the progression of the condition. The follow-up should last forever after a spinal cord trauma, and the data should be collected annually to strengthen its importance.
References:

1. Nas K., et al. World J Orthop 2015;6:8
2. Kirshblum SC, et al. J Spinal Cord Med 2011;34:535
3. Behrman AL, et al. Phys Med Rehabil Clin N Am 2007;18:183

P344
VITAMIN D DEFICIENCY IN ORTHOPEDIC PATIENTS IN DIFFERENT LATITUDES. COMPARING GERMAN AND GREEK POPULATIONS

A. Mamilos[1], G. Maier[2], Z. Alsofy[3], P. Drees[4], K. Kafchitsas[5], J. Gliatis[6], C. Matzaroglou[6]

[1]Institute of Pathology, Univ. of Regensburg, Regensburg, Germany, [2]Pius-Hospital, Univ. Hospital of Orthopaedic Surgery, Carl-Von-Ossietzky-Univ., Oldenburg, Germany, [3]Dept. of Neurosurgery, St. Barbara-Hospital, Academic Hospital of Westfälische Wilhelms-Univ. Münster, Hamm, Germany, [4]Dept. for Orthopaedic Surgery, Univ. Hospital Mainz, Univ. of Mainz, Mainz, Germany, [5]Dept. of Spine Surgery, Asklepios Orthopedic Clinic Lindenlohe, Schwandorf, Germany, [6]Dept. of Physiotherapy, School of Health Rehabilitation Sciences, Univ. of Patras and Dept. of Orthopedic Surgery Univ. Hospital of Patras, Patras, Greece

Objective: Lack of vitamin D can cause bone demineralization, bone mass loss and secondary hyperparathyroidism, bone fractures, and osteoporosis [1]. The preventive role of vitamin D is not evidently proven for the case of fractures [2, 3], but vitamin D plays a crucial role in the development and maintenance of a healthy skeleton throughout life [4]. Vitamin D regulates skeletal homeostasis [5] and the immune system [6]. Hypovitaminosis D increases the risk of respiratory and periprosthetic infections, whereas vitamin D supplementation may reduce the risk of influenza or an infection [7, 8]. Although data is currently not sufficient, there are studies, including a randomized clinical pilot study, that suggest a prophylactic potential of vitamin D for COVID-19 patients [9]. Hypovitaminosis D can

increase the risk of cardiovascular diseases, type 2 diabetes, and mental illness. Vitamin D plays a pivotal role in calcium metabolism and bone mineralization. Sufficient vitamin D levels are important for the health and functionality of the musculoskeletal system. Hypovitaminosis D is a phenomenon affecting orthopedic patients worldwide.

Methods: This study researched whether most orthopedic patients in two different cities of different countries had hypovitaminosis D, whether there was a correlation between sunshine hours and vitamin D serum levels, and whether hours of sunshine alone were enough to achieve vitamin D sufficiency among orthopedic patients regardless of their activities. In total, 500 patients in Greece and 500 patients in Germany, admitted to orthopedic surgery departments of 2 hospitals, were analyzed regarding their 25-OH-D serum levels between 1 January 2013 and 31 December 2013. The tested population was set to electively undergo an orthopedic operation. The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of the University of Patras (protocol code 4052 and date of 13 March 2017). In Regensburg and Patras, upon admission, all patients signed to grant consent that their personal, medical, and laboratory data may be retrospectively anonymously analyzed for further studies. Blood was extracted on the day of admission for elective surgery, regardless of the kind of elective operation (no fasting serum). The mean age of the patients was 59 years old. Age was categorized into 4 groups (30 years and younger, 31–50 years old, 51–69 years old, and 70 years and older).

Results: The mean sunshine hours throughout the year were also calculated. Both the German and Greek groups showed hypovitaminosis D. Older patients were more affected. Although there were more hours of sunshine in Greece, Greek orthopedic patients also showed hypovitaminosis D. Hypovitaminosis D affects orthopedic patients independent of their latitude. As shown in other studies, there is a wide prevalence of vitamin D deficiency among the world's population; Hernigou et al. describe vitamin D deficiency as a common phenomenon. In our study, a high percentage of the population in both Germany and Greece, without consideration of their medical history, showed hypovitaminosis D. More than 50% of the tested patients showed not only a 25-OH-D insufficiency but also a deficiency. The lowest values of 25-OH-D in serum were among the patients aged 70 years or more. As shown above, 25-OH-D values increased during the summer months, in which the most sunshine hours were measured. The correlation between sunshine hours and 25-OHD seems to be stronger in the Greek population. The strong correlation in the German population seems to be due to the low status in winter rather than the peak in summer. However, the patients still did not achieve scores of 25-OH-D above 30 ng/mL.

Conclusion: Supplementation of vitamin D may be considered among orthopedic patients to achieve sufficient levels in serum. Sufficient vitamin D levels may be helpful for the treatment of orthopedic patients, reduce the negative effects of operations or postoperational settings.

References:

1. Maier GS, et al. Orthop Relat Res 2013;471:3029
2. Grossman DC, et al. JAMA 2018;319:1592
3. Zhao J-G, et al. JAMA 2017;318:2466
4. Wacker M, Holick MF. Nutrients 2013;5:111
5. Goltzman D. Cell Biol 2018;149:305
6. Medrano M, et al. J Mol Sci 2018;19:2663
7. Zhu Z, et al. Nutr 2021;8:
8. Grant WB, et al. Nutrients 2020;12:988
9. Entrenas Castillo M, et al. Steroid Biochem Mol Biol 2020;203:105,751

P345

EFFECT OF THERAPEUTIC EXERCISE PROTOCOL, ON PAIN AND FUNCTION IN PATIENTS WITH LUMBAR DISC DISEASE WITH CLINICAL LOW BACK PAIN AND/OR SCIATICA

C. Matzaroglou[1], A. Evangelatou[2], E. Billis[2], M. Tsekoura[2], E. Trachani[2], S. Lampropoulou[2], M. Adamidou[3], C. Koutsojannis[3], J. Gliatis[4]

[1]Dept. of Physiotherapy, School of Health Rehabilitation Sciences, and Unit of Neuromuscular Diseases Univ. Hospital of Patras, [2]School of Health Rehabilitation Sciences, Dept. of Physiotherapy, Univ. of Patras, [3]Health Physics & Computational Intelligence Laboratory, Physiotherapy Dept., School of Health Rehabilitation Sciences, Univ. of Patras, [4]Dept. of Orthopedic Surgery, Univ. Hospital of Patras, Patras, Greece

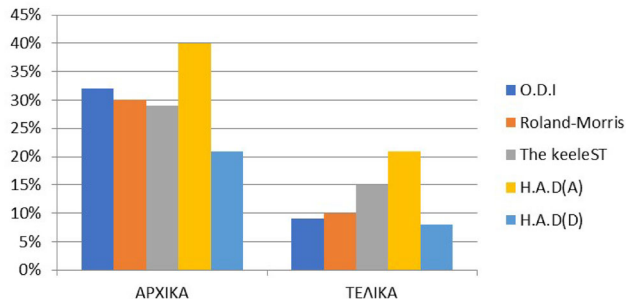
Objective: Chronic low back pain is a common cause of disability and has considerable medical, social, and economic implications. An estimated 80% of the population suffers an episode of low back pain at some time in their lives and 5–10% of patients develop persistent back symptoms, while there are potentially many sources of low back pain including the spinal facet and sacroiliac joints) the intervertebral disc is one of the most common. A variety of methods have been used to treat low back pain of unspecified etiology, however, research [1,2,3] seems to focus on the association of a condition such as lumbar disc herniation with the symptomatology of low back pain and sciatica. The aim of this study was to test the effect of a specific therapeutic exercise protocol under the supervision and guidance of a qualified physiotherapist, in patients with lumbar disc herniation with clinical low back pain and/or sciatica who did NOT have neurological complications.

Methods: Therapeutic exercise was applied as an interventional method which can be used to improve the clinical picture of the patients. 61 patients with intervertebral disc herniation in the lumbar spine underwent a special therapeutic exercise for 50 min/d, twice a week for 6 months. The investigation took place in a specially designed physiotherapy room. The evaluation tools used were: 1. A visual analogue scale of pain (VAS) consisting of a 10 cm long horizontal line marked "absence of pain" at one end (0) and "worst possible pain" at the other end (10); 2. The keele STar Back screening Tool questionnaire which aims to identify predictive markers (both physical and psychosocial risk factors) for persistent, inhibitory pain in the TMJ, as well as to categorize patients into risk groups and guide treatment; 3. The Roland-Morris Disability Index, a questionnaire that assesses the disability index of each patient; 4. The Oswestry Disability Index (O.D.) a questionnaire that assesses limitations of various activities of daily living; and 5. The Hospital Anxiety and Depression scale (HADS) which is a scale to detect symptoms of depression and anxiety. These parameters were reassessed at the month and quarter since the implementation of the exercise protocol.

Results: There was significant improvement in all parameters after the intervention The VAS scale improved by 46.2%, the keele STar Back screening Tool improved 58.3%, the Roland–Morris Disability Index improved 64.2%, the O.D.I improved 67.4% and the HADS scale improved 46.2% in anxiety and 61% in depression. All the above parameters showed improvement after the end of the interventions with a percentage significant change before and after the intervention.

Conclusion: The specific therapeutic protocol of the study, accompanied by specific therapeutic exercises [Fig. 1] aimed at dynamic stabilization [4,5] of the lumbar spine, as well as stretching, had a positive effect on patients with lumbar disc herniation. The protocol helped and improved mobility and stability of the lumbar spine and reduced the patients' symptomatology. There were only positive clinical effects on the patients' functionality and mental health.

Finally, it should be noted that the treatment protocol was applied to patients who did not have neurological deficits.



References:

1. Ariëns GA, et al. Occup Environ Med 2001;58:200
2. Balogh I, et al. BMC Musculoskelet Disord 2019;20:139
3. Li Y, et al. Clin Orthop Relat Res 2015;473:1896
4. Takahashi N, et al. Spine 2003;28:435
5. Balkovec C, McGill S. Clin Biomech 2012;27:766

P346
TOWARDS A SYSTEM DYNAMICS MODEL FOR PREVENTION AND TREATMENT OF KNEE OSTEOARTHRITIS

S. A. Xergia[1], C. Matzaroglou[1], N. Liveris[1], C. Tsarbou[1], E. Tsepis[1], E. Billis[1], M. Tsekoura[1], J. Kvist[2], J. Gliatis[3], G. N. Papageorgiou[4]

[1]Dept. of Physiotherapy, Univ. of Patras, Patras, Greece, Patras, Greece, [2]Physiotherapy, Linköping Univ., Linköping, Greece, [3]Dept. of Orthopaedics, Univ. of Patras, Patras, Greece., Patras, Achaia, Greece, [4]Dept. of Management and Marketing, SYSTEMA Research Centre, School of Business Administration, Cyprus, Nicosia, Cyprus

Objective: Osteoarthritis (OA) is a serious chronic disease mostly affecting the knee joint. Despite the many efforts for developing strategies to prevent and control osteoarthritis (OA), the disease is on the rise[1]. Current methods are inadequate to deal with the high complexity and the multiple factors associated with the disease.
Methods: This paper proposes the development of the dynamic knee osteoarthritis simulation (DYNAMIKOS) model as a decision-making tool for health policy-makers to effectively deal with OA. The model is based on the system dynamics (SD) approach[2,3], which is incorporated for the case of the primary and secondary prevention of knee osteoarthritis (KOA). The paper goes through the main qualitative and quantitative procedures that are necessary in order to formulate and validate the DYNAMIKOS model. The first step is to identify the main factors affecting KOA and particularly, develop a causal loop model for the risk factors involved. This is followed by a series of group modeling building (GMB) workshops with experts and stakeholders. Next, a questionnaire survey is designed to collect retrospective data from a representative sample of KOA patients using experimental and control groups. Exploratory and confirmatory Factor Analysis would allow for structural equation modeling (SEM) to be applied before the final system dynamics model is developed.
Conclusion: The proposed DYNAMIKOS model could be used for effectively analyzing the complex interrelationships among the multiple factors that constitute the spread of KOA. In this way plausible prevention strategies could be implemented for effectively managing and leading the potential eradication of KOA.

References:

1. Long H, et al. Arthritis Rheumatol 2022;74:1172
2. Davahli MR, et al. Int J Environ Res Public Health 2020;17:1
3. Darabi N, Hosseinichimeh N. Syst Dyn Rev 2020;36:29

P347
MORPHOMETRIC SCIATIC NERVE CHARACTERISTICS IN LOW BACK PAIN WITH UNILATERAL RADICULOPATHY CAUSED BY DISC HERNIATION: AN ULTRASOUND IMAGING EVALUATION

C. Matzaroglou[1], A. Kolovou[2], Z. H. Dailiana[3], M. Tsekoura[4]

[1]Dept. of Physiotherapy, School of Health Rehabilitation Sciences, and Unit of Neuromuscular Diseases Univ. Hospital of Patras, Patras, [2]Dept. of Orthopaedic Surgery, Faculty of Medicine, School of Health Sciences, Univ. of Thessaly, Larissa, [3]Dept. of Orthopaedic Surgery, Faculty of Medicine, School of Health Sciences, Univ. of Thessaly, Larissa, [4]School of Health Rehabilitation Sciences, Dept. of Physiotherapy, Univ. of Patras, Patras, Greece

Objective: The word sciatic has Greek origin. Sciatic nerve (SN) is unique because it is not only the longest, but also the thickest nerve in the body. It has an extensive origin from lumbosacral plexus formed by the ventral rami of L4-S3 spinal nerves in the pelvic region [1,2,3,]. Ultrasonography [US], has been used recently to characterize median and ulnar nerves but is seldom used to characterize the lower extremity nerves as sciatic nerve. The reference standard for normal and pathologic lower extremity nerves has not been established.
Methods: 55 healthy volunteers with 110 sciatic nerves, aged 20–89 years old, were studied with US and compared with 59 volunteers' patients with 118 sciatic nerves aged 26–77 years old, which complained about sciatica, and they identified it with lumbar disc prolapse in MRI. Age, sex, height, weight was recorded, and the size and morphology of sciatic nerve were obtained at every predetermined sites. These data provide basic clinical data for the use of ultrasound for the future diagnosis, treatment, and prognostic evaluation of peripheral neuropathy of sciatic nerve [Fig. 1]. The statistical calculations were performed using Sigma Stat Plus software. A Spearman's rank-order correlation model was used in assessing the statistical significance of associations at 0.05 and 0.01 confidence, levels. The rationale for correlation coefficient analytical model in this study was to ascertain parameters positively and negatively correlated with herniated disc, and the chronicity of the symptoms of sciatica.
Results: The mean size of sciatic nerves were 0.578 ± 0.034 cm^2 in males and 0.488 ± 0.03 cm^2 females respectively. Pearson's correlation analysis showed that the mean size was correlated with height and weight. There was no difference in mean size among the different

ages. Women had smaller size of the sciatic nerves than men. Also, the "pathologic sciatic nerves have morphology of "edema", and the size were smaller [Fig. 2]. The statistical calculations were performed using Sigma Stat Plus software. Peripheral nerve ultrasonography is a reliable and reproducible diagnostic method in the hands of experienced examiners. Normal values for the sciatic nerve nerves are provided by our study but with not enough statistical power. Thus, reference values of Sciatic nerve of the lower extremity can facilitate the analysis of abnormal nerve conditions and give useful information and prognostic parameters in patients with sciatica and established nerves disc herniation.

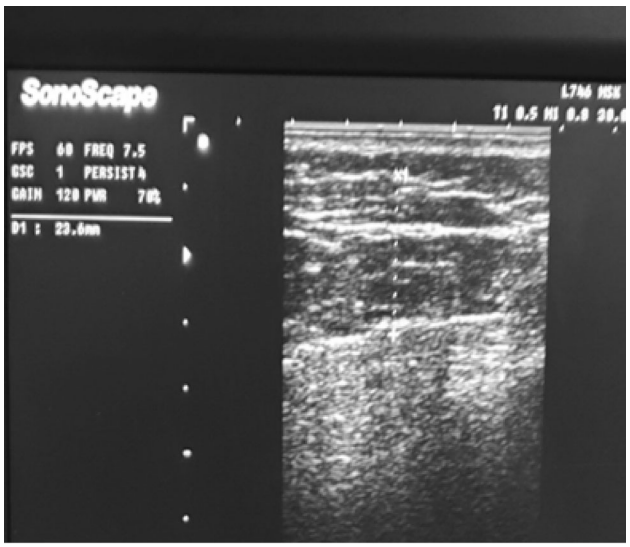


Figure 1. Normal sciatic nerve

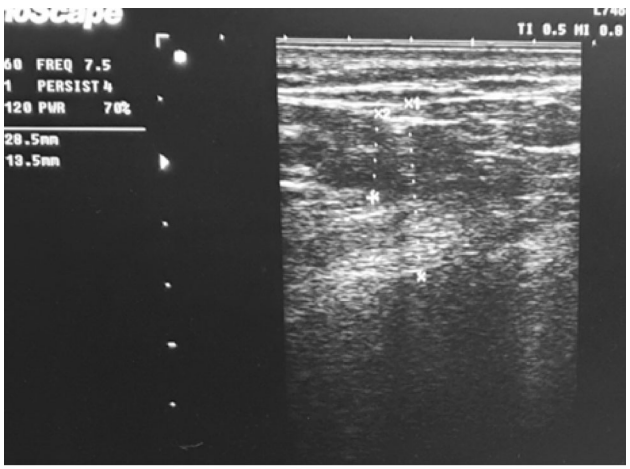


Figure 2. Sciatic nerve with morphology of "edema"

Conclusion: The abnormal nerve conditions and morphologic characteristics give useful information and prognostic parameters in patients with sciatica and established nerves disc herniation. Sciatic nerve unfortunately presents significant variations, its topography, and divisions [4,5]. The topographic variation shows sex effect due to differences in the dimension of pelvis that makes for the adaptability of female pelvis for pregnancy and childbirth. There are a lot of limitations in this study because SN shows substantial variations with landmark structures in the gluteal region [6]. Different population studies have highlighted some of these variations, most of which are variations in relation to piriformis [6,7].

References:

1. Adibatti M, Sangeetha V. J Clin Diagn Res 2014;8:AC07
2. Anbumani TL, et al. Int J Anat Res 2015;3:1121
3. Arifoglu Y, et al. Surg Radiol Anat 1997;19:407
4. Babinski MA, et al. Eur J Morphol 2003;41:41
5. Pecina M. Acta Anat (Basel) 1979;105:181
6. Pokorný D, et al. Surg Radiol Anat 2006; 28: 88
7. Matzaroglou C, et al. Osteoporos Int 2020;31:S588

P348

OSTEOPOROSIS-PROVOKED IN MYASTHENIS GRAVIS OF GLYCOCORTICOIDS GCS USAGE: OUR DATA AND LITERATURE REVIEW

C. Matzaroglou[1], A. Marouda[2], E. Matzaroglou-Heristanidu[3], K. Kafchitsas[4], E. Chroni[5]

[1]Dept. of Physiotherapy, School of Health Rehabilitation Sciences, and Unit of Neuromuscular Diseases Univ. Hospital of Patras, Patras, Greece, [2]School of Health Rehabilitation Sciences, Dept. of Physiotherapy, Univ. of Patras, Patras, Greece, [3]Faculty of Medicine, School of Health Sciences, Univ. of Patras, Patras, Greece, [4]Dept. of Spine Surgery, Asklepios Orthopedic Clinic Lindenlohe, Schwandorf, Germany, [5]Dept. of Neurology, Unit of Neuromuscular Disorders, Univ. of Patras, Patras, Greece

Objective: Myasthenia Gravis (MG) is an autoimmune neuromuscular disorder caused by antibodies that target the postsynaptic muscle membrane. The clinical feature of MG is a fluctuating marked weakness limited to the voluntary muscles with an initial manifestation of focal weakness. The main treatment is corticosteroid administration with improvement of muscle strength in all cases of MG [1,2,3]. The main course of treatment includes corticosteroids, yet they carry various side effects, with osteoporosis being particularly significant. Monitoring entails DXA examinations to evaluate bone density and examining biochemical markers such as osteocalcin, alkaline phosphatase, and vitamin D. This study aimed to define how corticosteroids, considering both duration and dosage, impact the wellbeing of patients. More specifically, we examined alterations in bone density and biochemical markers, exploring potential correlations among individuals with MG.

Methods: To assess this risk, we performed a case–control study including the patients in our Unit of Neuromuscular Diseases in University Hospital of Patras, between 2020–2023. Following the study selection, we compared data related to DXA measurements and bone turnovers Multivariate conditional logistic regression estimated odds ratios (ORs) among MG patients using oral glucocorticoids GCs vs. non-users. Adjustments were made for comorbidities and comedications.

Results: In our data identified 38 cases. Major osteoporotic fracture risk was found in 34/38 MG patients currently using oral GCs compared to MG patients (4) not on oral GCs. Cases were all subjects aged between 18–53 years old, who had sustained a major osteoporotic fracture (MOF) between January 1, 2020, and December 31, 2023. MOF was defined as a fracture of the hip, radius/ulna, vertebrae. In literature, 4 studies retrieved regarding MG, in patients of average age 55 years of both sexes. In a study with a population of 283 MG [4] patients receiving corticosteroids (50% with history of fractures and 50% without), DXA showed lower bone density values in subjects with fractures, while the alkaline phosphatase value showed no difference. In another study, comparing patients with MG and control group, it was found that the level of 25(OH)D was lower

in the first group, while alkaline phosphatase, calcium and phosphorus showed no differences in the two groups. In DXA measurement, low bone density values were found in MG patients. In a study focused on the effect of vitamin D, 33 MG patients were enrolled, with 23 receiving corticosteroids and divided into 2 subgroups: those receiving vitamin D and calcium supplementation, and those not. Measurements showed vitamin D and calcium deficiency in unsupplemented patients. A study [5,6] involving 80 MG patients and 62 controls examined the effect of cumulative corticosteroid dosing over 13 y. DXA testing showed low bone density (especially in the hip region) in MG patients compared to healthy subjects and in postmenopausal women compared to premenopausal women. MG patients also showed low osteocalcin.

Conclusion: Patients' osteoporosis is affected by the severity of MG with symptoms being associated with the likelihood of fractures. The risk of osteoporosis increases in case of low vitamin D [7]. Cumulative glucocorticoid use increases the likelihood of osteoporosis, especially in women. In conclusion, glucocorticoid-induced osteoporosis aggravates the quality of life of patients with MG. To avoid osteoporotic fracture, neurologists have to consider shortening the duration of glucocorticoids treatment for MG.

References:

1. Askmark LH. Eur J Neurology 2012;19:1554
2. Gwathmey KG, Burns TM. Semin Neurology 2015;35:327
3. Gilhus NE, et al. Nat Rev Neurol 2016;12:259
4. Gilhus NE, Verschuuren JJ. Lancet Neurol 2015;14:1023
5. Konno S, et al. PLoS One 2015;10:e0126579
6. Guan Y, et al. Osteoporos Int 2017;28:2383
7. Braz NFT, et al. Neurol Sci 2017;38:1405

P349
COMPLEMENT FACTOR H-RELATED PROTEIN-5 ENHANCES OSTEOBLAST DIFFERENTIATION

C. N. Son[1], J. H. Lee[1]

[1]Dept. of Rheumatology, Uijeongbu Eulji Medical Center, Eulji Univ. School of Medicine, Uijeongbu, South Korea

Objective: Complement factor H-related protein-5 (CFHR5), a member of the human factor H protein family, has been identified as an enhancer of complement activation. The impact of complement activation on bone and joint has been recognized as arthritis and osteomyelitis. Thus, we conducted a study to compare the effect of CFHR5 on the differentiation of osteoblasts.

Methods: We examined the mineralization of osteoblast cell line (MC3T3-E1 cells) treated with various dose of CFHR5 (0–1000 ng/mL) during osteoblast differentiation. To measure bone mineralization, alkaline phosphatase (ALP) activity and alizarin red S (ARS) was assessed in CFHR5-treated MC3T3-E1 cells for two distinct periods: the early period (1, 3, 7, and 10 d) and the late period (14, 21, and 28 d). Additionally, the levels of RUNX2 and OPN in CFHR5-treated MC3T3-E1 cells were observed by western blotting.

Results: The highest increase in ALP activity was observed in MC3T3-E1 cells at a concentration of 1000 ng/mL for 10 d. Moreover, the expressions of RUNX2 and OPN were significantly increased in treatment with 1000 ng/mL CFHR5 as comparison to that of control. Accordingly, ARS staining exhibited a notable increase in CFHR5 treated cells, indicating that augmentation of bone mineralization.

Conclusion: These findings suggest that CFHR5 promotes bone mineralization in MC3T3-E1 cells, and this effect is associated with the upregulation of RUNX2 and OPN expression.

P350
INSULIN-LIKE GROWTH FACTOR 2-FUSED LYSOSOMAL TARGETING CHIMERAS (ILYTAC) FOR DEGRADATION OF RANKL TO PROTECT OSTEOPOROSIS

C. P. Zhou[1], W. W. Gui[1], G. L. Wang[2], X. H. Lin[1]

[1]Dept. of Endocrinology and Metabolism, [2]Dept. of Orthopedics, Sir Run Run Shaw Hospital, College of Medicine, Zhejiang Univ., Hangzhou, China

Objective: IGF2 is closely associated with the occurrence and development of osteoporosis, with bone marrow mesenchymal stem cells being the main source of IGF2. This study investigates the role of IGF2 deficiency in inducing osteoporosis by constructing a mesenchymal stem cell-specific *Igf2* knockout mouse model. Additionally, the study explores the feasibility of using anti-RANKL@iLYTAC technology (Banik et al., 2020; Zhang et al., 2023), a lysosome-targeted protein degradation technique based on IGF2 fusion protein modules, to treat osteoporosis by selectively degrading the pathogenic protein RANKL in osteoclasts.

Methods: Single-cell sequencing datasets from 13 organs were collected from public databases for integrated single-cell sequencing analysis to examine the expression profile of IGF2 in different organs and tissues. A mesenchymal stem cell-specific *Igf2* knockout mouse model ($Prrx1\text{-}Cre^{+}Igf2^{fl/fl}$) was constructed using the *Cre/LoxP* system and the mesenchymal stem cell-specific Prrx1-cre tool mouse. Femurs of knockout and control mice were subjected to H&E staining and μCT scanning to observe changes in bone microstructure. Bone marrow mesenchymal stem cells (BMMSCs) were extracted for flow cytometry identification. Mouse-derived IGF2(mIGF2) protein was cloned, synthesized, and purified. Anti-RANKL@iLYTAC was formed by incubating the IGF2 protein with anti-RANKL, a monoclonal antibody drug used to treat osteoporosis, which inherently binds to the Fc domain of commercial IgG antibodies. Confocal laser scanning microscope (CLSM) was used to observe the process of iLYTAC(or IGF2-Z) transporting proteins to lysosomes for degradation. Western blot analysis was performed to validate the degradation effect on RANKL, as well as changes in autophagy proteins LC3 and SQSTM1/p62.

Results: Analysis of single-cell sequencing databases from 13 different organs indicated specific high expression of IGF2 in mesenchymal stem cells. We successfully constructed and identified the mesenchymal stem cell-specific *Igf2* knockout mouse model. μCT scanning of the femurs showed a decrease in trabecular number, BMD, and trabecular separation (Tp.Sp), as well as a decrease in cortical bone density (TMD) in the mesenchymal stem cell-specific *Igf2* knockout mice. CLSM revealed effective enrichment of RANKL in lysosomes after treatment with anti-RANKL@iLYTAC. Western blot analysis demonstrated that anti-RANKL@iLYTAC significantly activated autophagy levels and effectively degraded RANKL.

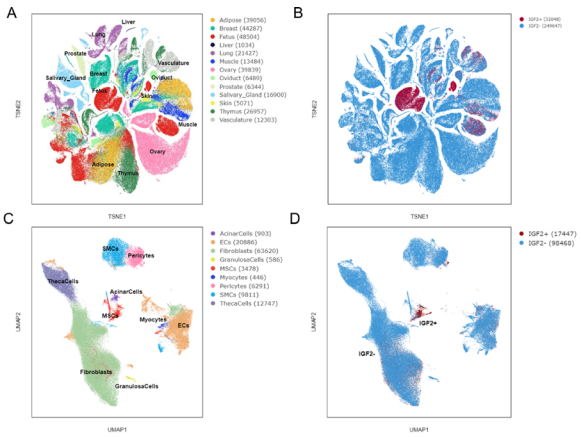


Figure 1. The analysis of integrated single-cell sequencing datasets from 13 different organs demonstrates that Igf2 exhibits high expression in mesenchymal stem cells. A. tSNE visualization analysis of the first-level clustering of single-cell transcriptomic sequencing results from 13 organs. B. Distribution of Igf2 across the 13 organs. C. UMAP visualization analysis of the second-level clustering of stromal cells. D. Specific high expression of Igf2 in the subpopulations of mesenchymal stem cells within stromal cells.

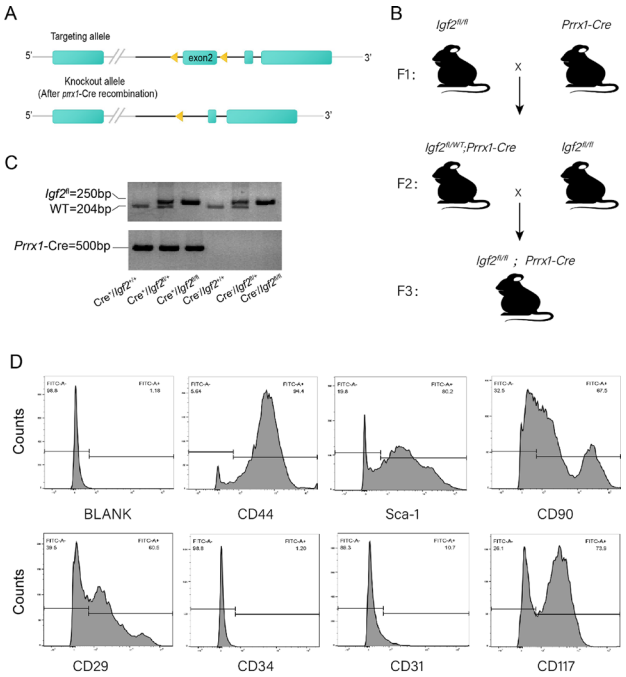


Figure 2. (A-C) The construction of *Prrx1-Cre*$^{+}$*/Igf2*$^{flox/flox}$ mouse. (D)Flow cytometry identification of BMMSC: CD44^{+}, Sca-1^{+}, CD34^{-} and CD31^{-}.

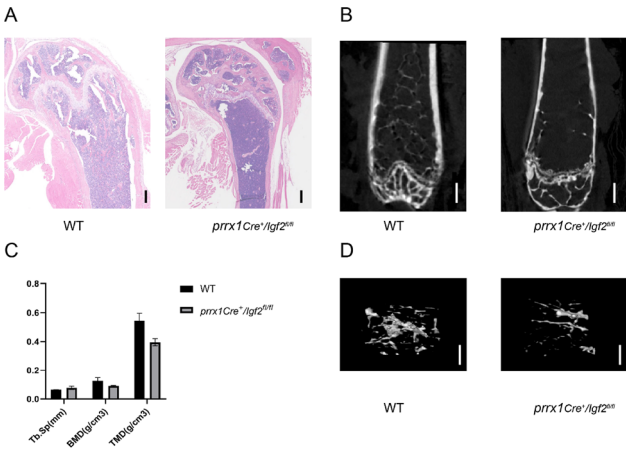


Figure 3. IGF2 deficiency promotes osteoporosis. (A)The representative of H&E staining in femora from *Prrx1-Cre*$^{+}$ *Igf2*$^{flox/flox}$ mice and WT mice. Scale bars: 500 μm. (B-D) Representative μCT images (B,D) and quantitative μCT analysis of bone mass and microarchitecture (C) in femora from *Prrx1-Cre*$^{+}$ *Igf2*$^{flox/flox}$ mice and WT mice. Scale bar: 1 mm.

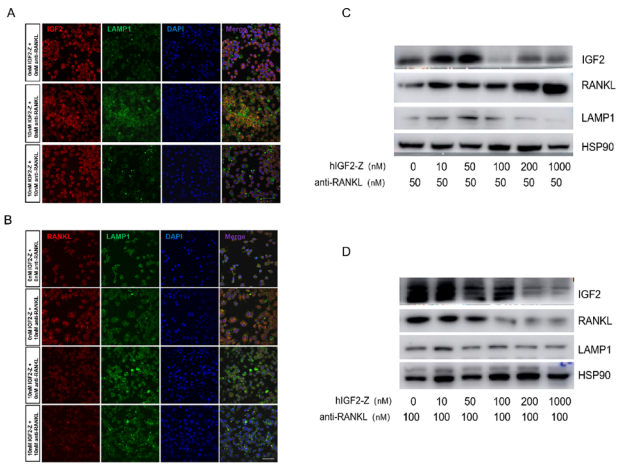


Figure 4. (A-B) CLSM images show the enrichment process of IGF2 and RANKL into lysosomes by 10nM anti-RANKL@iLYTAC. IGF2: red; RANKL: red; LAMP1: green. Scale bar=10μm (C)WB analysis of concentration-dependent human IGF2-Z(hIGF2-Z) and Anti-RANKL (fixed at 50 nM) on inducing RANKL and LAMP1 variation from cells *in vitro*. (D)WB analysis of concentration-dependent hIGF2-Z and anti-RANKL@iLYTAC (fixed at 100 nM) on inducing RANKL and LAMP1 variation from cells *in vitro*.

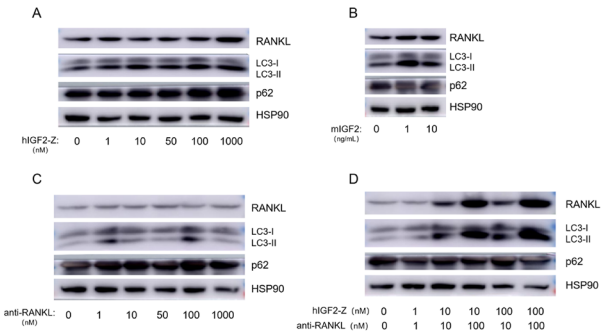


Figure 5. (A)WB analysis of RANKL, LC3 and p62 in hIGF2-Z from 0-1000nM from cells *in vitro*. (B)WB analysis of RANKL, LC3 and p62 in synthesized mIGF2 from 0-10nM from cells *in vitro*. (C)WB analysis of RANKL, LC3 and p62 in Anti-RANKL from 0-1000nM from cells *in vitro*. (D) WB analysis of RANKL, LC3 and p62 in Anti-RANKL@iLYTAC from cells *in vitro*.

Conclusion: IGF2 is specifically highly expressed in mesenchymal stem cells. Mesenchymal stem cell-specific *Igf2* knockout mice effectively induce symptoms of osteoporosis. In vitro treatment of cells with Anti-RANKL@iLYTAC showed effective targeted transport of RANKL to lysosomes and its subsequent degradation by activating lysosomal autophagy. These findings suggest that iLYTAC technology, with IGF2 as a universal module, may be an effective novel approach for treating osteoporosis.

References:

1. Banik SM, et al. Nature 2020;584; 291
2. Zhang B, et al. J Am Chem Soc 2023;145:24272

P351
HIP CARISKORE: A CLINICAL TOOL FOR IMPROVING THE APPROPRIATENESS OF ECHOCARDIOGRAPHY IN ORTHOGERIATRIC PATIENTS

C. Properzi[1], V. Gemo[1], F. Perini[1], M. Baroni[1], C. Ruggiero[1]

[1]Geriatric and Orthogeriatric Unit, SM Misericordia Hospital, Univ. of Perugia, Perugia, Italy

Objective: The hip fracture requires surgical repair within 24–36 h. Cardiovascular risk assessment is recommended by the ACC/AHA guidelines in the presence of organ-specific symptoms, clinical signs and history of disease. In clinical practice, the request for transthoracic echocardiography (TTE) is often performed in the absence of symptoms and as a screening for cardiac disease that would rarely change perioperative management. This behavior results in unnecessary additional examinations and potential surgical delay. The purpose of this study is to develop a clinical practice score based on clinical-instrumental elements for improving the appropriateness of requesting and performing TTE in the preoperative phase.

Methods: Prospective observational study conducted in 385 orthogeriatric patients consecutively admitted to the Orthogeriatric Unit of Hospital of Perugia from January to September 2023. The Hip CaRiskore was defined by a multidisciplinary evaluation and included the following criteria: unknown systolic murmur, METs < 4, overload alterations on EKG. The simultaneous presence of the three criteria was a prerequisite for the TTE request. The study evaluated whether Hip CaRiskore determines valid criteria for requiring TTE, the likelihood that it reveals cardiac pathology that could modify medical or anesthesiologic management, and whether it is able to reduce unnecessary use of TTE and consequently delayed access to surgery.

Results: Of the 385 participants, patients' TTE with positive Hip CaRiskore were more likely to detect disease (43.24% for moderate-severe aortic stenosis and 29.73% for moderate-severe mitral regurgitation) compared with patients TTE with systolic murmur (23.62% and 14.96% respectively) and negative Hip CaRiskore (4.31% and 6.03% respectively). We analyzed the association with moderate-severe aortic stenosis of Hip CaRiskore and systolic murmur and we obtained that Hip CaRiskore predicts moderate-severe aortic stenosis with a higher probability (49%) than systolic murmur (36%).

Conclusion: By integrating ACC/AHA guidelines with Hip CaRiskore, we can improve the appropriateness of TTE request, reducing resource use and delay in access to surgery without sacrificing patient safety.

P352
PREVIOUS BISPHOSPHONATE THERAPY AND BASELINE SERUM P1NP AS INDICATORS OF SIX-MONTH BONE MINERAL DENSITY RESPONSE TO ROMOSOZUMAB: REAL WORLD DATA FROM A METABOLIC BONE SERVICE IN ENGLAND

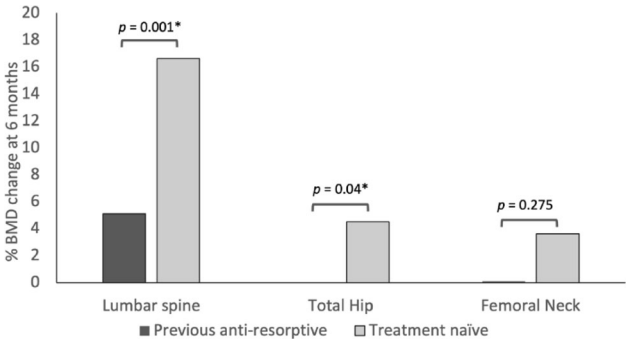
C. Rakieh[1], T. Roberts[1], J. Cole[1], M. K. Javaid[2], B. Tins[3], C. Mennan[1], D. E. Powell[1]

[1]Metabolic Bone Disease Unit, Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswestry[2]NDORMS, Univ. of Oxford, Oxford, UK, [3]Radiology Dept., Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswestry, UK

Objective: To describe real-world patient acceptability of romosozumab in an English patient population and assess the percent change in BMD at 6 months.

Methods: Patients attending a metabolic bone centre in England in 2023 were included in this retrospective single centre study. Women aged > 50 y with a major osteoporotic fracture (MOF) within two years and a BMD T-score $\leq$ -2.5, at the lumbar spine (LS), total hip (TH), or femoral neck (FN) were considered eligible according to the national guidelines. BMD measurements and serum P1NP levels were measured at baseline (prior to treatment) and at month 6.

Results: Of the 124 patients offered romosozumab, 105 (85%) agreed to start treatment between January-December 2023. Data at 6 months were available for 17 patients: mean age 73.2y $\pm$ 9.9, 82% with a vertebral fracture and 52.9% with additional non-vertebral MOF including 29.4% with a hip fracture, 9 (53%) patients were treatment-naïve, and 8 (47%) had previous bisphosphonates (4 alendronate, 1 risedronate, and 3 zoledronate). At 6 months, a significant BMD gain of 10.9% was observed at LS ($p < 0.001$), while FN and TH demonstrated modest BMD gains of 2.4% and 2.3%, respectively, which were not statistically significant ($p > 0.05$). Treatment-naïve patients showed significantly greater gains in BMD at LS (16.6 vs. 5.2%, $p = 0.001$) and TH (4.5 vs. $-$ 0.02%, $p = 0.04$) compared with those on previous bisphosphonates (Figure). Strong positive correlations were found between baseline P1NP and BMD %change at the LS ($r = 0.75$, $p < 0.001$) and FN ($r = 0.78$, $p < 0.001$) with a weaker positive correlation at the TH ($r = 0.49$, $p = 0.059$).



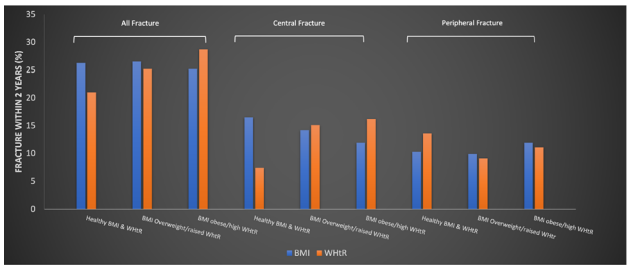
Conclusion: This real-world data demonstrates, for the first time, a high patient acceptability of romosozumab with rapid BMD gains in an English patient population. The changes in BMD observed at 6 months are comparable to those reported in the ARCH trial. However, the BMD response is blunted by previous bisphosphonate therapy, which highlights the importance of osteoporosis treatment sequence for optimal patient management. P1NP at baseline may play a role in patient selection, but more data is needed to explore this area.

P353
THE RELATIONSHIP BETWEEN CENTRAL ADIPOSITY MEASURED BY WAIST TO HEIGHT RATIO, BMI OBESITY AND RECENT OSTEOPOROTIC FRACTURE: A CROSS-SECTIONAL STUDY

C. Rakieh[1], D. E. Powell[1], C. Mennan[1], B. Tins[2], T. Roberts[1], M. K. Javaid[3]

[1]Metabolic Bone Disease Unit, Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswestry, [2]Radiology Dept., Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswestry, [3]NDORMS, Univ. of Oxford, Oxford, UK

Objective: To assess the relationship between BMI, waist to height ratio (WHtR), and the prevalence of recent osteoporotic fracture including all, central, and peripheral fractures within 2 y.
Methods: A cross-sectional retrospective, single-centre study assessing consecutive female patients aged > 50 years old who attended a BMD scan at a UK metabolic bone service in 2023. Recent osteoporotic fractures within 2 years were assessed for: all fracture, central fracture (spine, hip, rib, pelvis, and proximal humerus) and peripheral fracture (distal humerus, forearm, distal femur, proximal tibia/fibula, and ankle). A logistic regression analysis was performed to assess the association between fracture sites, WHtR groups (healthy 0.4–0.49, raised 0.5–0.59, and high central adiposity ≥ 0.6), and BMI groups (healthy 18.5–24.9, overweight 25–29.9, and obese ≥ 30).
Results: 515 patients were included: mean age (y) 71.2 ± 10.4, mean BMI 27.5 ± 5.9, mean WHtR 0.58 ± 0.08, mean total hip T-score -1.35 ± 1.14, prevalence of recent fracture was 26% including 14.4% central fracture. Significant differences in fracture distribution were found between BMI and WHtR classification systems ($p < 0.01$) (Figure). When adjusted for total hip BMD, patients with high central adiposity had significantly higher rates of all (OR 2.1, 95% CI 1.1–4.2) and central fracture (OR 4.2, 95% CI 1.6–11.1) compared to those with normal central adiposity. These significant associations were independent of BMI and age. BMI categories showed opposite association with central fracture with a tendency to fewer central fracture in those who were overweight and obese, but the changes did not reach statistical significance. BMI values, however, demonstrated a significantly negative association with central fracture, OR 0.91, 95% CI 0.85–0.99. No significant associations were found between either BMI and WHtR categories and peripheral fracture.



Conclusion: These results indicate a clear discordance between BMI and WHtR associations with a recent central fracture. Central adiposity appears to be a potential risk factor for central fracture. More data is needed to confirm these results and evaluate the added value of using central adiposity in routine fracture risk assessment.

P354
ENHANCED INFLAMMATORY TH17 CELLS DURING LEPROSY REACTIONS AUGMENT BONE LOSS

C. Saini[1], L. Sapra[1], A. Bhardwaj[1], V. Ramesh[2], P. Puri[3], R. K. Srivastava[1]

[1]Dept. of Biotechnology, All India Institute of Medical Sciences, Delhi, [2]Dept. of Dermatology, ESI College and Hospital, Faridabad, [3]Dept. of Dermatology, SJH, Delhi, India

Objective: Osteoporosis in type 1 reactions (T1R) of leprosy is an inflammatory condition. Leprosy reaction itself and steroid treatment to cure it can modulate bone health. Th17 cells are associated with inflammation in both leprosy T1R reactions and bone loss. Thus, their role in leprosy-mediated bone loss needs to be deciphered. We aimed to assess the role of Th17 cells in patients with leprosy T1R reactions.
Methods: This study involved 10 patients with leprosy reaction (T1R-S) treated with steroids (prednisolone) and 10 non-reaction (NR) patients (borderline tuberculoid) attending the leprosy clinics in the Department of Dermatology, Safdarjung Hospital, New Delhi, India. For the recruitment of patients, BMD was measured in the spine, femur, neck and forearm by DXA. PBMCs were stimulated with *MLSA (Mycobacterium leprae sonicated antigen)* for 48 h. By using flow cytometry, we identified Th17 cells in the peripheral blood mononuclear cells. Gene expression of cytokines, such as *IL-17A and TGF-β* and *RUNX2, P1NP* (osteoblast markers) was further examined using real-time PCR (q-PCR) in the stimulated PBMCs of both type of leprosy patients.
Results: T1R-S patients had significantly ($p < 0.05$) higher percentages of IL-17A-producing Th17 ($CD3^+CD4^+$ $CCR6^+IL\text{-}17^+$) cells as compared with non-reaction (NR) patients. Of interest, T1R-S showed significantly ($p < 0.002$) lower percentages of Treg cells ($CD3^+CD4^+CD25^+FOXP3^+$) than NR patients. Surprisingly, osteoblast markers (*RUNX2* and *P1NP*) showed a significant ($p < 0.02$) positive correlation with IL-17 cells. Moreover, inflammatory cytokines IL-17A mRNA expression were significantly ($p < 0.01$) high in T1R-S patients in stimulated PBMC as compared to NR patients. On the other hand, TGF-β was significantly ($p < 0.03$) high in NR as compared to T1R-S patients.
Conclusion: Participants with leprosy reactions and steroid treatment have enhanced levels of pathogenic/inflammatory Th17 cells, which could lead to leprosy-reaction-mediated bone loss. The study has clinical implications with respect to the management of bone health in leprosy disease conditions.

P355
BILATERAL TRANSIENT OSTEOPOROSIS OF THE HIP: A NEGLECTED CAUSE OF HIP PAIN DURING PREGNANCY

C. Soares[1], H. Hugo[1], M. Maria[1], A. Anita[1], S. Susana[1], D. Daniela[1]

[1]Unidade Local de Saúde do Alto Minho, Ponte de Lima, Portugal

In pregnancy and lactation women need to supply an increased amount of calcium daily, supported by increased intestinal absorption in pregnancy and maternal bone resorption during lactation. Assim, changes in bone microarchitecture may occur, temporarily reducing skeletal strength.

We report a case of a 39-year-old woman, who presented at the Rheumatology department two weeks post-cesarean delivery with bilateral coxalgia. The patient without relevant personal history, reported the onset of left mechanical hip pain from 33 weeks of pregnancy with a progressively worsening accompanied by limited mobility and an inability to walk, requiring the use of crutches for ambulation. After delivery, similar complaints arose on the right side. There was no history of trauma or other accompanying symptoms. The patient promptly underwent a hip x-ray which showed a decrease in bone density in the left hip. Later, the MRI revealed bone edema in femoral heads and acetabulum (Fig. 1). The hemogram and phospho-calcium metabolism were normal and the acute phase parameters were negative. Bone densitometry, carried out 2 months after delivery, showed a T-score of -1.8 at the femoral neck and at the lumbar spine. The diagnosis of transient osteoporosis of the hip (TOH) was established and the patient underwent analgesia and rest with a later gradual increase in the load.

In the follow-up appointment, 7 months later, she was asymptomatic, and the X-ray showed normalization of the previously detected changes in bone density. Pregnancy is a recognized risk factor for TOH, especially in the last trimester. Clinically it presents as a sudden and progressive onset of back, groin, hip, or lower extremity pain that can affect joint mobility and typically worsens with weightbearing. MRI is the imaging test of choice and typically TOH resolves in the first year after delivery with conservative strategies.

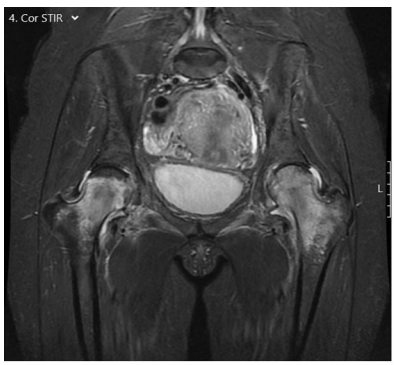


Figure 1. Coronal-STIR sequence shows a signal hyperintensity of the femoral head and neck bilaterally, left acetabulum, and in the external obturator and adductor muscles.

P356
CO-DESIGNING AN OSTEOPOROSIS EDUCATION PROGRAM WITH CONSUMERS FOR MULTICULTURAL COMMUNITIES IN AUSTRALIA

C. Tang[1], B. Brady[2], D. Lim[3], B. Sidhu[2], W. Chen[4], S. Carter[5], T. Wong[6], J. Center[4]

[1]Institute of Health and Sport, Victoria Univ., Melbourne, [2]South Western Sydney Local Health District, Liverpool, [3]Centre for Improving Palliative, Aged and Chronic Care through Clinical Research and Translation (IMPACCT), Univ. of Technology Sydney, Ultimo, [4]Garvin Institute of Medical Research, Darlinghurst, [5]Faculty of Medicine and Health, Univ. of Sydney, Sydney, [6]No affiliation (consumer), Sydney, Australia

Objective: Older people of Asian descent experience a high risk of osteoporosis (OP). Lack of culturally appropriate resources to support diagnosis and management of the condition can hinder their ability to self-manage. This study partnered with consumers from Mandarin, Cantonese and Vietnamese speaking backgrounds and health professionals to co-design a culturally appropriate osteoporosis education and self-management program.
Methods: The study was conducted in Greater Western Sydney, one of the most culturally diverse regions in Australia. Eleven consumers with lived experience of OP, representing three language groups, and 12 health professionals were recruited. Using the experience-based co-design approach, interviews and workshops were first conducted separately with consumers and health professionals to explore the challenges experienced along the journey of OP diagnosis and management. Subsequently, two workshops were held, where consumers and health professionals worked in collaboration to develop OP resources. Challenges in the journey of care were analysed using an interpretive phenomenological approach while a categorical analysis was conducted in the second phase of the study to highlight the key touchpoints that guided the development of the OP resources.
Results: Challenges in the journey of care included (i) lack of access to reliable sources of information related to bone health, (ii) OP viewed by consumers as a normal part of ageing, and (iii) the lack of opportunity to discuss matters related to bone health with their health professionals. Three key components were identified for the development of resources: (1) the need for multi-media resources, (2) consumer-friendly in-language written materials and (3) involvement of community health workers for dissemination.
Conclusion: The findings highlighted what people from multicultural communities want in an OP resource and provided a practical guide for the key components of such a resource.
Acknowledgements: Arab Council Australia, South Western Sydney and Western Sydney Multicultural Health departments.
Disclosure: Funding from Dept. of Health, Australia and the Age and Ageing Clinical Academic Group, SPHERE, Sydney.

P357
EVALUATING THE IMPACT OF A CO-DESIGNED OSTEOPOROSIS EDUCATION PROGRAM (MINDSET) FOR MULTICULTURAL COMMUNITIES IN AUSTRALIA

C. Tang[1], B. Brady[2], B. Sidhu[2], D. Lim[3], W. Chen[4], S. Carter[5], T. Wong[6], J. Center[4]

[1]Institute of Health and Sport, Victoria Univ., Melbourne, Melbourne, Australia, [2]South Western Sydney Local Health District, Liverpool, Australia, [3]Centre for Improving Palliative, Aged and Chronic Care through Clinical Research and Translation (IMPACCT), Univ. of Technology Sydney, Ultimo, Australia, [4]Garvin Institute of Medical Research, Darlinghurst, Australia, [5]Faculty of Medicine and Health, Univ. of Sydney, Sydney, Australia, [6]No affiliation (consumer), Sydney, Australia

Objective: Osteoporosis (OP) education programs are effective for improving older people's knowledge about the disease. Using a co-designed OP education program—MultIcultural commuNities co-DeSigned ostEoporosis Toolkit (MINDSET), this study aimed to evaluate the reach, acceptability, feasibility and effects of this program on older people from three selected language groups (Mandarin, Cantonese and Vietnamese).
Methods: The study was conducted in Greater Western Sydney, one of the most culturally diverse regions in Australia between October 2022 and June 2023. Ten bilingual community health workers were

trained to deliver the MINDSET program to people from the three selected language groups in the community. The reach of the program was evaluated based on the number of attendees of the program and the number of community sessions. Feasibility and acceptability were evaluated via a study-specific questionnaire administered to workshop participants appraising their satisfaction with the program. All attendees were required to complete a pre-post OP Knowledge Assessment Tool (OKAT), a validated outcome measure to evaluate osteoporosis-related knowledge.

Results: A total of 157 participants (n = 98 Mandarin/Cantonese-speaking and 59 Vietnamese-speaking) were recruited for the study. All groups highly rated the intervention for its feasibility and acceptability, with 90% of participants stating that they would likely/very likely recommend the program to others. There was also a significant improvement in pre-post scores on the OKAT in both the Mandarin/Cantonese group (mean difference 2.3, 95% CI 1.4–3.1) and the Vietnamese group (mean difference 2.1, 95% CI 1.3–2.9).

Conclusion: The findings provide preliminary evidence that MINDSET is an acceptable, feasible and effective community-based education program to improve OP-specific knowledge. Future research needs to evaluate if such community-based programs can be further adapted to facilitate behaviour changes towards positive OP management.

Acknowledgements: South Western Sydney and Western Sydney Multicultural Health departments.

Disclosure: Funding from Dept. of Health, Australia and the Age and Ageing Clinical Academic Group, SPHERE, Sydney.

P358
EXPLORING SELF-CARE EXPERIENCES IN OSTEOPOROTIC PATIENTS: A SYSTEMATIC REVIEW

C. Tedesco[1], V. Bernalte Martí[2], G. Pucciarelli[3], E. Vellone[3], E. Basilici Zannetti[3], N. Cittadini[3], A. Pennini[3], U. Tarantino[4], R. Alvaro[3]

[1]Dept. of Biomedicine and Prevention, Univ. of Rome Tor Vergata, Rome, Italy, [2]Dept. of Nursing, Faculty of Health Sciences, Univ. of Jaume I, Castellón de la Plana, Spain, [3]Dept. of Biomedicine and Prevention Univ. of Rome Tor Vergata, Rome, Italy, [4]Dept. of Orthopaedics and Traumatology Policlinico Tor Vergata Foundation, Univ. of Rome Tor Vergata, Rome, Italy

Objective: To summarize knowledge about experiences in self-care behaviors, according to Riegel's middle range theory of self-care (1), in patients affected by osteoporosis.

Methods: A systematic review was conducted to identify qualitative and mixed methods studies, through database research performed on 6 databases (PubMed, Web of Science, ProQuest, CINAHL, Scopus, and Cochrane) until June 2023, with 27 papers identified. The methodological quality of the articles was ensured using the JBI Critical Appraisal Tool for Qualitative Research (2).

Results: The three dimensions of self-care appear to be recognised in the articles, as seen in Fig. 1. The most addressed dimension of self-care in this review is 'maintenance', principally associated with adherence to therapy; 'management' mainly related to the management of symptoms, and 'monitoring' predominantly related to instrumental tests. A relevant cross-cutting topic that emerges is the relationship with healthcare professionals. For every main dimension of self-care, several subthemes were identified: This implication could help researchers better understand the specific self-care experience in osteoporosis. In detail, for self-care 'maintenance' seven subthemes have been identified, while for 'management' and 'monitoring' four have emerged (Fig. 1).

	SELF-CARE MAINTENANCE	SELF-CARE MONITORING	SELF-CARE MANAGEMENT
SUBTHEMES →	ADHERENCE/NON-ADHERENCE TO THERAPY ATTITUDES TOWARD THERAPY RELATIONSHIP WITH HEALTHCARE PROFESSIONALS DIET PHYSICAL ACTIVITY FRACTURE RISK REDUCTION LIFESTYLE CHANGES	DIAGNOSTIC AND INSTRUMENTAL TESTS PERCEPTION OF SYMPTOMS AND RISKS INTERPRETATION OF TEST RESULTS RELATIONSHIP WITH HEALTHCARE PROFESSIONALS	MEDICATION MANAGEMENT PROACTIVE ACTIONS FOR MANAGEMENT SYMPTOMS AND DISEASE MANAGEMENT BARRIERS AND FACILITATORS IN MANAGEMENT
AUTHOR (Year) ↓			
Wilkins (2001)			x
Unson et al. (2003)	x		
Jochna et al. (2005)	x		
Lau et al. (2008)	x		
McKenna et al. (2008)	x	x	x
Brod et al. (2008)	x		x
de Souza et al. (2010)		x	x
Mazor et al. (2010)	x	x	
Nielsen et al. (2011)	x		x
Solimeo et al. (2011)	x	x	x
Sale et al. (2011)	x		
Beaton et al. (2012)	x	x	x
Bruyer et al. (2012)	x	x	
Salter et al. (2014)	x	x	
Sale et al. (2014)	x	x	x
Baert et al. (2015)	x		
Alami et al. (2016)	x	x	
Dohm et al. (2016)	x	x	x
Hansen et al. (2017)	x	x	x
Swart et al. (2018)	x	x	
Barrenilla-Wong et al. (2020)	x		
Linton et al. (2020)	x		x
Xu et al. (2020)	x		
Ansari et al. (2021)	x		x
Ziebart et al. (2022)	x		x
Narayanasamy et al. (2022)	x	x	x
Tibert et al. (2023)	x		x

Figure 1. Dimensions of self-care addressed by each study

Conclusion: The findings of this review point towards the implementation of educational interventions related to self-care maintenance, monitoring, and management that should be encouraged; They should be led by specially trained health professionals, particularly nurses, providing specific information to avoid incompleteness and confusion. These aspects are also supported by the literature (3–7). Consequently, more education in the area of self-care behaviours could contribute to the empowerment of the patient and to the improvement of quality of life: maintaining a self-care attitude could allow osteoporotic patients to live a more stable and controlled life.

References:

1. Riegel B, et al. ANS Adv Nurs Sci 2012;35:194
2. Lockwood C, et al. Int J Evid Based Healthc 2015;13:179
3. Basilici Zannetti E, et al. Ig Sanita Pubbl 2017;73:65
4. Alvaro R, et al. Orthopaedic Nursing 2015;34:340
5. Cittadini N, et al. Maturitas 2022;161:7
6. Alvaro R, et al. Clin Cases Miner Bone Metab 2015;12:43
7. Pennini A, et al. Ann Ig 2016;28:252

P359
STANDARDIZATION OF TOTAL BODY COMPOSITION PARAMETERS BY DUAL-ENERGY X-RAY ABSORPTIOMETRY AND ITS IMPACT ON BODY COMPOSITION-DERIVED DIAGNOSTICS: THE OSTEOLAUS COHORT

C. Vendrami[1], G. Guillaume[1], E. Gonzalez Rodriguez[1], O. Lamy[2], D. Hans[1], E. Shevroja[1]

[1]Interdisciplinary Center of Bone Diseases, Rheumatology Unit, Bone and Joint Dept., [2]Internal Medicine Unit, Medicine Dept., Lausanne Univ. Hospital and Univ. of Lausanne, Lausanne, Switzerland

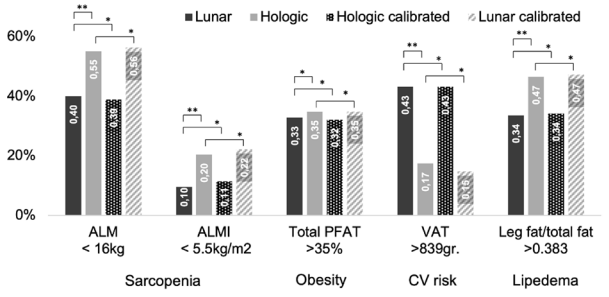
Objective: To standardize body composition (BC) parameters between the latest generation of DXA: Hologic Horizon A System™ and GE Lunar iDXA™; and to assess the impact of this standardization on the prevalence of BC derived diagnostics.

Methods: This study includes 926 postmenopausal women with whole body DXA assessment on each device, during the same day, following the ISCD guidelines. Participants were 72.9 ± 6.9 y,

measured 160.3 ± 6.6 cm and weighted 66.1 ± 12.7 kg. The dataset was split in a train (80%) and test (20%) subsets, stratified for age, height and weight; the standardization equations were derived from the train set and evaluated in the test set. We performed visual (Bland–Altman) and numerical (Pearson/Spearman, t-test/Wilcoxon) comparisons for each DXA-device measure. The standardization equations were derived following backward stepwise multiple linear regressions. Their performance was assessed in both datasets using r-squared and mean absolute error. The impact of this standardization on diagnostics of sarcopenia, lipedema, cardiovascular risk and obesity was assessed in the test set using relative risk (RR), accuracy, kappa score and McNemar tests.

Results: Total and regional body mass were similar ($p > 0.05$) and highly correlated (0.97–0.99) between devices. Bone mineral content (BMC) was higher for all regions in Lunar ($p < 0.05$), while fat and lean mass differed based on the region. Regression equations showed high performance metrics in both datasets. The RR of sarcopenia was 1.37 and 2.13 higher ($p < 0.05$) in Hologic using appendicular lean mass (ALM) and ALM/height^2, respectively; lipedema was 1.39 higher ($p < 0.05$) based on leg fat/total fat; cardiovascular risk was 0.40 lower ($p < 0.05$) based on visceral adipose tissue mass; obesity was not different ($p > 0.05$) based on percent fat. After standardization, these classification differences disappeared, accuracies and kappa scores increased (Fig. 1).

Figure 1: Prevalence of clinical diagnosis cut-offs per devices before and after standardization



Legend: p-value from McNemar test: p*>0.001, p**<0.001; ALM: Appendicular Lean Mass; ALMI: ALM/height^2; PFAT: percent fat; VAT: Visceral Adipose Tissue

Conclusion: This is the first and largest study to standardize DXA devices comprising all BC regions and parameters, including with an internal validation step. Differences in DXA devices and software impact BC assessment. Up to twofold differences in prevalence were seen in BC derived diagnostics. Providing inter-DXA-devices standardization equations addresses this issue. External validation is further needed. Further studies and disease definitions shall consider device differences.

P360
WHAT IS THE EFFECT OF HORMONE REPLACEMENT THERAPY (HRT) ON PREVALENCE, INCIDENCE, AND SEVERITY OF OSTEOARTHRITIS (OA) OF THE KNEE, HIP AND HANDS? A SYSTEMATIC REVIEW

C. W. Hillman[1], K. Marino[2], O. O'Sullivan[1], S. Kluzek[1], R. Atkinson[3], A. Hassan[4]

[1]Univ. of Nottingham, Nottingham, [2]Keele Univ., Keele, [3]Nottingham Univ. Hospitals NHS Trust, Nottingham, [4]Institute of Sport, Exercise and Health (ISEH), London, UK

Objective: Osteoarthritis (OA) is a degenerative disease that can lead to pain, reduced mobility, quality of life and disproportionately affects women[1]. This review explores the effect of HRT on the prevalence, incidence or severity of hip, knee or hand OA in peri- or post-menopausal women.

Methods: A systematic review was performed using PRISMA guidelines and prospectively registered on PROSPERO and a search was conducted (7/10/22) on Medline. Two independent reviewers screened results, extracted the data, and conducted a quality assessment with the Risk of Bias In Non-randomized Studies—of Exposure (ROBINS-E) tool, with a third reviewer for arbitration. Studies were primary research using validated patient reported outcome measures (PROMs) or objective measures of OA.

Results: 27 studies were included, all observational in design. 11 studies assessed hip OA, 19 assessed knee OA, and 8 assessed hand OA. Methods of outcome measurement included radiographic measures (n = 16), joint replacement surgery (indicated by OA) (n = 9), healthcare records (n = 1), and PROMs (n = 1). Most studies (n = 17) were considered to have a'High Risk of Bias'. Positive correlations between HRT use and hip or knee replacement were observed across studies. Results were inconclusive for other outcome measures and the hand.

Conclusion: The included studies varied considerably in terms of confounder adjustment, exposure, and outcome measurement. Despite these limitations, use of HRT appears to be associated with an increased risk of receiving a knee or hip joint replacement indicated by OA. Informed by our critique of the literature, suggestions for high quality research, including appropriately analysed confounders, appropriate exposure control and use PROMs alongside objective measures of disease are discussed.

Reference: (1) Srikanth VK, et al. Osteoarthritis Cartilage 2005;13:769.

P361
FACTORS RELATED TO FUNCTIONAL PROGNOSIS AFTER FRAGILITY HIP FRACTURE

C. Y. Chu[1], Y. Chan[1], Y. K. Tan[1], S. T. Yip[1], N. F. Lui[1], K. L. Tiu[2], K. B. Lee[2], W. Li[2], K. K. Li[2]

[1]Occupational Therapy Dept., [2]Dept. of Orthopedics & Traumatology, Queen Elizabeth Hospital, Hong Kong, SAR China

Objective: Fragility hip fracture often leads to a decline in functional capacity in elderly patients. Functional outcome could be influence by a variety of factors. Understanding those factors may help occupational therapists intervene early to improve patient's recovery and facilitate discharge and triage planning. We aimed to identify factors related to functional prognosis after fragility hip fracture.

Methods: Patients aged 60 or above who suffered from fragility hip fracture and attended Fragility Fracture Day Rehabilitation Program (FFDR) after hospital discharge in between September 2022 to October 2023 were recruited in this retrospective study. All subjects underwent either conservative or operational intervention during the hospital stay. Occupational therapists, allied with doctors, nurses and physiotherapists, provide education on bone health, fall prevention and rehabilitation training in the FFDR. Demographics including age, gender, cognitive status measured by Abbreviated Mental Test (AMT), discharge destinations, length of stay in acute hospitals and post-fracture duration were collected and studied as independent factors. Functional status at premorbid and community phase was measured by Modified Barthel Index (MBI). Data were collected by occupational therapists at acute admission to hospital after the fracture occurrence and during subjects' first attendance to FFDR after hospital discharge. Each subject's functional outcome was determined by the discrepancy in MBI score between the post-discharge status and premorbid status. Pearson's correlation was used to analyze the correlation between the independent factors and the functional

outcome. Factors that show association were further studied by regression analysis.

Results: 141 subjects aged from 61–101 (mean age: 84) were recruited in the study. The mean reduction in MBI among all subjects was 20. Age ($r = 0.336$, $p < 0.001$) and cognitive status in post-operative stage ($r = -0.377$, $p < 0.001$) are correlated with functional outcome. Both of them are significant predictors of functional outcome ($p < 0.005$).

Conclusion: Age and cognitive status are found to be related to post-fracture functional prognosis. Patients with older age or poor cognitive status tend to have a poorer functional prognosis after fragility hip fracture. This could help early identification of those with greater odds of poor functional outcome. Measures for better care planning like carer education and home modification could be initiated at the early stage of rehabilitation.

P362
VALIDATION OF THE OSTEOPOROSIS SELF-ASSESSMENT TOOL FOR ASIA AND TAIWAN FOR THE PREDICTION OF OSTEOPOROTIC FRACTURE RISK

C.-C. Li[1], L.-C. Ou[2], Y.-F. Chang[3], C.-S. Chang[3], Z.-J. Sun[4], T.-T. Cheng[5], C.-H. Wu[6]

[1]Institute of Allied Health Sciences, College of Medicine, National Cheng Kung Univ., Tainan, [2]Dept. of Family Medicine, Kaohsiung Medical Univ. Hospital, Kaohsiung, [3]Dept. of Family Medicine, National Cheng Kung Univ. Hospital, College of Medicine, National Cheng Kung Univ., Tainan, [4]Dept. of Family Medicine, National Cheng Kung Univ. Hospital Douliu Branch, College of Medicine, National Cheng Kung Univ., Yunlin, [5]Division of Rheumatology, Allergy, and Immunology, Dept. of Internal Medicine, Kaohsiung Chang Gung Memorial Hospital, Kaohsiung, [6]Institute of Gerontology, Medical College, National Cheng Kung Univ., Tainan, Taiwan

Objective: Patients with low bone density face an increased risk of future fractures and should be actively screened for mitigating this risk. Considering the inadequate feasibility of DXA, identifying high-risk groups through simple questionnaires for further bone density measurements is plausible. Currently, the commonly used tools for this purpose include the osteoporosis self-assessment tool (OSTA), the osteoporosis self-assessment tool for Taiwan (OSTAi) and the male osteoporosis self-assessment tool for Taiwan (MOSTAi). This study aimed to evaluate the sensitivity and specificity of these tools for predicting the 10-year risk of major osteoporotic fractures by comparing them with the FRAX score without BMD.

Methods: This study enrolled subjects surveyed from 2009 to 2010 in two communities in Taiwan. The OSTA, OSTAi and MOSTAi were calculated, and lumbar/hip BMD was measured via DXA, accordingly. The ability of cross-sectional comparisons to predict osteoporosis (T-score ≤ -2.5) was also analyzed. This study also linked to Taiwan's National Health Insurance Research Database to confirm major osteoporotic fracture data within 10 years to evaluate the cutoff values of OSTA (≤ -1), OSTAi (≤ -1), MOSTAi (≤ 11) and FRAX scores ($\geq 20\%$) for detecting future fractures in the real world.

Results: A total of 1976 participants were identified in the study. The participants were mostly female (52.8%), with a mean age of 65.4 y. In contrast with those of MOSTAi (sensitivity/specificity = 0.53/0.62), the OSTA (0.82/0.88) and OSTAi (0.86/0.89) have high sensitivities for detecting the risk of osteoporosis (T-score ≤ -2.5). In women, the OSTA (0.80) and OSTAi (0.86) have high sensitivities for determining the probability of major osteoporotic fractures at 10 years compared to the FRAX-MOF risk without BMD (0.35). However, the FRAX MOF risk without BMD (0.07) and MOSTAi (0.46) had low sensitivities in men.

Conclusion: In women, the necessity of bone density measurements and 10-y major osteoporotic fractures can be screened with either the OSTA or OSTAi, but the use of the MOSTAi needs to be further modified for men.

P363
CARDIOVASCULAR FUNCTION AND HEART RATE VARIABILITY PREDICT SARCOPENIA RISK IN THE ELDERLY

C.-F. Huang[1], P.-W. Hsu[2], Y.-L. Wang[3], S.-S. Lee[3], W.-H. Hsu[3], T.-Y. Mao[3]

[1]En Chu Kong Hospital, National Yang Ming Chiao Tung Univ., Chaoyang Univ. of Technology, Taichung, [2]Lo-Hsu Medical Foundation Lotung Pohai Hospital, Yilan County, [3]Chaoyang Univ. of Technology, Taichung, Taiwan

Objective: The identification and management of sarcopenia in older adults has become a major health issue. The aim of this project is to collect straightforward and noninvasive measurements of cardiovascular function, along with heart rate variability features, to create a model that can forecast the probability of developing sarcopenia.

Methods: The study was done in central Taiwan and had 418 participants (105 men, 313 females) with a mean age of 73.32 ± 8.81 y. The study incorporated a 3-min assessment of cardiovascular function and heart rate variability, along with a screening for sarcopenia utilizing metrics such as appendicular skeletal muscle index, grip strength, and walking speed as per the guidelines set by the Asian Working Group for Sarcopenia 2019 (AWGS 2019) (Fig. 1).

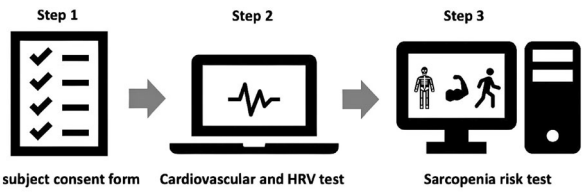


Figure 1. Flowchart of research process

Results: A significant correlation was seen between the appendicular skeletal muscle index, grip strength, walking speed, cardiovascular performance, and heart rate variability. The primary factors used to predict the likelihood of sarcopenia by logistic regression analysis were age, reflection index, dicrotic elasticity index, and high-frequency power. The analysis had an overall accuracy of 70.10%, with a sensitivity of 81.30% and a specificity of 54.07%.

Conclusion: This study showed that simple and noninvasive 3-min evaluations of cardiovascular function and heart rate variability can effectively forecast the probability of developing sarcopenia in older persons. This method can be employed to quickly detect the risk of sarcopenia in electronic equipment and prevent the development of sarcopenia in elderly individuals.

P364
ORAL BISPHOSPHONATES FOR ONE-YEAR POSTFRACTURE TREATMENT ARE ASSOCIATED WITH LOWERED LONG-TERM MORTALITY AND REFRACTURE: ADHERENCE MATTERS

C.-H. Wu[1], C.-C. Li[2], Y.-F. Chang[3], T.-W. Tai[4], S.-Y. Lin[5], C.-H. Chen[6]

[1]Institute of Gerontology, Medical College, National Cheng Kung Univ., Tainan, [2]Institute of Allied Health Sciences, College of Medicine, National Cheng Kung Univ., Tainan, [3]Dept. of Family Medicine, National Cheng Kung Univ. Hospital, College of Medicine, National Cheng Kung Univ., Tainan, [4]Dept. of Orthopedics, National Cheng Kung Univ. Hospital, College of Medicine, National Cheng Kung Univ., Tainan, [5]Orthopaedic Research Center, College of Medicine, Kaohsiung Medical Univ., Kaohsiung, [6]Dept. of Orthopedics, Kaohsiung Medical Univ. Hospital, Kaohsiung Medical Univ., Kaohsiung, Taiwan

Objective: Osteoporosis is a gradual condition that leads to the weakening of bones, increasing susceptibility to fractures, particularly among elderly people. A range of anti-osteoporosis medications are designed to mitigate fracture risk and even mortality. Studies have shown that the 1-y persistence rate for oral bisphosphonates is usually estimated to be less than 50%, while less than 50% of patients have a medication possession rate of $\geq$ 80%. Poor adherence to osteoporosis medications resulted in an approximately 50% reduction in the potential benefit observed in clinical trials. This real-world evidence study aimed to investigate the impact of one-year adherence to anti-osteoporosis medication on long-term mortality and major osteoporotic refractures.
Methods: The study focused on individuals diagnosed with osteoporosis who had experienced significant fractures leading to hospitalization, as identified in Taiwan's National Health Insurance Research Database spanning from 2008–2019. All the users of oral bisphosphonates (daily or weekly alendronate, weekly or monthly risedronate) within only one-year timeframe were selected and compared with the nonusers of any anti-osteoporosis medications. Survival outcomes were analyzed using Cox model analysis, adjusted with age, sex and Charlson comorbidity Index. Major osteoporotic refractures were censored from officially documented medical records.
Results: A total of 142,935 patients (14,070 users vs. 128,865 nonusers) were identified in the study from 2008–2019. The patients were mostly female (71.5%), and the mean age was 72 y. The follow-up duration was from 2009–2019. In general, the users of oral bisphosphonates exhibited a suboptimal medication possession ratio (MPR) (0.30 ± 0.24). Compared with nonusers, one-year oral bisphosphonate users seemed to have higher long-term mortality (HR 1.06, 95% CI 1.03–1.09), but those maintaining a superior MPR ($\geq$ 0.8) experienced a markedly reduced risk of mortality (HR 0.84, 95% CI 0.75–0.94) and major fracture (HR 0.69, 95% CI 0.64–0.74). However, an MPR between 0.5–0.8 had no significant impact on long-term mortality (HR 0.97, 95% CI 0.89–1.04), even users with a low MPR (< 0.5) had poor long-term mortality (HR 1.09, 95% CI 1.06–1.12).
Conclusion: One year of oral bisphosphonate use after fracture treatment with high adherence is associated with substantially lower long-term mortality and major osteoporotic refracture.

P365
ASSESSING DENOSUMAB'S ROLE IN PREVENTING BONE DENSITY LOSS IN OSTEOPOROSIS PATIENTS ON CORTICOSTEROIDS

C.-R. Li[1], H.-T. Lee[1], Y.-L. Deng[1]

[1]Taichung Veterans General Hospital, Taichung City, Taiwan

Objective: Osteoporosis frequently develops as a significant complication in patients undergoing corticosteroid therapy, which is recognized as a major drug-induced cause of this bone condition. This complication is particularly relevant for patients with rheumatologic and immunologic disorders, who often require long-term corticosteroid use. In existed literature, denosumab has shown promise, primarily by increasing bone density and reducing the incidence of fractures in patients with osteoporosis. This article aims to investigate the long-term effectiveness of denosumab in patients with osteoporosis who are also receiving corticosteroid therapy.
Methods: Between 2013–2022, a total of 390 patients with osteoporosis undergoing denosumab treatment for at least 18 months were enrolled in this study. Denosumab was administered as a subcutaneous injection of 60 mg every 6 months. The patients were categorized into two groups: those receiving corticosteroid treatment and those not receiving corticosteroid treatment. The primary outcomes assessed were BMD and TBS, measured at the lumbar spine and femoral neck. Additionally, secondary fracture events occurring within the 18-month follow-up period were also documented.
Results: After a follow-up period of at least 18 months, both the corticosteroid and non-corticosteroid groups exhibited improvements in the T-score of the lumbar spine. Specifically, the corticosteroid group showed a change from -2.1 ± 1.2 to -2.0 ± 1.3, which was statistically significant ($p < 0.001$). Similarly, the non-corticosteroid group demonstrated an improvement from -2.6 ± 1.2 to -2.4 ± 1.2 ($p = 0.003$). However, logistic regression analysis for secondary fractures revealed that corticosteroid administration remained a significant influencing factor (odds ratio: 1.69; 95% CI 1.11–2.56, $p = 0.014$), despite the administration of denosumab.
Conclusion: In our 18-month retrospective study, we noted a stabilization and slight improvement in BMD and TBS in corticosteroid-treated patients, suggesting denosumab's potential against corticosteroid-induced osteoporosis. Despite differences in secondary fractures between groups, these preliminary findings indicate denosumab's promise. Further long-term, comparative studies are essential to confirm its preventive efficacy in this demographic.

P366
ONE-YEAR ANTI-OSTEOPOROSIS MEDICATION THERAPY AND MUSCLE MASS CHANGES IN COMMUNITY-DWELLING OSTEOPOROTIC WOMEN

C.-Y. Wang[1], Y.-C. Lu[1], S.-H. Fu[2]

[1]National Center For Geriatrics and Welfare Research, National Health Research Institutes, [2]National Taiwan Univ. Hospital, Yunlin, Taiwan

Objective: Anti-osteoporosis medications (AOMs) offer proven benefits for bone health, yet their impact on muscle health is still under investigation. This study aims to investigate the impact of one of the AOMs, zoledronate, on muscle mass in osteoporotic women in rural communities.

Methods: This study was a subanalysis from the HOPE trail, a randomized controlled trial conducted in a rural community, aims to prevent disability through community-based integrated care intervention. In the present study, women aged 50 years and older diagnosed with osteoporosis were included. Those with a history of aAOM treatment were excluded. AOM used in this study was zoledronate. Participants were divided into two groups: a AOM treatment group (n = 136) and a control group (n = 134). Participants' appendicular skeletal muscle (ASM), handgrip strength (HS), the Short Physical Performance Battery (SPPB) assessment, and the Mini Nutritional Assessment (MNA) were measured at o, and 12 months.
Results: Participants had a mean age of 74.95 ± 7.42 in the AOM group, and 77.04 ± 8.64 in the control group. There were no significant differences in ASM, handgrip strength, SPPB score and the MNA score between treatment group and control group at baseline. Substantial enhancements in the physical condition were observed in both groups during the treatment period. At 12 months, the control group significantly improved in ASM (1.46 ± 3.77, $p < 0.001$) and HS (3.55 ± 8.51, $p < 0.001$), while the AOM group showed significant improvement in ASM (0.81 ± 4.33, $p = 0.036$) and handgrip strength 2.76 ± 8.48, $p < 0.001$). However, there were no statistically significant differences in the mean change between the treatment group and the control group in ASM (0.81 vs. 1.46, $p = 0.296$), handgrip strength (2.76 vs. 3.55, $p = 0.059$), SPPS score (0.42 vs. 1.08, $p = 0.302$), and MNA score (− 0.24 vs. − 0.35, $p = 0.406$), respectively.
Conclusion: In conclusion, community-dwelling osteoporotic women treated with AOM did not exhibit statistically significant differences in changes in ASM, handgrip strength, SPPS score, and MNA score in the first year.

P367
IMPACT OF CONTACT WITH THE ROYAL OSTEOPOROSIS SOCIETY SPECIALIST NURSE TELEPHONE HELPLINE ON CALLERS' INTENTION TO INITIATE OR CONTINUE OSTEOPOROSIS MEDICATION

D. A. Nelson[1], R. Stone[1], J. Thomson[1], E. Thomas[2]

[1]Royal Osteoporosis Society, Bath, UK, [2]Elizabeth Thomas Research, Stockholm, Sweden

Objective: To investigate the impact of contact with the Royal Osteoporosis Society's Osteoporosis Specialist Nurse Telephone Helpline (ROSHelp) on callers' intention to initiate or persist with osteoporosis treatment.
Methods: Data were gathered from a 2022 ROSHelp service audit. The ROSHelp annually handles over 13,000 enquiries from across the UK. Participants were recruited during helpline calls between 31 October and 2 December 2022, following a pilot study in 2021 that informed the research design. Validated surveys were administered electronically or by post 2 weeks after contact with ROSHelp to collect quantitative and qualitative data.
Results: Analysis included 273 returned surveys, constituting a 49% response rate. The majority of respondents were highly educated, affluent, white women aged over 60 y. 90% reported having osteoporosis, with 58% having experienced fracture(s). 66% of callers sought information regarding drug treatment, of whom 98% indicated improved understanding of their medication and its prescription rationale after the call. Additionally, 90% reported decreased concerns about treatment side effects, and 86% felt the call assisted them in taking decisions to start or continue treatment. Following the helpline interaction, 33% of those calling about medication opted against offered treatment, instead pursuing alternative treatment plans. Qualitative responses consistently highlighted callers' appreciation of specialist nurse expertise, empathetic support, and individualised assistance, with 10% citing barriers to accessing similar support through NHS sources.
Conclusion: The primary motivation for contacting ROSHelp is driven by a wish for greater comprehension of drug treatments, perhaps reflecting the complexity of therapies or current NHS pressures. Engagement with ROSHelp was found to enhance treatment understanding, alleviate concerns about side effects, and empower some participants to self-advocate for alternative therapeutic options. Interactions significantly influence callers' treatment perceptions in a positive manner, suggesting a role for ROSHelp in promoting medication adherence—bridging both information and treatment gaps, particularly for those facing barriers to accessing the information they need to make informed choices about treatment to reduce fracture risk.

P368
INFLUENCE OF HYPERHOMOCYSTEINEMIA AND ANTI-TNF TREATMENT ON TRABECULAR BONE SCORE AND BONE MASS DENSITY IN PATIENTS WITH RHEUMATOID ARTHRITIS

D. Anghel[1], O. -G. Petrache[1], I. -N. Nicolau[1], V. -C. Bojincă[2], A. Mihai[1]

[1]Dept. of Internal Medicine, "Dr. Carol Davila" Central Military Emergency Univ. Hospital, [2]Dept. of Internal Medicine, 'Sf. Maria' Clinical Hospital, Bucharest, Romania

Objective: To compare the effects of anti TNF-α agents (adalimumab, etanercept and infliximab) on TBS and BMD in patients diagnosed with rheumatoid arthritis (RA) and hyperhomocysteinemia.
Methods: 34 patients with RA were enrolled in this retrospective observational study. The data was collected chronologically (February 2022-February 2023) from the hospitalized patients in Central Military Emergency Hospital "Dr. Carol Davila", Dept. of Medicine 2, who were diagnosed with RA, and were prescribed biologic treatment and had undergone osteodensitometry (DXA). Patients with osteopenia were prescribed alfacalcidol and patients with osteoporosis were prescribed risedronate sodium, vitamin D and calcium lactate. Inclusion criteria: patients > 18 years old, diagnosed with RA (according ACR/EULAR criteria 2010). Exclusion criteria: history of anti-osteoporotic treatment, history of biological treatment, secondary causes of osteoporosis, other rheumatic inflammatory diseases than RA. Several parameters (TBS, DMO, homocysteine—HCY and vitamin D serum levels) were evaluated at baseline and after 12 months.
Results: We observed that treatment with anti TNF therapy had a positive influence on TBS. We found a significant correlation between TBS and Adalimumab therapy after 12 months ($p = 0.0003$). However, we found no significant correlation in patients treated with etanercept ($p = 0.06$) or infliximab ($p = 0.146$). A significant correlation was observed between TBS and HCY in both adalimumab ($p = 0.003$) and etanercept ($p = 0.004$) groups after 12 months of treatment. No significant correlation was found in the infliximab treated group ($p = 0.185$). Regarding BMD and anti TNF treatment, significant correlation was observed in the adalimumab group ($p = 0.0002$), in the infliximab group ($p = 0.0001$) and etanercept ($p < 0.0001$) group after 12 months.
Conclusion: Adalimumab improved BMD and TBS after 12 months of treatment. Hyperhomocysteinemia had a negative influence on TBS and BMD. It is important to evaluate and reduce homocysteine levels in order to prevent bone fragility.

P369
CHATGPT AMONG TUNISIAN PHYSICIANS: ARE RHEUMATOLOGISTS MORE ENGAGED?

W. Lahmar[1], D. Ben Nessib[1], H. Ferjani[1], F. Majdoub[1], L. Kharrat[1], D. Kaffel[1], K. Maatallah[1], W. Hamdi[1]

[1]Kassab's Institute of Orthopedics, Manouba, Tunisia

Objective: The emergence of sophisticated language models, such as Chat Generative Pre-Trained Transformer (ChatGPT), has generated curiosity across diverse domains, including the field of medicine. Developed by OpenAI, ChatGPT is an artificial intelligence (AI) driven chatbot utilizing Language Processing Models. The aim of this study was to explore the use of ChatGPT by the Tunisian physicians and more specifically the Tunisian rheumatologists.
Methods: This cross-sectional study (online questionnaire survey) was conducted over a 2-week period amongst rheumatologists and other specialty clinicians. An online questionnaire was developed, with multiple choice, using the Google Forms platform.
Results: The survey was completed by 174 physicians. The predominant responses were received from the family doctors (n = 43, 24.7%) followed by rheumatologists (n = 35, 20.1%). The mean age of participants was 30.29 ± 3.88 y [24–49], with an average experience of 4.28 ± 3 y [1–23]. Among them, 100 (57.5%) were residents in training, 45 (25.9) were university hospital doctors, 16 (9.2%) were public health doctors and 13 (7.5%) worked in the private sector. The majority of clinicians (n = 120, 69%) admitted being aware of ChatGPT and used it in their professional practice, including internal medicine (n = 9, 75%), family medicine (n = 36, 84%), and psychiatrists (n = 8, 89%). ChatGPT was used by physicians for medical writing, academic purposes, and clinical domain in 51% (n = 88), 10% (n = 18) and 13% (n = 23) of the cases, respectively. Most of rheumatologists (n = 23, 65%) used ChatGPT and some hesitated to use it due to factors like not feeling the need (n = 6), lacking experience (n = 3), and concerns about data reliability (n = 4). For those using AI, 17 admitted to employing ChatGPT for medical writing, and thus for grammar and spelling correction (n = 9), translation (n = 11), idea generation (n = 8), paraphrasing (n = 12), reference generation (n = 2), results interpretation (n = 1), and to enhance general writing style (n = 17). Only one person utilized ChatGPT for academic activities, primarily for evaluating pedagogical techniques and preparing medical teaching courses. In clinical activities related to diagnosis, monitoring, or therapy, only four rheumatologists used ChatGPT. Two considered it for etiological discussions, two for listing therapeutic alternatives, and one for aiding in follow-up and therapeutic decision-making. The majority, 23 individuals, admitted using ChatGPT with colleagues, 4 with students, 5 with superiors, 2 with scientific work evaluators, and 3 with patients. Respondents expressed concerns about ChatGPT's reliability (average 1.97 ± 0.9 [0–3]) on the Likert scale. Data confidentiality when using ChatGPT received an average of 2.27 ± 1.4 [0–4], while concerns about potential copyright law violations were evaluated at 2.15 ± 1.4 [0–4] by rheumatologists. When comparing rheumatologists to other clinicians, we found that they were similar in all other applications, including medical writing, academic domain, and clinical and therapeutic use. However, the rheumatologist users of ChatGPT were statistically younger (R: 29.11 + 3.7 years vs. NR: 30.59 + 3.87 y, p = 0.043) and used it for a longer time (R: 9.57 + 6.8 months vs. NR: 7.19 + 4.31 months, p = 0.045) than other clinicians.
Conclusion: In this exploration of ChatGPT's adoption among Tunisian physicians, particularly rheumatologists, we noticed a significant awareness and utilization of this AI-driven tool in medical practices.

P370
PATIENT DISSATISFACTION WITH CARE AMONG INDIVIDUALS UNDERGOING CONSERVATIVE TREATMENT FOR KNEE OSTEOARTHRITIS

D. Ben Nessib[1], W. Lahmar[1], H. Chaouachi[1], H. Ferjani[1], L. Kharrat[1], F. Majdoub[1], D. Kaffel[1], K. Maatallah[1], W. Hamdi[1]

[1]Kassab's Institute of Orthopedics, Manouba, Tunisia

Objective: Knee osteoarthritis (KOA) is the most common musculoskeletal disease. It has been suggested that conservative management of OA may be difficult and sometimes unsatisfying for both physicians and patients. To improve quality of care for KOA patients, quality indicator should be set to develop an evidence-based guidelines. We aimed to investigate the frequency of dissatisfaction in patients with KOA in our center and determine the associated factors.
Methods: This cross-sectional study included patients followed for KOA in a rheumatology department. Sociodemographic features (age, gender, educational level, socioeconomic status, social coverage), and clinical characteristics of KOA were collected. We asked patients about their satisfaction with the care for KOA provided in our center. Patients were categorized into two groups: Group 1 (G1): unsatisfied and Group 2 (G2): satisfied with care.
Results: A total of 87 patients were included with a mean age of 59.5 + 10.26 y [34–87], the sex ratio (female/male) was 11.42. Dissatisfaction with care was detected in 57 patients (66%). A notable female gender predominance was observed in both groups, but with no statistical difference (G1: 54(94%) vs. G2: 26(87%); p = 0.182). Patients in G1 were statistically older (G1: 61.02 ± 10.39 y vs. G2: .77 ± 9.5 y, p = 0.048). BMI differences between the two groups were observed, with no statistical significance (G1: 31.22 ± 6.7 vs. G2: 29.3 ± 6.2, p = 0.225). Lower educational level (G1: 44(77%) vs. G2: 22(74%), p = 0.689), lower socioeconomic status (G1: 26(46%) vs. G2: 18(60%), p = 0.202), and absence of social coverage (G1:30(53%) vs. 20(67%), p = 0.208) showed no significant differences between the two groups. Patients in G1 reported a higher pain intensity (5.91 ± 1.6) compared to G2 (4.63 ± 1.7), demonstrating a significant association with dissatisfaction (p = 0.001). Bilateral KOA (G1: 50(87%) vs G2:19(63%), p = 0.008) and bicompartmental and tricompartmental locations were also found to contribute significantly to dissatisfaction (G1: 37(65%) vs. G2: 12(40%), p = 0.026).While a delayed medical intervention (G1:2.05 ± 1.8 y vs. G2: 1.5 ± 1.6 y, p = 0.175) and therapeutic noncompliance (G1:14 (25%) vs. G2:1 (3%), p = 0.013) played a more substantial role in dissatisfaction, irregular follow-up (G1: 4(7%) vs. G2: 0, p = 0.137) and the absence of therapeutic education were not relevant factors (G1:10 (17%) vs. G2:2 (6%), p = 0.162). An indication for a total knee arthroplasty revealed a notable distinction, with 12% in G1 having an indication compared to none in G2 (p = 0.045).
Conclusion: Our study on patient dissatisfaction with conservative KOA treatment underscores the importance of personalized approaches based on factors like age, gender, and specific health conditions. We found that issues like delayed medical intervention and ensuring treatment compliance are crucial for overall satisfaction with KOA management.

P371
KNEE OSTEOARTHRITIS: EXPLORING THE RELATIONSHIP OF PAIN, FUNCTIONAL IMPAIREMENT WITH COMPARTMENTAL INVOLVEMENT

D. Ben Nessib[1], W. Lahmar[1], H. Chaouachi[1], H. Ferjani[1], L. Kharrat[1], F. Majdoub[1], D. Kaffel[1], K. Maatallah[1], W. Hamdi[1]

[1]Kassab's Institute of Orthopedics, Manouba, Tunisia

Objective: Knee osteoarthritis (KOA) is a prevalent musculoskeletal condition that significantly impairs patients' quality of life. Understanding the clinical characteristics and factors influencing functional outcomes in KOA is crucial for optimizing patient care. The study aimed to explore the relationship between clinical impact including knee pain and functional impairment and specific compartment of the knees in patients followed for KOA.
Methods:A cross-sectional study including patients followed for KOA. Clinical and radiological characteristics of KOA were collected. Pain intensity was assessed by the visual analogue scale (VAS). Functional impairment was assessed by the short form of the Knee Injury and Osteoarthritis Outcome Score (KOOS-PS) with a score ranging from 0 (no difficulty) to 100 (extreme difficulty).
Results: A total of 87 patients were included with a mean age of 59.5 ± 10.26 y [34–87], the sex ratio (female/male) was 11.42. The mean BMI was 30.58 ± 6.61. KOA was femoro-tibial in 40 cases (46%) and femoro-patellar in 18 patients (21%), the internal compartment was affected in 34 (39%) cases, a tricompartmental involvement was present in 29 patients (33%), and a bilateral KOA was found in 79% of cases (n = 69). Mean duration of follow-up of the disease was 4.38 ± 3 y. The mean VAS pain was 5.47 ± 1.75 [2–9]. The mean KOOS-PS score was 67 ± 14.76 [28–89]. A positive and significant correlation between the KOOS and VAS pain was found (r: 0.72; $p < 0.001$). There was no correlation between the KOOS and the duration of evolution (p = 0.43). The mean KOOS was significantly higher in patients with medial femoro-tibial involvement, either coexisting with lateral compartment involvement or no, compared to those with femoro-patellar compartment involvement alone (70.34 ± 12.71 vs. 63.98 ± 12.71, p = 0.005). However, pain intensity was notably higher in cases with femoro-patellar compartment involvement (5.08 ± 1.6 vs. 6.16 ± 1.63, p = 0.046). Patients exhibited comparable KOOS scores in the presence of bilateral involvement (70.26 ± 13.47 vs. 64.63 ± 15.38, p = 0.078), but reported higher pain levels (5.84 ± 1.79 vs. 5 ± 1.59, p = 0.026).
Conclusion: Pain intensity demonstrated a significant correlation with functional impairment, emphasizing the subjective experience of patients. The compartmental involvement analysis revealed nuanced associations, highlighting the heterogeneity of KOA presentations.

P372
FEAR OF FALLING IS ASSOCIATED WITH GAIT SPEED AFTER 3 MONTHS OF HOSPITAL DISCHARGE IN OLDER ADULTS WITH HIP FRACTURE SURGERY

M. Peres Ueno[1], L. L. C. Capato[1], J. Faria Junior[1], V. Sanchez Teixeira[1], A. S. F. Sundin Foltran[2], G. H. P. Pelinson[2], C. Pereira da Silva Herrero[3], D. Carvalho de Abreu[4]

[1]Ribeirão Preto Medical School, Univ. of São Paulo, [2]Dept. of Orthopedics and Hip Surgery, Santa Casa de Misericórdia de Ribeirão Preto, [3]Dept. of Orthopedics and Anesthesiology at the Ribeirão Preto Medical School, Univ. of São Paulo, [4]Dept. of Health Sciences, Ribeirão Preto Medical School, Univ. of São Paulo, Ribeirao Preto, Brazil

Objective: Fragility hip fracture is associated with osteoporosis, and hip fracture is the most serious fracture. After a hip fracture, patients commonly exhibit very low gait speeds. While various factors have been shown to influence the patients' functional outcome, this study aimed to provide new insights related to the influence of self-perception on the gait speed of older Brazilian adults three months after hip fracture surgery.
Methods: A prospective cohort study was undertaken, including twenty participants who were hospitalized in a public hospital due to a proximal femur fracture. Participants were followed from hospital admission until 3 months after discharge. Along with clinical and surgical variables, questionnaires of pre-fracture functional capacity (New Mobility Score), balance self-perception, and fear of falling were administered. Also, handgrip strength was assessed. Gait speed was evaluated 3 months after surgery by asking participants to walk a 10-m distance at their usual speed, with the time recorded over 5 central meters of the route. Linear regression analysis was used to determine a statistical model that best predicted gait speed (dependent variable), adjusted for age and sex.
Results: Of the 20 participants evaluated (mean age of 78 y), 75% were women, 50% had a transtrochanteric femoral fracture, and 50% underwent arthroplasty of the hip. The average length of hospital stay was 5 d. Fear of falling ($\beta = -0.51$; p = 0.037) explained 34% of the usual gait speed after 3 months of hospital discharge. New mobility score ($\beta = 0.47$; p = 0,030) and the handgrip strength ($\beta = 0.59$; p = 0.029) explained 35% of gait speed.
Conclusion: These preliminary findings may have important implications for clinical care in the acute scenario. The fear of falling may be an emerging prognostic factor for functional recovery, so future research may target patients who are afraid of falling to optimize the post-intervention management of high-risk individuals.

P373
BEYOND MUSCLE PAIN IN FIBROMYALGIA AND MYOFASCIAL PAIN SYNDROME

D. Cepoi[1], L. Groppa[1], E. Russu[1]

[1]State Univ. of Medicine and Pharmacy "Nicolae Testemitanu", Chisinau, Moldova

Objective: To compare the frequency of symptoms classically reported in fibromyalgia (FM) in the groups of FM and myofascial pain syndrome (MFS).
Methods: A total number of 160 patients with chronic musculoskeletal pain were examined and assigned to fibromyalgia and myofascial syndrome groups accordingly. The subjects were asked questions based on a standardized questionnaire.
Results: Presented in Table 1.

Table 1. Occurrence of symptoms other than muscle pain in FM and MFS groups.

Symptom	FM (M±SD)	MFS (M±SD)	p
Fatigue	0,85000±0,35932	0,66250±0,47584	0,010334
Sleep disorders	0,68750±0,46644	0,56250±0,49921	0,105142
Joint pain	0,83750±0,37124	0,68750±0,46644	0,013363
Headache	0,82500±0,38236	0,62500±0,48718	0,005342
Restless leg syndrome	0,52500±0,50253	0,43750±0,49921	0,299630
Paresthesia	0,81250±0,39277	0,71250±0,45545	0,131424
Memory problems	0,78750±0,41166	0,47500±0,50253	0,000046
Concentration issues	0,55000±0,50063	0,32500±0,47133	0,005900
Anxiety	0,83750±0,37124	0,53750±0,50174	0,000122
Depression	0,56250±0,49921	0,32500±0,47133	0,0039
Irritable bowel syndrome	0,50000±0,50315	0,12500±0,33281	0,000000
Interstitial cystitis	0,41250±0,49539	0,10000±0,30189	0,000016
Cold intolerance	0,63750±0,48376	0,32500±0,47133	0,000046

Conclusion: Patients with FM and MFS frequently associate non-muscular pain symptoms. Sleep disorders, restless leg syndrome, paresthesia, fatigue, joint pain, and headaches are frequently reported by both patients with FM and MFS. Symptoms that showed a higher

specificity for FM were Irritable bowel syndrome, Interstitial Cystitis, and Intolerance to cold.

P374
HIGHER LEVELS OF HIGH-DENSITY LIPOPROTEIN CHOLESTEROL ARE ASSOCIATED WITH LOWER BONE MINERAL DENSITY IN OLDER ADULTS

D. Fitzpatrick[1], E. Laird[2], R. Lannon[3], M. Ward[4], L. Hoey[4], C. F. Hughes[4], J. J. Strain[4], C. Cunningham[4], A. M. Molloy[4], H. Mc Nulty[4], K. Mc Carroll[1]

[1]Mercer's Institute for Research on Ageing, St James's Hospital, Dublin, Ireland, [2]Dept. of Nutrition, Atlantic Technological Univ., Sligo, Ireland, [3]Mercer's Institute for Research on Ageing, Dublin, Ireland, [4]Nutrition Innovation Centre for Food and Health, Univ. of Ulster, Coleraine, UK

Objective: Lipids appear to play an important role in bone metabolism. However, there are few studies examining the relationship between high density lipoprotein cholesterol (HDL), low density lipoprotein cholesterol (LDL), triglycerides and BMD with inconsistent results identified.
Methods: Participants were from the Trinity-Ulster-Department of Agriculture (TUDA) study, a large cross-sectional cohort of Irish adults aged $\geq$ 60 y. We excluded patients with a known diagnosis of osteoporosis and those on therapies for osteoporosis as well as patients on statins. We examined the association between HDL, LDL and triglycerides and BMD (as measured by DXA) at the neck of femur, total hip and lumbar spine controlling for age, sex, BMI, timed up and go test, 25(OH)D, eGFR, PTH levels, smoking, daily dairy intake, alcohol consumption, type 2 diabetes mellitus, current or past steroid exposure, and loop and thiazide diuretics.
Results: There were 871 participants who met the inclusion/exclusion criteria with a mean age of 70.0 $\pm$ years, of whom 62.5% were female. BMD at the total hip was negatively associated with HDL, which remained significant after multivariate regression ($\beta = -0.04$, $p = 0.003$). No significant association was found between HDL and lumbar spine BMD ($\beta = -0.03$, $p = 0.09$). We also did not find any significant association between LDL or triglycerides and BMD at any site.
Conclusion: This study demonstrated that HDL was an independent negative predictor of BMD at the total hip as identified elsewhere. Other research suggests this association may be mediated by genetic and dietary factors, sex hormone profiles as well as a potential direct interaction between HDL and bone metabolism. Further investigation to elucidate the factors underpinning this relationship is warranted.

P375
DIABETES ASSOCIATED WITH LOWER BONE TURNOVER MARKERS: A MECHANISM FOR INCREASED BONE MINERAL DENSITY IN DIABETICS

D. Fitzpatrick[1], R. Lannon[2], E. Laird[3], M. Ward[4], L. Hoey[4], C. F. Hughes[4], J. J. Strain[4], C. Cunningham[4], H. Mc Nulty[4], A. M. Molloy[4], K. Mc Carroll[1]

[1]Mercer's Institute for Research on Ageing, St James's Hospital, Dublin, Ireland, [2]Mercer's Institute for Research on Ageing, Dublin, Ireland, [3]Dept. of Nutrition, Atlantic Technological Univ., Sligo, Ireland, [4]Nutrition Innovation Centre for Food and Health, Univ. of Ulster, Coleraine, UK

Objective: Diabetes is associated with increased BMD though paradoxically an increased risk of fracture. Lower bone turnover markers (BTM) in diabetics are identified in some studies and may in part explain this relationship. We aimed to: (1) explore BTM in older adults with and without diabetes and (2) ascertain if lower BTM are associated with higher BMD.
Methods: Study participants were $\geq$ 60 y from a large cross-sectional study of Irish adults. Those with osteoporosis and/or on antiresorptives or anabolic medications were excluded. Diabetes was defined by self-report, use of diabetic medications or HbA1c $\geq$ 6.5%. ANCOVA was used to compare mean levels of bone specific alkaline phosphatase (BAP), CTX, osteocalcin and TRAP5b in patients with and without diabetes controlling for age, sex, BMI, estimated glomerular filtration rate, 25-hydroxyvitamin D, timed up and go, long-term or current steroid use, alcohol use, smoking, thiazide and loop diuretic use. The relationship between BTM and BMD (measured by DXA) at the lumbar spine and total hip were also explored in diabetics adjusting for the same covariates.
Results: Of the 2127 participants 17.7% (n = 375) had diabetes. The mean age of those with and without diabetes was 69.8 y, while diabetics were more likely to be male (54.7 vs. 40.6%, $p < 0.001$). Diabetics vs. non-diabetics had lower mean osteocalcin and CTX which remained significant after multivariate adjustment (osteocalcin: 12.2 vs. 15.9 ng/ml, $p < 0.001$), (CTX: 0.273 vs. 0.330 ng/ml, $p < 0.001$). No association was found between diabetes status and BAP or TRAP5b. In diabetics, both lower CTX and osteocalcin were associated with higher BMD at the spine ($p < 0.001$) and the hip ($p < 0.001$).
Conclusion: Patients with diabetes vs. non-diabetics had significantly lower CTX and osteocalcin as reported elsewhere. Furthermore, in diabetics CTX and osteocalcin were negatively associated with BMD. Lower CTX in diabetics may indicate reduced bone resorption, which could account for higher BMD. However, the relationship with osteocalcin may be more complex, as it appears to influence insulin secretion. Further research to understand how these changes in BTM may affect bone quality and fracture risk is required.

P376
IMPLICATIONS OF THORACIC MUSCLE INDEX AND CALF CIRCUMFERENCE IN SARCOPENIA DIAGNOSIS FOR OSTEOPOROTIC INDIVIDUALS POST-VERTEBROPLASTY

L. Fangying[1], D. Hong[1], Z. Liwei[1], Y. Citing[1]

[1]Orthopedic Dept., Taizhou Hospital of Zhejiang Province, Linhai, China

Objective: Diagnosing sarcopenia in elderly osteoporotic patients with vertebral fractures is challenging due to the traditional focus on extremity muscle mass rather than back muscle. Furthermore, back pain from fractures hampers physical function assessment. This study aimed to compare thoracic muscle cross-sectional area (T12 skeletal muscle index, T SMI) measured by CT and manually measured calf circumference (CC) for sarcopenia diagnosis in these patients.
Methods: This study involved patients with fragile thoracolumbar fractures who underwent vertebroplasty at two tertiary hospitals in southeastern China from January 2022 to June 2023. T12 SMI and CC were evaluated as indicators of muscle mass to diagnose sarcopenia. Postoperative variables, such as the visual analogue scale (VAS), Short Physical Performance Battery (SPPB), hospital stay duration, and vertebral refracture rate within 6 months, were compared between sarcopenia and non-sarcopenia groups diagnosed by the two methods.
Results: Out of 149 participants, the diagnostic concordance between T12 SMI and CC was 79.9%. The sarcopenia prevalence was 46.1% and 52.3% for T12 SMI and CC, respectively. CC's AUC was 0.735. Significant differences in diagnostic outcomes between the two methods were associated with sex ($p = 0.043$), BMI ($p < 0.001$), abdominal circumference (AC) ($p = 0.038$), and diabetes presence ($p = 0.043$). Binary stepwise regression analysis identified BMI

(p = 0.01) as the primary factor influencing CC diagnostic accuracy. T12 SMI-diagnosed sarcopenia significantly correlated with refracture (p = 0.033), whereas CC-diagnosed sarcopenia was significantly related to postoperative SPPB scores (p = 0.002).
Conclusion: CC may be unsuitable for diagnosing sarcopenia in obese osteoporotic patients. T12 SMI proves more predictive for refracture in patients with thoracolumbar fractures, while CC is more related to postoperative functional status.

P377
PAIN RELIEF AND IMPROVED QUALITY OF LIFE AFTER SWITCHING ORAL BIPHOSPONATE TREATMENT TO DENOSUMAB IN PATIENT WITH OSTEOPOROTIC MULTIPLE VERTEBRAL FRACTURES

D. Jovanovska-Jordanovski[1], V. Dimitrioski[1], S. Lazarevska[2], M. Jakimova[3], I. Bozhinovska[4]

[1]PHI Health Center Skopje, Polyclinic Jane Sandanski, [2]Center of Physical and Kinesitherapy Laser Med, [3]Private Orthopaedic Practise OrtoPlusPed, [4]Acibadem Sistina Hospital, Skopje, North Macedonia

Osteoporosis is a silent metabolic bone condition associated with natural loss of bone density with ageing. Vertebral body compression fractures are prevalent in older patients. Sometimes efficacy of the long term oral bisphosphonate treatment is diminished. Denosumab is alternative treatment for osteoporosis. This case report aimed to describe the beneficial effects of Denosumab in osteoporotic treatment as well as pain relief in patient with osteoporotic multiple vertebral fractures. After a long term therapy with oral bisphosphonates through comparison of the past and current DXA scans, X rays and CT findings we concluded that switching to Denosumab was a reasonable way for treatment of this patient.
Casereport: 71 years old female patient, 146.0 cm height, weight 60 kg, menopause at 46 y, + familiar anamnesis (mother), history of chronic back pain. A physical examination included labs, X-rays, CT and DXA scans. X-rays and CT findings of the thoracolumbar spine showed kyphoscoliosis, degenerative spondylarthrosis and polydiscopathy, compressive body fractures from Th9-L4.This patient after long term treatment with oral bisphosphonates was switched to denosumab. Comparing control labs and DXA scan results (f2023) T-score L1 2.4/L2 − 1.9/L3 − 0.3/L4 − 0.1/LF total T-score − 1.8 (wards − 2.8)/RF total T-score − 1.8 (wards − 2.8) showed relief of low back pain and improvement of quality of life after two administrated doses of denosumab beside analgesic therapy and brace support.
Conclusion: Denosumab has beneficial effects in osteoporotic treatment as well as pain relief and improved quality of life in patient with osteoporotic multiple vertebral fractures.

P378
MID-TERM RESULTS OF ARTHRODESIS OF THE 1ST METATARSOPHALANGEAL JOINT AND RESECTION ARTHROPLASTY OF THE HEADS OF THE LESSER METATARSAL BONES IN COMPARISON WITH JOINT-PRESERVING OPERATIONS ON THE FOREFOOT IN PATIENTS WITH RHEUMATIC DISEASES

D. Kapitonov[1], E. Bialik[1], L. Alekseeva[1], S. Makarov[1], M. Makarov[1], V. Bialik[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To compare the results of the Clayton-Hoffman (arthrodesis of the 1st metatarsophalangeal joint and resection arthroplasty of the heads of the lesser metatarsal bones) operation (CH) and joint-preserving operations (JP) on the forefoot in patients with rheumatic diseases (RD).
Methods: 143 patients with RD were included. The patients were randomized into 2 groups: the control group underwent CH surgery (70), the main group underwent JP (73) on the forefoot. To assess the outcome, we studied the change in pain intensity on the visual analogue scale (VAS), as well as the functional status of the foot on the AO FAS scale (for toes 1 and 2–5) before and 3 y after surgery. The results obtained were assessed by the dynamics of pain intensity according to VAS (0–10 mm—excellent; 11–30 mm—good; 31–40—satisfactory; $\geq$ 40 mm—unsatisfactory) and changes in the functional state of fingers 1 and 2–5 according to the AO FAS scale (91–100—excellent; 81–90—good; 71–80—satisfactory; < 70—unsatisfactory).
Results: The average value of pain intensity according to VAS before surgery was 62 ± 3 points (both groups), after—CH-10 ± 5, JP—11 ± 3 points, on the AO FAS scale for 1 finger 42 ± 3, for 2–5 fingers—47 ± 7 before operations, after CH—81 ± 3, JP—79 ± 2 for 1 finger and CH—80 ± 2, JP-70 ± 5 for 2–5 fingers. Three years after the operation, the results were as follows: according to VAS—Excellent—126 (CH-67; JP-59), good—6 (CH-5, JP-1) satisfactory -2 (CH-1, JP-1), unsatisfactory—9 (CH-5, JP-4). According to the AO FAS scale (1)—Excellent—34 (CH-16, JP-18), good—74 (CH-38, JP-36), satisfactory—16 (CH-14, JP-2), unsatisfactory—18 (CH-8, JP-10). On the AO FAS scale (2–5)—Excellent—34 (CH-24, JP-10), good—53 (CH-29, JP-24), satisfactory—20 (CH-16, JP-4), unsatisfactory—14 (CH-9, JP-11).
Conclusion: Performing joint-preserving operations on the forefoot in a group of patients with RD can improve functional indicators on the AO FAS scale (for 1 and 2–5 MCP joints) and reduce pain intensity according to VAS, increasing the quality of life of patients.

P379
CANADIAN FIRST NATIONS CARE GAP: OSTEOPOROSIS HEALTH CARE PROVIDER SURVEY HIGHLIGHTS

D. Kendler[1], J. Ybanez[2], S. Huang[3], R. Kherani[3]

[1]UBC Division of Endocrinology, [2]Prohealth Clinical Research, [3]UBC Division of Rheumatology, Vancouver, Canada

Objective: First Nations people have a high incidence of inflammatory arthritis. Inflammatory arthritis is a strong risk factor for osteoporosis. Although there are no data for British Columbia (BC), Canada, in other First Nations communities, studies have indicated increased osteoporosis and fracture risk amongst First Nations people. We developed a questionnaire to identify the osteoporosis perceptions and needs of health care providers (HCP) in First Nations communities in northern BC.
Methods: A literature review identified information on the prevalence, risk factors, and management of osteoporosis in Canadian First Nations populations. A questionnaire was created to assess the knowledge of physicians and nurses in each First Nations community. Questionnaires were accumulated through paper and electronic formats.
Results: Questionnaires were distributed to HCP in First Nations communities in conjunction with travelling rheumatology clinics in coastal BC communities of Heiltsuk Nation, Bella Bella, BC central coast; Nuxalk Nation, Bella Coola, BC central coast; and Nisga'a Nation, Nass Valley, BC northern coast. Of 18 returned questionnaires, 7 were from doctors and the remainder from nurses. Over half (52%) reported that they received no specific education on osteoporosis. The majority (73%) indicated that they see osteoporosis occasionally or frequently; however, 92% encountered fractures occasionally or frequently. Since fractures are frequent indicators of osteoporosis and future fracture risk, the absence of an osteoporosis diagnosis may indicate a lack of awareness of this risk. Over half

(57%) of respondents rarely or never refer patients for bone density. The most common perceived barriers to providing osteoporosis care include geographic (67%), mistrust (56%), financial (39%), and lack of access to required services (39%). 94% of respondents agreed or strongly agreed that enhanced access to osteoporosis care is required for First Nations communities in BC.

Conclusion: Our survey provides valuable insights into the osteoporosis-related needs of HCP in First Nations northern BC populations. Most significantly, there was overwhelming agreement amongst respondents of the need for strategies to enhance osteoporosis care in their communities. These data will pave the way for targeted interventions and improved osteoporosis healthcare practices for these communities.

P380
ASSOCIATION OF DIFFERENT DYSGLYCEMIA GROUPS WITH INCIDENT BONE FRACTURES IN MEN AND WOMEN: TEHRAN LIPID AND GLUCOSE STUDY

D. Khalili[1], H. Farzad[1], M. Tohidi[1], F. Azizi[2]

[1]Prevention of Metabolic Disorders Research Center, Research Institute for Endocrine Sciences, Shahid Beheshti Univ. of Medical Sciences, [2]Endocrine Research Center, Research Institute for Endocrine Sciences, Shahid Beheshti Univ. of Medical Sciences, Tehran, Iran

Objective: To investigate the association between different dysglycemia groups and long-term hospitalization-required incident fractures in adults, men and women aged $\geq$ 50 years old with more possible osteoporosis.

Methods: A total of 3309 participants (1711 women) were followed up for a median of 18 y. The incidence rate per 1000 person-year was calculated and a multivariate Cox proportional hazard model was applied to assess the hazard ratio (HR) of fracture for categories of impaired fasting glucose (IFG), impaired glucose tolerance (IGT), both IFG/IGT, newly diagnosed diabetes mellitus (NDM) and previously known diabetes (KDM). Covariates included age, BMI, waist circumference, smoking, hypertension, and steroid medications.

Results: Incident fracture was observed in 201 cases (114 women). The incidence rate was 3.4 (95% CI 2.8–4.2) and 4.3 (3.6–5.1) per 1000 person-year in men and women respectively. None of the categories of dysglycemia was associated with an increased risk of fracture in both men and women, meanwhile, KDM in men (HR = 0.20, 95% CI 0.05–0.84) and IGT in women (HR = 0.42, 0.17–1.06) were significantly associated with a lower risk of fracture. Among covariates, BMI (in kg/m^2) was associated with decreased risk (HR = 0.88, 0.82–0.95), waist circumference (in cm) with increased risk (HR = 1.05, 1.02–1.08) and also current smoking with increased risk (HR = 2.5, 1.0–6.3) in women.

Conclusion: In our population, dysglycemia was associated with a lower fracture risk with different patterns in men and women.

P381
JOINT INVOLVEMENT IN SYSTEMIC LUPUS ERYTHEMATOSUS: PREVALENCE AND SEROLOGICAL ASSOCIATIONS

O. Iaremenko[1], D. Koliadenko[1], K. Iaremenko[2]

[1]Bogomolets National Medical Univ., [2]Alexander Clinical Hospital, Kyiv, Ukraine

Objective: To investigate the prevalence and serological associations of joint involvement in a cohort of Ukrainian patients (pts) with systemic lupus erythematosus (SLE).

Methods: A total of 376 SLE pts (aged 36 (26–48) y; 86.4% females) were enrolled in the cross-sectional study. Pts were thoroughly assessed using SLE Disease Activity Index 2000 (SLEDAI-2K). Joint involvement was defined as arthralgias (mostly polyarthralgias) and/or arthritis detected by ultrasound or MRI, aligning chronologically with the onset of other SLE symptoms and lacking alternative causes. Laboratory assessments included traditional inflammatory markers (erythrocyte sedimentation rate (ESR), C-reactive protein (CRP)) and specific SLE autoantibodies. Additionally, 79 SLE pts were tested for serum levels of high-sensitivity CRP (hs-CRP), anti-CRP antibodies, IL-6, IL-10, and presepsin. Mann–Whitney test was used for statistical analysis.

Results: Joint involvement was observed in 316 (84%) of SLE pts. Disease activity index was significantly higher in pts with articular manifestations compared to those without such symptoms (SLEDAI-2K 11 (6–16) points vs. 8 (4–14) points, p = 0.01). SLE pts with joint involvement exhibited higher frequency of anti-double stranded DNA antibodies (anti-dsDNA) positivity (65 vs. 46%, p = 0.03), with no differences noted in other SLE autoantibodies. There were no significant variations between SLE pts with and without articular manifestations regarding levels of ESR (22 (11–41) vs. 22 (13–42) mm/h, p = 0.97), CRP (6 (0–24) vs. 6 (0–48) mg/L, p = 0.24), hsCRP (7 (5–17) vs. 6 (2–14) mg/L, p = 0.33), anti-CRP (7 (5–12) vs. 8 (5–11) ng/mL, p = 0.41), IL-6 (5 (2–17) vs. 5 (2–11) pg/mL, p = 0.76), and IL-10 (13 (3–31) vs. 3 (3–24) pg/mL, p = 0.58). However, presepsin levels were significantly lower in SLE pts with joint involvement (111 (87–153) pg/mL) compared to those without such manifestations (145 (122–175) pg/mL, p = 0.04).

Conclusion: Joint involvement (arthralgias and/or arthritis) is present in majority of SLE pts (84%) and is associated with higher disease activity and anti-dsDNA positivity. Our data did not find the association between joint involvement in SLE and levels of serum inflammatory markers and cytokines, except for lower presepsin levels.

P382
ABALOPARATIDE INCREASES DISTAL FEMUR BMD POST TOTAL KNEE ARTHROPLASTY

N. Binkley[1], D. Krueger[1], G. Borchardt[1], B. Nickel[1], P. A. Anderson[1]

[1]Univ. of Wisconsin, Madison, USA

Objective: Osteoporosis is common in total joint replacement patients and increases risk for adverse outcomes including revision surgery and periprosthetic fracture. Existing data indicate total knee arthroplasty (TKA) leads to rapid distal femur bone loss. We hypothesized that Abaloparatide (ABL) would mitigate this loss. The purpose of this preliminary analysis is to evaluate the effect of ABL begun $\sim$ 3 months prior to TKA on distal femur BMD.

Methods: Female and male TKA candidates age $\geq$ 55 y were enrolled in this open-label 18-month study. Those with clinical osteoporosis, defined as T-score ≤ -2.5, or < -1.0 with prior low-trauma fracture, received subcutaneous ABL up to 80 mcg daily. Subjects with osteopenia but without fracture comprised an untreated control (CON) group. BMD was measured by DXA at the lumbar spine, total hip, 0.3 radius and two distal femur regions of interest (ROIs) at screen ($\sim$ 3 months pre-TKA), 1-week pre-surg, 6 and 15-months post-surg. Distal femur BMD was measured at ROIs placed at 15% and 25% of femur length. Groups were compared at baseline by t-test. For this preliminary analysis in study completers (n = 14 ABL/27 CON) BMD change at all measured sites was assessed by ANOVA.

Results: All 58 subjects (29 ABL/29 controls) have been enrolled. Sex, mean (SD) age and BMI did not differ between ABL and CON groups; 3 vs. 7 male, 70.6 (7.1) vs. 68.5 (7.0) years and 31.4 (6.1) vs.

30.9 (4.6) kg/m^2, respectively. ABL group baseline BMD was lower ($p \leq 0.05$) at all measured sites. ABL was administered for a mean (SD) of 92 (56) days prior to TKA. At the 15% distal femur ROI, BMD percentage change from screening was higher than control ($p < 0.05$) at pre-surg, 6 and 15 months post-surg by 1.7%, 7.0% and 9.2%, respectively. Similarly, at the 25% ROI BMD change was greater ($p < 0.05$) at 6 (4.7%) and 15 months post-surg (5.9%). At 15 months post-surg, spine and total hip BMD change from baseline was greater ($p < 0.001$) in the ABL than CON group (6.3% and 6.3%, respectively).

Conclusion: In this preliminary analysis, ABL increased distal femur BMD, compared with control, in TKA recipients. This increase was demonstrable with $\sim$ 3 months of treatment.

P383
ASSOCIATION OF OSTEOGENESIS IMPERFECT AND COOLEY'S ANEMIA: AN UNPRECEDENTED SITUATION!

D. Lardjani[1], S. Djennadi[1], R. Hassani[1], L. Rezgui[1], M. Azzi[1], M. Djennane[1]

[1]Hospitalo Univ. Center, Tizi Ouzou, Algeria

Osteogenesis imperfecta (OI), or brittle bone disease, is characterized by bone fragility and osteopenia. It associates skeletal and extraskeletal signs. Cooley's anemia is homozygous form of β-thalassemia. We report a situation where these two pathologies coexist.

Casereport: 31-year-old female patient from a non-consanguineous marriage, with a family history of heterozygous β-thalassemia and OI. She has a homozygous B-thalassemia with iron chelation and transfusions complicated by hemochromatosis with primary amenorrhea, hypoparathyroidism and hepatomegaly, treated in rheumatology for OI type IV according to Sillence and Glorieux classification by intravenous bisphosphonates since the age of 18 years, stopped because of secondary hypocalcemia to the hypoparathyroidism. Physical examination reveals failure to thrive, gray skin, pectus carinatum, scoliosis, lower limbs curvature, yellow opalescent teeth and enlarged abdomen. Biology: Normocytic normochromic anemia, hypocalcemia, hypoparathyroidism, hypovitaminosis D, normal alkaline phosphatase and normal phosphatemia. Radiology: Diffuse demineralization, the pelvis in the heart of playing card, fish vertebrae, Looser fracture on the femoral shaft, hair-on-end appearance of the skull, a gridded appearance of the epiphyses. Bone densitometry: Z-score: $-$ 2.5 at the neck and spine. The patient received a treatment for hypocalcemia and hypovitaminosis D, then in addition intravenous bisphosphonate with tight control.

Discussion: OI is a rare genetic disorder with autosomal dominant or recessive transmission, caused by mutations in chromosomes 7 or 17 encoding the chains of type I collagen fibers, with polymorphic clinical expression, which is not particularly associated with other diseases. Cooley's anemia is also a genetic disease due to β globin gene mutation on the chromosome 11, it is autosomal recessive transmission. Like OI, it is not known to have any associations with other diseases.

Conclusion: The association of osteogenesis imperfecta and Cooley's anemia, which are two rare genetic diseases, is only a coincidence. With a distinct pathophysiology for each one, both forming a rather particular phenotype requiring a delicate therapeutic management.

P384
ASSOCIATION OF OSTEOGENESIS IMPERFECT AND COOLEY'S ANEMIA: AN UNPRECEDENTED SITUATION!

D. Lardjani[1], S. Djannadi[1], R. Hassani[1], L. Rezgui[1], M. Azzi[1], M. Djennane[1]

[1]Univ. Hospital Center, Tizi Ouzou, Algeria

Osteogenesis imperfecta (OI), or brittle bone disease, is characterized by bone fragility and osteopenia. It associates skeletal and extraskeletal signs. Cooley's anemia is homozygous form of β-thalassemia. We report a situation where these two pathologies coexist.

Casereport: 31-year-old female patient from a non-consanguineous marriage, with a family history of heterozygous β-thalassemia and OI. She has a homozygous B-thalassemia with iron chelation and transfusions complicated by hemochromatosis with primary amenorrhea, hypoparathyroidism and hepatomegaly, treated in rheumatology for OI type IV according to Sillence and Glorieux classification by intravenous bisphosphonates since the age of 18 years, stopped because of secondary hypocalcemia to the hypoparathyroidism. Physical examination reveals failure to thrive, gray skin, pectus carinatum, scoliosis, lower limbs curvature, yellow opalescent teeth and enlarged abdomen. Biology: Normocytic normochromic anemia, hypocalcemia, hypoparathyroidism, hypovitaminosis D, normal alkaline phosphatase and normal phosphatemia. Radiology: Diffuse demineralization, the pelvis in the heart of playing card, fish vertebrae, looser fracture on the femoral shaft, hair-on-end appearance of the skull, a gridded appearance of the epiphyses. Bone densitometry: Z-score: $-$ 2.5 at the neck and spine. The patient received a treatment for hypocalcemia and hypovitaminosis D, then in addition intravenous bisphosphonate with tight control.

Discussion: OI is a rare genetic disorder with autosomal dominant or recessive transmission, caused by mutations in chromosomes 7 or 17 encoding the chains of type I collagen fibers, with polymorphic clinical expression, which is not particularly associated with other diseases. Cooley's anemia is also a genetic disease due to β globin gene mutation on the chromosome 11, it is autosomal recessive transmission. Like OI, it is not known to have any associations with other diseases.

Conclusion: The association of osteogenesis imperfecta and Cooley's anemia, which are two rare genetic diseases, is only a coincidence. With a distinct pathophysiology for each one, both forming a rather particular phenotype requiring a delicate therapeutic management.

P385
EFFECTIVENESS OF OSTEOPOROSIS DRUGS IN PATIENTS WITH TYPE 2 DIABETES MELLITUS: A POPULATION-BASED COHORT STUDY

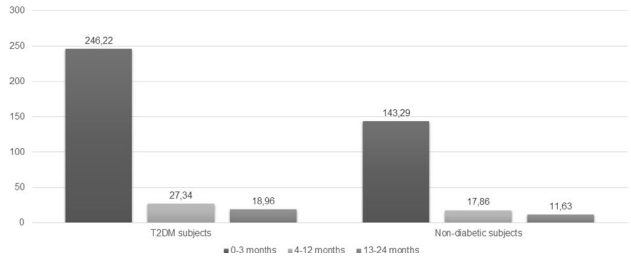
L. Gómez Rodríguez[1], J. L. Poveda[2], C. Carbonell-Abella[1], C. Reyes[3], M. A. Pou Giménez[1], C. Díaz Torné[4], D. Martinez-Laguna[1]

[1]Institut Català de la Salut. Primary Care, Barcelona, [2]Univ. of Navarra, Institute of Data Science and Artificial Intelligence (DATAI), Pamplona, [3]IDIAP Jordi Gol., Barcelona, [4]Rheumatology Dept., Hospital de Sant Pau, Barcelona, Spain

Objective: Patients with type 2 diabetes mellitus (T2DM) have an increased risk of fragility fractures. Contrarily, the tendency is to underestimate their risk, hence there is a lower prescription of osteoporosis drugs (OPD) compared to non-diabetics. In addition, the evidence for different OPD in these patients is limited. We aimed to analyze the differences between the incidence of new fractures in patients who receive an OPD, depending on the presence of T2DM or not.

Methods: Population-based cohort study conducted in the primary care setting. All subjects who initiated an OPD between 2012–2016 were selected from the SIDIAP database which contains anonymized clinical information of > 5.5 million patients in Catalonia. Those who had received an OPD in the previous 12 months, with a history of neoplasia, Paget's disease or HIV infection were excluded. Each T2DM subject was propensity-score matched up to 5 non-diabetic subjects. Each patient was followed until study end date, fracture event, date transferred out of the practice, or death. Fracture incidence rates were calculated in periods 0–3 months, 4–12 months, and 13–26 months.
Results: We identified 45,991 subjects who started a OPD (6,083 with T2DM and 39,908 non-diabetics), of whom 89.8% were women, mean age (SD) 69.1 (10.5) y. The most used OPD was oral bisphosphonate (80.6%), followed by denosumab (9.7%). 15.7% had a previous fracture. The baseline incidence rate of all fractures (0–3 months) was higher in T2DM patients than in those non-diabetics. Fracture incidence rates are shown in Fig. 1.

Figure 1: Fracture incidence rate per 1000 person-year, according to T2DM status.



Conclusion: Continued treatment with OPD was associated with reductions of fracture rates in both T2DM and non-diabetic subjects. Differences in early-treatment period fracture rates indicate that T2DM patients' individual fracture risk should be considered.

P386
FEATURES OF BONE TISSUE IN CHILDREN OF DIFFERENT GENDERS DEPENDING ON GROWTH INTENSITY, POLYMORPHISM OF THE VDR GENE AND VITAMIN D LEVELS

T. Frolova[1], D. Mcgovan[2], N. Osman[1], N. Stenkova[1], I. Siniaieva[1], A. Amash[1], O. Savvo[3], T. Khalturina[3], F. Leontieva[4]

[1]Kharkiv National Medical Univ., Kharkiv, Ukraine, [2]Spine &Orthopedic Surgery Associates, Nebraska, USA, [3]Kharkiv Regional Children's Clinical Hospital, Kharkiv, Ukraine, [4]Sytenko Institute of Spine and Joint Pathology of the National Academy of Medical Sciences of Ukraine, Kharkiv, Ukraine

Objective: To establish the densitometric characteristics of bone tissue in children taking into account gender, growth intensity, polymorphism of the VDR gene and vitamin D status.
Methods: 151 children aged 9–17 were examined, who were divided into two groups depending on gender (78 males and 73 females). Inclusion criteria: absence of chronic somatic and endocrine pathology, hereditary and genetic diseases. A general clinical examination, determination of the level of 25-(OH)-D, ultrasound densitometry (QUS), molecular diagnostics (BSML polymorphism of the VDR gene) were performed. The criterion for a growth spurt (GS) was a growth of 8 cm or more in the current year. Decreased bone density was defined as BMD Z-score ≤ -2.0 (The International Society for Clinical Densitometry 2019).
Results: Decreased BMD according to QUS was diagnosed in 44.87% of males (Z-score -2.29 ± 0.32) and 42.47% of females (Z-score -2.40 ± 0.31). In the group of males with growth spurts, a decrease in BMD was found in 52%; in the group of females with growth spurts, a decrease in BMD in 60%. All examined children had a deficiency or insufficient level of vitamin D, the average level of which was 40.30 ± 9.51 nmol/l. The average level of vitamin D in children with low BMD and without growth spurts was: in males—37.17 ± 9.04 nmol/l, in females—36.28 ± 9.04 nmol/l; with low BMD and growth spurts: males—41.42 ± 11.52 nmol/l, females—37.62 ± 12.75 nmol/l. When studying the BSML polymorphism of the VDR gene in children with low BMD, the following results were obtained: pathological mutations (heterozygous and homozygous) were found in 35.71% of males with growth spurts and 55.56% of males without growth spurts; 57.14% of females with growth spurts and 56.25% of females without growth spurts had pathological mutations.
Conclusion: The examined children have insufficient levels of vitamin D. Low BMD in the examined children during the period of intensive growth is not related to the status of vitamin D. But intensive growth is the reason for the decrease in BMD. Pathological mutations of the BSML polymorphism of the VDR gene were also not associated with low BMD in children with growth spurts, but were more common in females. Mineralization of bone tissue during the spurt period depends not only on the genetic component and the status of vitamin D, but also on the growth mechanisms, which are characterized by the discrepancy between the growth rate and the accumulation of bone mass.

P387
INCREASED PREVALENCE OF OSTEOPOROSIS AND DECREASED HIP BONE MINERAL DENSITY IN PATIENTS WITH ENDOCRINE AND NON-ENDOCRINE CAUSES OF HYPONATREMIA

D. Miljic[1], M. Nikolic-Djurovic[1], M. Doknic[1], S. Pekic[1], M. Stojanovic[1], Z. Jemuovic[1], I. Cekic[1], I. Jevtic[1], B. Kurcubic[2], S. Borozan[3], S. Vujosevic[3], M. Petakov[1]

[1]Clinic for Endocrinology, Diabetes and Metabolic Diseases, Dept. of Neuroendocrinology, Univ. Clinical Centre of Serbia, Belgrade, Serbia, [2]Faculty of Medicine, Univ. of Belgrade, Belgrade, Serbia, [3]Clinical Centre of Montenegro, Podgorica, Montenegro

Previous studies have shown that longer duration of hyponatremia is associated with an increased risk of osteoporosis, while even mild hyponatremia is an independent risk factor for decreased bone mineral density, risk of falls and fractures. We have conducted a retrospective cohort study, which included patients treated for chronic endocrine and non-endocrine causes of hyponatremia, over the last decade at the Department of Neuroendocrinology, Clinic for Endocrinology, Diabetes and Metabolic Disease of the University Clinical Centre of Serbia, who had osteodensitometric studies performed during their hospitalization. Clinical, biochemical, hormonal and osteodensitometric parameters of patients and age and gender matched control subjects, without hyponatremia, were analyzed and compared. 34 subjects participated in the study, 19 patients (11 women, 57.9%, 10/11 menopausal) mean age 62.8 ± 14.6 y, mean sodium level 127.2 ± 5.25 mmol/L and 15 healthy subjects (8 women, 53.3%, 6/8 menopausal) mean age 53 ± 15 y with no comorbidities and normal sodium levels. The most common endocrine cause of hyponatremia was adrenal insufficiency, which was secondary (pituitary) in 7 (36.8%) and primary (adrenal) in 3 (15.8%) patients, while the most common non-endocrine cause of hyponatremia was the syndrome of inadequate anti-diuresis (SIAD), caused by malignant disease in 5 (26.3%) or idiopathic in 4 (21%) patients. Decreased BMD was observed in 20 of 34 investigated subjects (58.8%), 13 (65%) had osteopenia (53.8% of patients with

hyponatremia compared to 46.2% of controls, $p < 0.05$), and 7 (35%) had osteoporosis (100% patients with hyponatremia vs. 0% controls, $p < 0.05$). Decreased BMD was significantly more prevalent in patients with hyponatremia compared to controls 73.7% (14/19) vs. 40% (6/15) ($p = 0.05$). However, no statistically significant difference was found in the prevalence of reduced BMD in patients with different causes of hyponatremia in endocrine vs. non-endocrine causes (70%(7/10) vs. 73.7%(7/9); $p > 0.05$). Patients with hyponatremia had significantly lower BMD and T-score values at total hip compared to controls (-1.53 ± 2 vs. -0.56 ± 0.9; $P = 0.05$), while statistical difference between the groups was not reached for mean values of T-score at lumbar spine (-1.4 ± 1.3 vs. -0.8 ± 0.9; $P = 0.08$). Our results confirm significantly higher prevalence of osteoporosis and decreased BMD in patients with hyponatremia, irrespective of its etiology, which is more evident at total hip than lumbar spine.

P388
INCIDENCE AND INFLUENCE OF VITAMIN D DEFICIENCY IN PATIENTS WITH OSTEOARTHRITIS: A SYSTEMATIC REVIEW

B. Neagu[1], A.-E. Cristea[1], D. Oprea[2], L.-E. Stanciu[2], M. Minea[1], C. Mihailov[3], M.-G. Iliescu[4]

[1]Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol, Ovidius Univ. Faculty of Medicine Doctoral School, [2]Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol, Dept. of Medical Rehabilitation, Faculty of Medicine, Ovidius Univ. of Constanta, [3]Dept. of Rheumatology, Faculty of Medicine, Ovidius Univ. of Constanta, [4]Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol, Ovidius Univ. Faculty of Medicine Doctoral School, Dept. of Medical Rehabilitation, Faculty of Medicine, Ovidius Univ. of Constanta, Constanta, Romania

Objective: This systematic review aimed to search the current literature and provide evidence regarding the correlation between vitamin D deficiency and the severity of osteoarthritis (OA).
Methods: A systematic review was performed based on the PRISMA methodology. Studies were identified from the following databases: PubMed, Scopus, Web of Science, Cochrane, PEDro using the keywords: vitamin D deficiency and osteoarthritis, 25-hydroxyvitamin D deficiency and osteoarthritis. We included only articles written in English from the last 10 y, about patients suffering from OA, regarding the type of it and containing information about the serum level of 25(OH)D. Reviews, meta-analysis and articles about vitamin D deficiency in correlation with inflammatory rheumatic diseases or another serum biomarkers were excluded.
Results: The general search resulted in 1090 articles: 180 in PubMed, 469 in Scopus, 418 in Web of Science, 22 in Cochrane and 1 in PEDro, of which 22 studies fitted the inclusion criteria. The relationship between vitamin D and OA revealed a high incidence of lower vitamin D serum levels in patients with OA.
Conclusion: The goal was to review a select literature in order to present recently studies on degenerative diseases that show a high prevalence of vitamin D deficiency to sustain the major role of vitamin D in musculoskeletal system health maintenance. Even so, further studies are necessary to confirm the association between vitamin D deficiency and OA.

P389
ROLE OF SHORT REHABILITATION PROGRAMS IN OLDER ADULTS FOR IMPROVING MOBILITY AND PREVENTING FALLS

A. T. Vancea[1], A. A. Lupu[1], D. Oprea[1], L. E. Stanciu[1], M. G. Iliescu[1], I. Calatoiu[2], L. Spiru[3]

[1]Dept. of Medical Rehabilitation, Faculty of Medicine, Ovidius Univ. of Constanta, Constanta, [2]Faculty of Medicine, Ovidius Univ. of Constanta, Romania., Constanta, [3]Carol Davila Univ. of Medicine and Pharmacy, Bucuresti, Romania

Objective: This study emphasizes averting the risk of falling among older adults, focusing on a complex rehabilitation program at Techirghiol Balneal and Rehabilitation Sanatorium (TBRS), a famous location for rehabilitation in Romania. The primary objective was to assess changes in the risk of falling from admission to discharge and evaluate the short-term rehabilitation process's efficacy in mitigating this concern.
Methods: The research was conducted on 156 patients over 65, hospitalized for a rehabilitation program, using 12 d of physical procedures, such as physiotherapy, thermotherapy, massage, kinetotherapy, and hydrokinetotherapy in salty water from Techirghiol Lake, adapted to the main pathology, osteoarthritis. All the patients signed the informed consent for the study. Acknowledging the repercussions of fall-related injuries on the autonomy of the elderly, the study explores the role of a short-term rehabilitation program, using two evaluations, at admission and discharge, using the STRATIFY scale for assessing fall risk, the visual analogue scale (VAS) for self-reported pain and Functional Independence Measure (FIM) scores for motor and cognitive dysfunctions.
Results: Analysis of the study batch reveals substantial improvements in preventing the risk of falling through the short-term rehabilitation program. The study demonstrates a notable reduction in fall risk from admission to discharge, mean value of the STRATIFY scale decrease of -0.257. There is also a significant evolution of the general FIM score at discharge, in the sense of its increase, an aspect mainly due to the improvement of functionality at the locomotor level (mean value improvement of 1436 in patients' motor ability). The mean value of VAS decreases to -3.141 between the two moments of evaluation, indicating a significant reduction in pain intensity in the evaluated patients.
Conclusion: This research highlights the brief rehabilitation program's effectiveness at TBRS in diminishing the risk of falling and preserving independence among geriatric patients. The pairs of variables measured at admission and at discharge, indicate remarkable internal consistency with statistical significance (p-value < 0.001). Our study has practical implications for healthcare professionals, in implementing efficient fall prevention strategies.

P390
RELATIONSHIP BETWEEN DEPRESSIVE SYMPTOMS AND FRAILTY IN OLDER ADULTS

D. Orentaitė[1], A. Mastavičiūtė[1], V. Ginevičienė[1], J. Kilaitė[1], R. Dadelienė[1], I. E. Jamontaitė[1], E. Pranckevičienė[1], I. Ahmetov[1], V. Alekna[1]

[1]Vilnius Univ., Vilnius, Lithuania

Objective: Frailty and depression are two common syndromes among older adults. These geriatric syndromes are associated with a range of deleterious outcomes in older age such as lower quality of life, increased use of healthcare services, increased morbidity and mortality [1–3]. Scientific research about depressive symptoms associations with frailty in older adults are scarce. The aim of this

study was to investigate the relationship of depressive symptoms and frailty in community dwelling older adults.
Methods: This cross-sectional study was conducted on community dwelling older adults aged $\geq$ 65 y with normal cognition and mild cognitive impairment. A total of 51 older adults (78.4% women) with average age 77.82 $\pm$ 1.04 y were involved in this study. Exclusion criteria were chronic diseases with acute organ failure, musculoskeletal and nervous system diseases, restricting mobility. Cognitive status was evaluated using the Mini Mental State Examination (average was 27.49 $\pm$ 0.28). Geriatric Depression Scale (GDS) short form was used to measure depressive symptoms. Frailty was assessed using Fried's phenotype (robust [0 score] pre-frail [1–2 score] and frail [$\geq$ 3 score]). The relationship between variables was calculated using Spearman correlation coefficients with statistical significance $p < 0.05$. Data was analyzed using IBM SPSS Statistics 29.0.2.0 version.
Results: The average score of GDS was 3.2 $\pm$ 0.34. Depressive symptoms were observed in 46 of 51 patients, 31.4% of individuals having scored mild and moderate depression. The average score of Fried's phenotype criteria was 1.67 $\pm$ 0.22. The analyzed data showed that 25.5% of patients were robust, 49.1% of individuals were pre-frail and 27.5% frail. The analysis demonstrated a statistically significant moderate positive correlation between depressive symptoms and frailty ($r = 0.407$, $p = 0.003$).
Conclusion: The results of our study revealed that depressive symptoms and frailty were moderately correlated in community dwelling older adults.
Acknowledgement: This project has received funding from the Research Council of Lithuania (LMTLT), agreement No S-MIP-22–36.
References:

1. Clegg A, et al. Lancet 2013;381:752
2. Hare DL, et al. Eur Heart J 2014;35:1365
3. Rodda J, et al. BMJ 2011;343:d5219

P391
RELATION BETWEEN PERCEIVED WORK ABILITY AND CLINICAL CHARACTERISTICS OF THE DISEASE IN PATIENTS WITH RHEUMATOID ARTHRITIS

D. Petrovic[1], M. Perovic[1], P. Ostojic[1]

[1]Institute of Rheumatology, Belgrade, Serbia

Objective: Population aging leads to increased focus on work ability, preventing early employment termination and increasing work productivity of patients with rheumatoid arthritis (RA). We aimed to examine the perceived work ability of working patients with RA and its relation to the clinical characteristics of RA.
Methods: The sample included 103 patients, with an average age of 48 y and average disease duration of 5 y to the diagnosis and 7 y total. 75.9% of patients had positive RF and/or ACPA. Radiographic joint damage was determined in 62.8% of patients by hands and feet X-rays not older than a year. 67% of patients were treated with conventional synthetic disease-modifying antirheumatic drugs (csDMARD), while 33% of patients received biological drugs (bDMARD) or Janus kinase inhibitors (JAKi). Serbian version of the Work Ability Index (WAI) was used to assess perceived work ability. The WAI values were examined in relation to pain (assessed by VAS), functional capacity (HAQ), depression (BDI), fatigue (FACIT) and disease activity (DAS_{28}).
Results: The average WAI value was 42.1 $\pm$ 9.0. There was no difference in the average WAI value between groups of patients in relation to RF/ACPA seropositivity, presence/absence of structural joint damage, disease duration to the diagnosis, the total duration of RA or the type of applied therapy. A significant negative correlation was determined between perceived work ability and pain intensity ($r = -0.355$, $p < 0.001$), functional capacity ($r = -0.288$, $p = 0.003$), depression ($r = -0.303$, $p = 0.001$) and fatigue ($r = -0.293$, $p = 0.002$). A negative correlation was observed between DAS_{28} and WAI, but it was not statistically significant.
Conclusion: RA patients assessed their perceived work ability as very good on average. Depression, fatigue, severe pain and limited functional capacity were significantly associated with decreased perceived work ability. These results should be confirmed by larger randomized studies.

P392
COMBINING SYSTEMIC AND LOCAL OSTEOPOROSIS TREATMENTS IN OVARIECTOMIZED RATS

V. Stadelmann[1], E. Gerossier[2], U. Kettenberger[3], D. Pioletti[2]

[1]Dept. of Research and Development, Schulthess Klinik, Zurich, [2]LBO/EPFL, Lausanne, [3]flowbone SA, Lausanne, Switzerland

Objective: HA2, a novel, hydrogel-based, and highly injectable biomaterial for local bone strengthening, was combined with two systemic anti-osteoporosis treatments and a local bisphosphonate to assess combined effects on bone density in a rat model of osteoporosis.
Methods: 36 ovariectomized Wistar rats were randomly assigned to vehicle (VEH), alendronate (ALN), or PTH groups and underwent systemic treatment with those substances throughout the entire study. One week after treatment started, the 72 tibias of the rats were block-randomized into 3 sub-groups, and their plateaus were injected with either NaCl as control, HA2 or HA2-ZOL (with incorporated Zoledronate), excluding two times the same treatment in one animal. In vivo μCT scans of the proximal tibiae of all animals were acquired at baseline (week $-$ 1), immediately post-injection (week 0), and at 2, 4, 6, and 8 weeks thereafter. Changes in bone were evaluated within and outside the injected zone, which was identified on the post-injection scans. Histology was performed on the harvested bone samples.
Results: HA2 injections more than doubled local bone mass in the VEH animals within 4 weeks and tripled it in the ALN and PTH groups. Local bisphosphonate in HA2-ZOL strongly enhanced this effect in the VEH and PTH animals but less in combination with systemic ALN. HA2-ZOL also significantly slowed down the resorption of the newly formed bone, especially in the VEH and PTH animals. Neither HA2 nor HA2-Zol influenced bone outside the injected zone.
Conclusion: This study suggests that HA2, an injectable biomaterial capable of promoting new bone formation, could be a valuable addition to established anti-osteoporotic drugs, with and without an integrated bisphosphonate. It can increase bone density rapidly and significantly in regions at high risk of fracture.
Disclosures: UK and DP hold shares of flowbone SA.

P393
TREATMENT AND MANAGEMENT OF OSTEOPOROTIC FRACTURES IN MEN: A 8-YEAR STUDY OF REAL-WORLD CLINICAL PRACTICE IN A SINGLE-CENTRE (OSTEOPROM, PART III)

D. Pokšāne[1], I. Rasa[2]

[1]Rīga Stradiņš Univ. (RSU), Latvian Osteoporosis and Bone Metabolic Diseases Association (LOKMSA), [2]Riga East Clinical Univ. Hospital (RECUH), Latvian Osteoporosis and Bone Metabolic Diseases Association (LOKMSA), Riga, Latvia

Objective: The insufficient knowledge of male osteoporosis (OP) accounts for the lack of well-shared protocols for clinical management. The growing data on the pathophysiology of bone and epidemiological data of fracture in men are becoming available. We studied the BMD increase and the anti-fracture effectiveness of denosumab (Dmab) in the male cohorts (OsteoProM).
Methods: We conducted the single-centre real-world retrospective observational Study from 2014–2022. We collected RECUH Outpatient Clinic data from medical records and then manually analysed it. We analysed fracture risk factors, fracture incidences, BMD changes, laboratory data (Ca, vitamin D, iPTH), co-morbidities and concomitant medications. BMD of the lumbar vertebrae L1/L4 and the total mean hip by DXA scans were performed for the initial and final diagnoses of the Study. Statistical analysis was performed using IBM SPSS v29.0.
Results: We analysed 60 men with OP. The mean age was 64.2 ± 11.9 SD yrs and included: one patient aged 18–40 yrs, five patients aged 41–50 yrs, 15—aged 51–60 yrs, 21—aged 61–70 yrs, 13—aged 71–80 yrs, and five—aged > 80 yrs. Men with idiopathic OP were 75.0% (n = 45), glucocorticoid-induced OP—13.5% (n = 8) and secondary OP—11.5% (n = 7). Dmab increased BMD at lumbar spine L1/L4 by 80.0% and total mean hip by 76.9%. Before the Study started, pts with at least one fracture were 50%, mainly in the spine (63.3%) and also other fracture types—hip, forearm, and ribs. After the Study ended, three patients had at least one fracture. Men were divided into six groups according to injection (inj.) numbers from 1 to 13 inj. BMD by DXA was analysed in each inj. group.
Conclusion: Dmab is an effective anti-fracture medication, which significantly and promptly increases BMD in DXA scans at the lumbar spine and the total mean hip in men with and without fractures. Dmab is an appropriate clinical option in men with intolerance or contra-indications to bisphosphonates and is also a reasonable first-line treatment.

P394
VITAMIN D STATUS IN LATVIAN POPULATION IN 2023: RESULTS FROM TWO BIGGEST LABORATORY DATABASES

D. Pokšāne[1], I. Rasa[2]

[1]Rīga Stradiņš Univ. (RSU), Latvian Osteoporosis and Bone Metabolic Diseases Association (LOKMSA), [2]Latvian Osteoporosis and Bone Metabolic Diseases Association (LOKMSA), Riga East Clinical Univ. Hospital (RECUH), Riga, Latvia

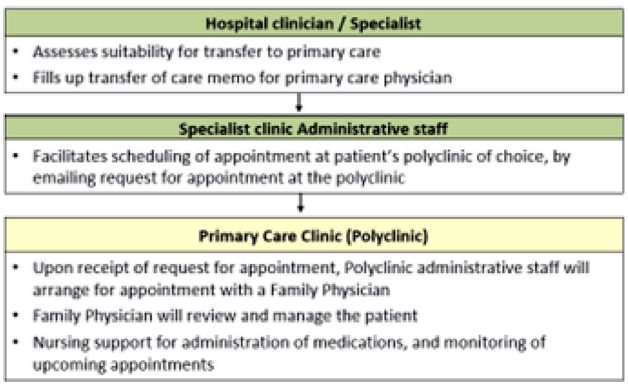
Objective: Vitamin D deficiency is a global public health problem. A decreased vitamin D level is a risk factor for many diseases and mortality rates in general. Due to that, the prevalence of vitamin D deficiency is an important topic in public health. The study aimed to evaluate the status of the total 25-hydroxy vitamin D (chemiluminescent assays) in adults in Latvia in 2023.
Methods: The retrospective study from January 2023 to December 2023 included data from 465,150 patients from two electronic databases: Central Laboratory Ltd. and E. Gulbja Laboratory Ltd. in 2023. Vitamin D deficiency was defined as < 20 ng/mL, insufficiency as 20–30 ng/mL, optimal level as 30–50 ng/mL, and excess of vitamin D as > 100 ng/mL. All data were analyzed in IBM SPSS v29.0.
Results: In 2023 in Latvia, 465,076 tests were done for a total of 25-hydroxyvitamin D tests—were women 68% (n = 318,214), men 32% (n = 146,862), and the mean age was 48 y. Vitamin D deficiency was found in 15.0% (n = 69,617) of the study cases, insufficient level in 30.7% (n = 142,920); 51.4% of patients had an optimal level of vitamin D (30–50 ng/mL in 42.8% (n = 199,345), 50–75 ng/mL in 10.3% (n = 47,774), 75–100 ng/mL in 1.0% (n = 4507)). Excess of vitamin D had 0.2% (n = 987) of the study population.
Conclusion: Vitamin D insufficiency and deficiency in the study population were almost as common as optimal levels of vitamin D. These results demonstrate the importance of electronic database analyses concerning vitamin D levels.

P395
RIGHT-SITING OSTEOPOROSIS PATIENTS ON DENOSUMAB TO PRIMARY CARE: EXPERIENCE FROM A SINGAPORE PRIMARY CARE CLUSTER

D. S. Choong[1], G. C. S. Tan[1], S. L. Kok[1], K. H. Koh[1], J. J. L. Chua[1], D. L. S. Tng[1]

[1]SingHealth Polyclinics, Singapore, Singapore

Objective: The model of care to 'right-site' patients with stable chronic disease from secondary care to primary care, supports Singapore's health strategy of "Beyond hospital to community"—one of the "Three Beyonds" that the Ministry of Health has embarked on to sustain quality healthcare amidst rising demand. Osteoporosis is a chronic disease managed in both primary care and secondary care. Anti-osteoporosis medications commonly used in Singapore include bisphosphonates and denosumab. Use of denosumab for osteoporosis remained mostly confined to specialty-care settings in Singapore's public healthcare system and is not routinely used by public sector primary care (polyclinic) physicians. A workflow was implemented to allow right-siting of patients on denosumab for osteoporosis to transition from hospital to polyclinics.
Methods: Patients suitable for discharge to primary care, according to inclusion criteria, were right-sited via workflow in Figure. Patients excluded were those with severe renal impairment, or had conditions requiring continuing specialist's care. The outcome measures were the number of patients transferred under this framework, the number of injections administered, and the number of referrals back to specialty centre.



Results: From July 2020 to December 2023, a total of 288 patients transferred from hospital to community settings under right-siting framework. A total of 721 denosumab injections were cumulatively administered under the right-siting framework. From 2021–2023, 17 patients were referred to specialty centre under predefined fast track criteria. A physician survey (n = 13) showed 84.7% of polyclinic physicians self-reporting at least moderate levels of confidence in managing patients on denosumab. The program was thereafter expanded to two other hospitals in late 2023.
Conclusion: The right-siting workflow created a structured framework to transition patients on denosumab to primary care. Such a framework grants patients convenience and enables primary care doctors to be familiar with its use.

Acknowledgements: The authors wish to thank the following colleagues from Singapore General Hospital, Dept. of Endocrinology for their invaluable guidance in this collaboration: Prof Manju Chandran, Ms Huang Xiaofeng, Ms Liu Xiaoming. Dr Jane Tan, Ms Wendy Foo, Ms Hannah Lye, Ms Nur Syarina Binte Shaari and all others from SingHealth Polyclinics who supported this right-siting pathway.
Disclosure: DS Choong has participated as panelist and received support to attend conferences by Amgen.

P396
EFFECT OF INTRODUCING A FRACTURE LIAISON SERVICE IN A SMALL HOSPITAL ON PATIENT OUTCOMES

D. Schweppenhäuser[1], M. Förtsch[2]

[1]Orthopedic Dept., ev. Krankenhaus Bad Dürkheim, Bad Dürkheim, [2]Ortho 1 a Ludwigshafen, Ludwigshafen, Germany

Objective: Patients aged over 50 with fragility fractures of wrist, proximal humerus, spine and proximal femur and patients aged over 80 with all fractures were treated in the hospital. They have a high imminent risk of a subsequent fracture. The aim was to describe the impact from introducing an FLS on readmission rates with fragility fractures in a small hospital.
Methods: In 2019 an FLS was implemented in a small hospital (235 inpatient beds) that is the only hospital in the region. The FLS identified adults fractures. All patients were referred to the local osteologist by the FLS coordinator for DXA and ongoing treatment. We compared the readmission rate and mortality for patients admitted in 2018 and 2022 using hospital records. Differences were tested using chi-square.
Results: In 2018, 217 patients with fragility fractures were treated in the hospital, mean age 77.2 and 257 in 2022 (mean age 77.9). There was a significant reduction in readmissions due to fracture and mortality but not readmissions due to other causes (Table). Of the 15 patients with a subsequent fracture in 2022, 5 were seen in the FLS and 9 had a treatment recommendation in discharge letter.

Table. Subsequent re-admissions and mortality over X years after index fragility fracture

Year	Total	Seen by FLS	Readmitted with fracture	Other readmission	Mortality
Pre FLS 2018	217	0	30 (13.8%)	52 (24.0%)	22 (10.1%)
Post FLS 2022	257	201 (78.2%)	15 (5.8%)	51 (19.8%)	12 ((4.6%)
p-value		n/a	0.003	0.28	0.02

Conclusion: Readmission rate due to fracture and mortality was significantly reduced after implementing the FLS but not readmissions for other reasons, which remained high. Further work is needed to characterise the performance of the FLS and explore other interventions to reduce readmission rates and long term sustainability of the benefits shown.

P397
BENEFITS OF PHYSICAL EXERCISE IN THE IMPROVEMENT OF HAND GRIP STRENGTH IN PATIENTS WITH OSTEOPOROSIS AND SARCOPENIA

D. Stoicanescu[1], M. S. Deac[2], M. Cevei[2], A. Gherle[2]

[1]Univ. of Medicine and Pharmacy "Victor Babes", Timisoara, [2]Univ. of Oradea, Faculty of Medicine, Oradea, Romania

Physical exercise and nutritional intervention are currently the known solutions for sarcopenia. We present the case of a 38 years old male patient, with a medical history of resuscitated cardio-respiratory arrest of unknown etiology in 2013 and secondary osteoporosis after immobilization. The patient is a wheelchair user requiring assistance in performing ADLs. The modified Ashworth scale measuring the increase of muscle tone revealed spasticity: Ashworth score 1 for both upper and lower limbs. Apraxia and dysarthria were also found. The John Health System Corporation scale established a high risk of falling, with 19 points. The patient's self-care capacity, functional independence and functional ambulatory category were assessed using the FIM, Barthel and FAC (Functional Ambulation Classification) scale, respectively. FIM scale score was 25 points out of 126, 19.84%. Barthel Index score was 5 points out of 100 indicating the patient was totally dependent. FAC score was 0 indicating nonfunctional ambulatory. The diagnoses of osteoporosis and sarcopenia were based on BMD, ALM and grip strength data. BMD determination using DXA from 21.06.2022 indicated: lumbar spine Z-score: -1.6; left hip Z-score:-2.6; right hip Z-score:-2.0; ALM was 0.47. Grip strength measured with Jamar dynamometer on 23.06.2022 showed left handgrip strength 20 kg and right handgrip strength 22 kg. The dynamometry performed on 25.10.2023 indicated left handgrip strength 17 kg and right handgrip strength 32 kg. The recommendations were: daily exercise intervention programs at home; follow recommendations related to the prevention of falls and fall-related injuries. Conclusion: Medical rehabilitation programs improved upper limbs functionality.

P398
INPATIENT TREATMENTS IN VERY ELDERLY PATIENTS WITH FRACTURE NECK OF FEMUR: A UNIQUE GROUP NEEDING SPECIAL CONSIDERATION

D. Veness[1], H. Griffiths[1], R. Noble[1], A. Ahmed[1], J. Chillala[1]

[1]MFT, Manchester, UK

Objective: The risk of further fractures after a fracture neck of femur is very high, with zoledronic acid showing reduction in refracture rate by a third. The National Osteoporosis Guideline Group NOGG in 2021 recommended zoledronate as first line after fracture neck of femur. When we looked at previous data in very elderly this showed 60% of patients were not receiving any treatments post fracture apart from vitamin D. This study looked at which inpatient treatments were being given to very elderly patients with fracture neck of femur on an orthogeriatric ward and how barriers to treatment can be improved for initial treatment and follow on treatments.
Methods: The records of all patients discharged from July 2023 to October 23 on Elm unit, Trafford (an orthogeriatric assessment and rehabilitation unit) were examined. Of these, 76 patients were identified for data collection including comments on those patients who did not have treatment and also how follow up infusions were planned.
Results: 65.8% of patients received zoledronate treatment as an inpatient, which is still a lower figure than expected target. 5.5% of patients received denosumab. Remaining patients had optmisation of vitamin D. The main reasons for nontreatment were refusal by patient /family due to concern of side effects and difficulty attending for future doses. This was particularly where Cr clearance was low and patients felt unable to attend secondary care for ongoing denosumab. 30% patients who required ongoing infusions with zoledronate did not have follow up for 2nd doses.
Conclusion: Uptake of bone health treatment is still not ideal in older patients who are high risk of refracture. Improved communication/ information to patients and families who decline treatment may improve uptake numbers. Denosumab requires attendance to hospital if Cr Cl < 30, this is a major barrier for our patients with limited mobility post hip fracture and guidelines need to be reviewed for this group of patients. Home zoledronic acid treatment needs to be a standard service offered. An improved pathway for follow up of

patients and ongoing infusions is required in the absence of a fracture liaison service.

P399
RETROWALKING—A NEW APPROACH TOWARD REHAB TRAINING FOR OSTEOARTHRITIS KNEE: A REVIEW

D. Wadhwa[1], V. Phalke, R. Kunkolol[1]

[1]Pravara institute of Medical Science, Loni, India

Everyone talks of arthritis but considering its implications; no one wants to suffer from it! Arthritis foundation of India has cited an interesting Chalo Chalein (come we will move) test that most of us can understand. American College of Rheumatology Diagnostic and Therapeutic Committee defined OA as 'A heterogeneous group of conditions that lead to joint symptoms and signs which are associated with defective integrity of articular cartilage, in addition to relative changes in the underlying bone at the joint margins'. The disease limits everyday activities, such as getting in and out of bed, dressing and climbing stairs. Patients with knee Osteoarthritis seems to develop their own gait pattern and try to unload the affected structures during gait. This prolonged usage of secondary gait compensation creates greater imbalances of muscle, progressively reducing muscle strength, endurance, flexibility and later ending to deformity. Whenever you encounter a difficult situation, stepping backward may boost your capability to deal with it effectively' written by Severine Koch. Retrowalking is sometimes referred to as backward walking, has been thought to be used already for several decades in Japan and Europe to get a physical workout, improve sport performance, promote balance and to stay mentally fit. Retrowalking is a new approach in physiotherapy and rehabilitation. It has emerged as a beneficial exercise in terms of lowering peak patellofemoral joint compressive force, trauma to the articular cartilage is reduced, increase quadriceps strength, reduction in adductor moment at knee; all these reduce the disability thus leading to improved function. It also has effect on improving strength of hip extensors leading to reduced hip flexion moment during stance phase and thus preventing abnormal loading at knee joint and, in turn, the disability Retrowalking is associated with increased cadence, decreased stride length and different joint kinematics as compared to forward walking and hence may offer some benefits over forward walking alone. Thus, Retrowalking a new approach for rehab training for osteoarthritis knee has numerous benefits and improves the functional activity.

P400
IMPACT OF RETROWALKING ON OSTEOARTHRITIS OF KNEE: A CASE STUDY

D. Wadhwa[1], V. Phalke, R. Kunkolol[1]

[1]Pravara institute of Medical Science, Loni, India

Osteoarthritis is a very common case and is regularly physiotherapy clinics. Mostly the affected population is elderly in whom prominent weakening and wasting of quadriceps and hamstrings muscle is seen. As the affected population is mostly aged, they can't bear the heavy weight which is needed for strengthening. Hence one such and intervention is needed which may be easy to perform and cause strengthening of these weak muscles. Retrowalking is one such intervention and has been proved beneficial in treating symptomatic osteoarthritis of knee.

Casereport: A case of 65 years old male is presented in the report who presented with pain and stiffness in knee which was sudden in onset. Diagnosed with osteoarthritis of knee for by Orthopaedician substantiated by radiograph grade 2. Assessed for any physical disorders which are contraindicated for exercises by using Physical Activity Readiness Questionnaire (PAR-Q). The patient fulfilling clinical criteria listed by the American College of Rheumatology: knee pain-7 NPRS and any three out of six: age 65 y, morning stiffness lasting > 30 min, crepitus on active motion, bony tenderness, no warmth on touch and Clark test was positive. Ranges and muscle strength of the knee joint were found to be reduced. Outcome measures—NPRS, WOMAC-CRD and Berg balance scale treatment. The patients received retrowalking on flat surface (distance 20 m) at their maximum pace with support of the wall for 10 min/session. The session—4 min of retrowalking following 2 min of rest time and then again 4 min of retrowalking. Conventional exercise like static and dynamic quadriceps, SLR, static hamstring and hamstring stretch was given. Total treatment—5 d/week for 3 weeks. Even the pain had subsided drastically with improvement in WOMAC CRD and Berg balance score ($p < 0.05$). Patient was very comfortable after completion of 3 weeks treatment.

Conclusion: The importance of the new intervention that is retrowalking and glorifies its benefits.

P401
EXPLORING THE SARCOPENIA CRITERIA IN ADULT PATIENTS WITH DIABETES

C.-J. Wen[1], R.-S. Yang[2], W.-J. Huang[1], K.-P. Lin[1], T.-H. Yang[3], D.-C. Chan[1]

[1]Dept. of Geriatrics and Gerontology, National Taiwan Univ. Hospital, Taipei, [2]Dept. of Orthopedics, National Taiwan Univ. Hospital, Taipei, [3]Dept. of Orthopedics, NTU BioMedical Park Hospital, NTUH Hsin-Chu Branch, HsinChu, Taiwan

Objective: Sarcopenia is defined by age-related decline of skeletal muscle mass plus low muscle strength and/or physical performance. The European Working Group on Sarcopenia in Older People (EWGSOP) and Asian Working Group for Sarcopenia (AWGS) have established practical clinical definitions and consensus diagnostic criteria. However, these criteria are specifically designed for older individuals. Therefore, our aim is to investigate sarcopenia criteria applicable to adults.

Methods: A total of 178 patients with diabetes, aged 20–65, were recruited at the National Taiwan University Hospital (NTUH). Muscle mass criteria were assessed using DXA and bioelectrical impedance analysis (BIA). Muscle strength was determined by measuring handgrip strength, and physical performance criteria were evaluated through the 6-m walk test and the 5-times sit-to-stand test. The research employed either 1 standard deviation below the mean or the 20th percentile of the study group as the criteria for determining the cut-off value.

Results: The mean age for the entire cohort was 52.3 ± 9.2 y with 45.5% female. The reference cut-off values were shown in the following Table.

			A	B
Muscle Mass				
Men	DXA	8.0±1.0[C]	6.9 kg/m^2	7.2 kg/m^2
	BIA	9.2±1.2	8 kg/m^2	8.3 kg/m^2
Women	DXA	6.4±1.0	5.4 kg/m^2	5.4 kg/m^2
	BIA	6.9±0.9	6 kg/m^2	6.1 kg/m^2
Muscle Strength				
Men	Handgrip	41.5±8.0	33.5 kg	35 kg
Women		27.9±5.9	22 kg	22.5 kg
Physical Performance				
Gait speed of the 6-meters walk		1.2±0.1	1.1 m/s	1.1 m/s
5-times sit-to-stand test		8.5±2.4	10.9 s	10.2 s

A. 1 standard deviation below the mean
B. the 20th percentile of the study group
C. mean± standard deviation

Conclusion: In this study, we determined the reference cut-off values of muscle mass, muscle strength and physical performance for adult patients with diabetes. In the future, we will endeavor to establish the reference cut-off values of sarcopenia for general adult population.

P402
COMPARISON OF THE MEAN BONE MINERAL DENSITY AND FRAGILITY SCORE OF THE LUMBAR SPINE ASSESSED WITH RADIOFREQUENCY ECHOGRAPHIC MULTISPECTROMETRY (REMS) BETWEEN WOMEN WITH AND WITHOUT SCOLIOSIS

E. Bischoff[1], F. Bischoff[2], S. Vladeva[3]

[1]Univ. "Prof. Dr. Assen Zlatarov" Burgas, Medical Faculty, [2]Rheumatology practice [3]Trakia Univ., Medical Faculty, Stara Zagora, Bulgaria

Objective: Fragility score (FS) is dimensionless parameter based on the innovative ultrasound examination of the lumbar spine and/or hip using REMS. FS evaluates the bone quality independently of bone density (BMD).
Methods: We assessed the FS of the lumbar spine of 42 women with REMS. Subjects were with mean age of 82 y and range 24–88 y. Women were considered to have scoliosis if their spine had a sideways curvature of at least 10°. Age, weight, height, BMI, BMD, T-score, Z-score and FS were compared between the subjects with and without scoliosis. Independent sample T-test was used to show if there are some statistically significant differences. The data collection was performed with an innovative JAVA tool, developed by Kirilov et al. [1,2].
Results: Women with scoliosis were significantly older (with mean age of 74 y) than those without scoliosis (51 y), $p < 0.001$. Height differed significantly between the two groups, $p = 0.02$ (159 cm for those with scoliosis and 164 cm for those without scoliosis). Weight and BMI didn't show any statistical significance. BMD, T-score and FS differed significantly between the both groups, $p < 0.001$. Women with scoliosis had lower BMD (0.774 g/cm^2), lower T-score (− 2.5 SD) and higher fragility score (58.5) of the lumbar spine compared to those without scoliosis (BMD = 0.945 g/cm^2, T-score = − 1.0 SD and FS = 26.1). Although Z-score didn't show any statistically significance.
Conclusion: Women with scoliosis demonstrated higher fragility score and in this way higher fracture risk.
References:

1. Kirilov N, et al. GMS Publishing House 2023, DocAbstr. 66. https://doi.org/10.3205/23gmds105.
2. Kirilov N. 2020 Industrial Technologies 7, Vol 1, 80–83.

P403
DETECTING LOOSENING OF LOWER EXTREMITY TOTAL JOINT ARTHROPLASTY WITH AN ACCURATE MACHINE LEARNING MODEL FOR CLINICAL DECISION MAKING

E. C. S. Chui[1], K. K. K. Mak[1], R. H. T. Ng[1], E. C. H. Fung[1], M. T. Y. Ong[1], R. M. Y. Wong[1], P. S. H. Yung[1]

[1]Dept. of Orthopaedics and Traumatology, Prince of Wales Hospital, Chinese Univ. of Hong Kong, Hong Kong, SAR China

Objective: Total joint arthroplasty is a common operation for treating knee or hip osteoarthritis (OA). The objective of this study was to develop an accurate machine learning model based on image analysis for detecting loosening of lower extremity total joint arthroplasty implants. The aim was to aid clinical decision making by providing a reliable tool for early detection and diagnosis of implant loosening.
Methods: A comprehensive dataset of image data, including X-rays, MRI and CT scans, was collected for training the machine learning model. The images provided detailed information about the status of the implants. The model was trained using a combination of image processing techniques and machine learning algorithms to accurately identify loosening of the implants.
Results: The developed machine learning loosening model exhibited an accuracy of 90% and a predictability of 0.92 in successfully detecting loosening of lower extremity total joint arthroplasty implants. It demonstrated remarkable proficiency in analyzing the provided image data and swiftly identifying instances of implant loosening. The model's impressive performance holds great promise for facilitating clinical decision-making in the early detection and management of implant loosening.
Conclusion: The novel image-based machine learning model presented in this study offers a reliable and accurate tool for detecting loosening of lower extremity total joint arthroplasty implants. Its high accuracy and predictability can aid clinicians in making informed decisions regarding further examinations or interventions. The model has the potential to improve patient care by enabling early detection and intervention for implant loosening.

P404
DEEP LEARNING NETWORK-BASED SPINE OSTEOPOROSIS DETECTION AND CLASSIFICATION SYSTEM BASED ON SIMULATED STANDARDISED BONE MINERAL DENSITY SCORE

E. C. S. Chui[1], K. K. K. Mak[1], R. H. T. Ng[1], E. C. H. Fung[1], M. T. Y. Ong[1], R. M. Y. Wong[1], P. S. H. Yung[1]

[1]Dept. of Orthopaedics and Traumatology, Prince of Wales Hospital, Chinese Univ. of Hong Kong, Hong Kong, SAR China

Objective: The focus of this specific study was on the implementation of deep learning algorithms for the classification of osteoporosis status using X-ray images of the spine, hip, and wrist. By harnessing the power of deep learning techniques, specifically employing the DenseNet architecture, the researchers aimed to develop a robust and precise algorithm capable of identifying and classifying osteoporosis in X-ray scans from these anatomical regions.
Methods: The study utilized a dataset consisting of 200 spine X-rays, 200 hip X-rays, and 200 wrist X-rays. These X-ray images were collected and curated for the purpose of training and evaluating the algorithm. To develop the classification algorithm, DenseNet was selected due to its ability to effectively capture intricate patterns and features from images. The training process involved feeding the labeled X-ray images into the DenseNet model. The network learned to extract meaningful features from the X-ray images and map them to the corresponding osteoporosis classes.

Results: The study demonstrated a high performance of the developed algorithm in classifying osteoporosis based on X-ray images. The developed algorithm exhibited a strong performance, achieving an impressive accuracy rate of up to 0.86, with a precision of 0.83 and specificity of 0.82. This accuracy metric indicates the proportion of correctly classified X-ray images compared to the total number of images in the dataset.
Conclusion: The application of AI and deep learning techniques to osteoporosis classification based on X-ray scans carries substantial implications for patient care. By accurately identifying individuals with osteoporosis through AI-based classification, healthcare professionals can intervene at earlier stages of the disease, implement tailored treatment plans, and potentially mitigate the potential complications associated with osteoporosis.

P405
INNOVATIVE WORKFLOW FOR THE IDENTIFICATION OF CATHEPSIN K CLEAVAGE SITES IN TYPE I COLLAGEN

J. J. Demeuse[1], P. Massonnet[2], M. Schoumacher[1], E. Grifnée[2], L. Huyghebaert[2], T. Dubrowski[2], S. Peeters[2], C. Le Goff[2], E. Cavalier[1]

[1]Univ. of Liège, [2]Univ. Hospital of Liège, Liège, Belgium

Objective: In this work, we propose a degradomics mass spectrometry-based workflow that combines protein digestion, Nano-LC-UDMS^E, and several software tools to identify cathepsin K cleavage sites.
Methods: Type I collagen standards were subjected to digestion by cathepsin K at various protein/enzyme ratios for different incubation times. The digested proteins were subsequently injected into the nanoAQUITY UPLC-system Nano-LC (Waters). Chromatographic separation was accomplished using a nanoEaseTM M/Z HSS T3, 100 Å, 1.8 µm, 300 µm × 150 mm Column (Waters). The identification of peptides was conducted using PEAKS X, employing a combination of database searching and de novo sequencing.
Results: This workflow not only identified previously known cleavage sites, but also discovered new ones. Multiple cleavage hotspots were found and described in type I α1 and type I α2 collagen, many of which coincided with pyridinoline crosslinks, known to stabilize the triple helix. Our results allowed us to establish a chronology of digestion and conclude that cathepsin K preferentially cleaves the extremities of type I collagen before the helical part. We also found that cathepsin K preferentially cleaves amino acid residues with long and hydrophobic lateral chains at the beginning of digestion, whereas no preferred amino acid residues were identified later in the digestion.
Conclusion: Our workflow successfully identified new cleavage sites and can be easily applied to other proteins or proteases.

P406
CONFOUNDING FACTORS OF THE EXPRESSION OF MTBI BIOMARKERS, S100B, GFAP AND UCH-L1, IN AN AGING POPULATION

E. Calluy[1], C. Beaudart[2,3], M. S. Alokail[4], N. M. Al-Daghri[5], O. Bruyère[2,6], J.-Y. Reginster[2,7], E. Cavalier[1], A. Ladang[1]

[1]Clinical Chemistry Dept., CHU de Liège, Univ. of Liège, Liège, Belgium, [2]WHO Collaborating Center for Public Health Aspects of Musculoskeletal Health and Aging, Division of Public Health, Epidemiology and Health Economics, Univ. of Liège, Liège, Belgium, [3]Clinical Pharmacology and Toxicology Research Unit (URPC), NARILIS, Dept. of Biomedical Sciences, Faculty of Medicine, Univ. of Namur, Namur, Belgium, [4]Protein Research Chair, Biochemistry Dept, College of Science, KSU, Riyadh, Saudi Arabia, [5]Chair for Biomarkers of Chronic Diseases, Biochemistry Dept., College of Science, KSU, Riyadh, Saudi Arabia, [6]Dept. of Sport and Rehabilitation Sciences, Univ. of Liège, Liège, Belgium, [7]Protein Research Chair, Biochemistry Dept., College of Science, King Saud Univ., Riyadh, Saudi Arabia

Objective: Mild traumatic brain injury (mTBI) is one of the most common conditions seen in emergency departments. Recently, guidelines have proposed the combined use of the measurement of biomarkers, namely S100b and the "GFAP-UCH-L1" mTBI test to rule out mTBI. As older adults are the most at risk for mTBI, this study evaluates confounding factors that influence the concentration of S100 Calcium Binding protein B (S100B), Glial Fibrillary Acidic Protein (GFAP), and Ubiquitin carboxyl-Terminal Hydrolase L-1 (UCH-L1) in older individuals.
Methods: The protein S100B and the "GFAP and UCH-L1" mTBI test were measured using Liaison XL (Diasorin) and Alinity I (Abbott), in 330 and 341 individuals with non-suspected mTBI from the SarcoPhAge cohort, respectively.
Results: S100B, GFAP and UCH-L1 were all significantly correlated with renal function while alcohol consumption, geriatric depression score (GDS), smoking habits and anticoagulant intake were not associated with any of those 3 biomarkers. BMI and age were associated with GFAP and UCH-L1 expression while sex and mini-mental state examination (MMSE) were only associated with GFAP. Additionally, according to the manufacturers' cut-offs for mTBI rule-out, only 5.5% of the subjects were positive for S100B whereas 66.9% were positive for the "GFAP-UCH-L1" mTBI test. All "GFAP-UCH-L1" mTBI positive tests were GFAP + /UCH-L1−. Among individuals with cystatin C > 1.55 mg/L, 25% were positive for S100b whereas 90% were positive for the mTBI test.
Conclusion: Our data show that confounding factors have a different impact on the positivity rate of the "GFAP-UCH-L1" mTBI test compared to S100B.

P407
ANATOMICAL DISTRIBUTION OF WORK-RELATED MUSCULOSKELETAL DISORDERS AMONG NURSES IN A HELLENIC AIR FORCE HOSPITAL GREEK HOSPITAL

S. Naoum[1], E. Chronopoulos[2], M. Kotsapas[3], D. Kotzias[1], K. Alpantaki[4], V. Giovanoulis[5], M. Piagkou[6], C. Koutserimpas[1]

[1]Dept. of Orthopaedics and Traumatology, "251" Hellenic Air Force Hospital, Athens, Greece, [2]Laboratory for Research of the Musculoskeletal System, School of Medicine, National and Kapodistrian Univ. of Athens, Athens, Greece, [3]General Hospital of Naousa, Orthopedic Dept., Naousa, Greece, [4]Dept. of Orthopaedics and Traumatology, "Venizeleion" General Hospital, Heraklion, Greece, [5]Dept. of Pediatric Orthopaedic Surgery, Robert Debré Univ. Hospital, Assistance Publique des Hôpitaux de Paris (AP-HP), Paris, France, [6]Dept. of Anatomy, School of Medicine, National and Kapodistrian Univ. of Athens, Athens, Greece

Objective: Nurses, as health professionals, are at high risk of work-related musculoskeletal disorders (WRMDs). The purpose of this prospective study was to record the anatomical distribution of the WRMDs and to evaluate the association between reported WRMDs and perceived caring behaviors in the nursing personnel in the Hellenic Air Force Hospital of Athens, Greece.
Methods: A total of 350 questionnaires were completed from 1 December 2022 to 30 March 2023. The Nordic Musculoskeletal Questionnaire for the evaluation of WRMSDs and the Caring Behaviors Inventory-24 (CBI-24) for the assessment of caring behaviors were used.

Results: At least one WRMSD was recorded to 259 participants (74%). Regarding the anatomical distribution of WRMD, low back (64.3%), neck (63.2%) and shoulder (58.4%) were the most common anatomical regions. The mean score of the CBI-24 scale was 5.06, while the mean "Connectedness" parameter was 4.59. Elbow WRMDs were significantly correlated with the lowest score in the "Knowledge and skills" parameter, as well as with the lowest overall nursing score. Linear regression analysis revealed that the lowest nursing care score was associated with the left-handed nurses of low hierarchical position, suffering from elbow WRMDs. Participants who continued working on regular basis despite their WRMDs, showed lower mean score on the parameters of "Respectful" and "Connectedness".
Conclusion: Nurses showed high percentage of WRMDs that negatively affected their perceived dimensions of caring behaviors. The most commonly affected anatomical region was the lower back. These findings could be used to prevent and deal with WRMSDs, reduce occupational hazards and improve hospital patient care.

P408
ANATOMY OF THE ARTIFICIAL HIP JOINT: SIZING AND BIOMECHANICS OF A NEW THREADED ACETABULUM COMPONENT

N. Christodoulou[1], K. Raptis[2], M. Piagkou[3], D. Kotzias[2], S. Naoum[2], E. Chronopoulos[4], C. Koutserimpas[2]

[1]Dept. of Orthopedics, Athens Medical Group, [2]Dept. of Orthopaedics and Traumatology, "251" Hellenic Air Force Hospital, [3]Dept. of Anatomy, School of Medicine, National and Kapodistrian Univ. of Athens, [4]Laboratory for Research of the Musculoskeletal System, School of Medicine, National and Kapodistrian Univ. of Athens, Athens, Greece

Objective: The uncemented threaded DELTA ST C cup was introduced in last few years. It has a hemispheric shell, consisting of Ti6Al4V titanium alloy. The purpose of the study was to assess the sizing of the acetabulum component, as well as the bone stock quality in patients undergoing total hip arthroplasty (THA).
Methods: The present study is a retrospective observational cohort study of a prospectively maintained database, evaluating 620 patients undergoing THA with the DELTA ST-C cup. Age, affected hip, primary diagnosis, bone stock quality and size of the acetabulum prosthesis were evaluated.
Results: The enrolled population's mean age was 69.3 y and most patients were female (64%). The affected side was the right hip in 287 (43.6%), while 333 (56.7%) patients replaced their left hip. Primary diagnosis was osteoarthritis in 437 patients (70.5%), avascular necrosis in 85 (13.7%), congenital or acquired deformity in 46 (7.4%), Fracture of the femoral neck in 46 (7.4%) and post-traumatic arthritis in 6 (1%). Regarding the bone stock quality of the acetabulum, it was normal in 555 (89.5%) while in 65 (10.5%) was porotic. As for the acetabular cup size, 50 mm was the mostly used (196;31.6%), followed by 52 mm (104;16.8%), 48 mm (85;13.7%), 54 mm (78;12.6%), 56 mm (59;9.5%), 46 mm (33;5.3%) 58 mm (26;4.2%), 44 mm and 60 mm (20;3.2%), respectively.
Conclusion: DELTA ST-C cup has recently been used in Greece and this is the first study aiming to record the size of this prosthesis in a sample of the south-eastern European, Greek population. Most DELTA ST-C cups were used for osteoarthritis management and the most commonly size used was 50 mm.

P409
SIZING AND BIOMECHANICS OF A NEW MINIMAL FEMORAL STEM: A RETROSPECTIVE OBSERVATIONAL COHORT STUDY

N. Christodoulou[1], M. Piagkou[2], K. Raptis[3], S. Naoum[3], D. Kotzias[3], E. Chronopoulos[4], C. Koutserimpas[3]

[1]Dept. of Orthopedics, Athens Medical Group, [2]Dept. of Anatomy, School of Medicine, National and Kapodistrian Univ. of Athens, [3]Dept. of Orthopaedics and Traumatology, "251" Hellenic Air Force Hospital, [4]Laboratory for Research of the Musculoskeletal System, School of Medicine, National and Kapodistrian Univ. of Athens, Athens, Greece

Objective: The MINIMA S stem was developed according to the principles of proximal-loading and extended metaphyseal geometry applied to a short stem. The purpose of the study was to assess demographics, the stem size as well as bone stock quality in patients undergoing total hip arthroplasty (THA).
Methods: The present study is a retrospective observational cohort study of a prospectively maintained database, evaluating 570 patients undergoing THA with the MINIMA S stem. Age, affected hip, primary diagnosis, bone stock quality and size of the stem were evaluated.
Results: The enrolled population's mean age was 69.3 y and most patients were female (64%). The affected side was the right hip in 249 (43.6%), while 321 (56.7%) patients replaced their left hip. Primary diagnosis was osteoarthritis in 402 patients (70.5%), avascular necrosis in 78 (13.7%), congenital or acquired deformity in 42 (7.4%), fracture of the femoral neck in 42 (7.4%) and post-traumatic arthritis in 6 (1%). Regarding the bone stock quality of the acetabulum, it was normal in 510 (89.5%) while in 60 (10.5%) was porotic. As for the size of the stem, no.6 was the mostly used (102;17.9%), followed by no.5 (84;14.7%), no.2 and no.4 (66;11.6%), no.7 (60;10.5%), no.3 (54;9.5%), no.8 (48;8.4%) no.1 (42;7.4%), no.9 (24;4.2%) no.10 (18;3.2%) and no.11 (6;1%).
Conclusion: The MINIMA S stem has recently been used in Greece and this is the first study aiming to record the size of this prosthesis in a sample of the Greek population. Most MINIMA S stems were used for osteoarthritis management and the most commonly size used was no.6.

P410
ANATOMICAL DISTRIBUTION OF HIP FRACTURES IN A TERTIARY GREEK HOSPITAL: A RETROSPECTIVE ANALYSIS OF 4000 ELDERLY PATIENTS OVER 65 YEARS OLD

K. Alpantaki[1], C. Chaniotakis[1], S. Naoum[2], D. Kotzias[2], E. Chronopoulos[3], K. Dretakis[4], M. Piagkou[5], C. Koutserimpas[2]

[1]Dept. of Orthopaedics and Traumatology, "Venizeleion" General Hospital, Heraklion, [2]Dept. of Orthopaedics and Traumatology, "251" Hellenic Air Force Hospital, Athens, [3]Laboratory for Research of the Musculoskeletal System, School of Medicine, National and Kapodistrian Univ. of Athens, Athens, [4]2nd Dept. of Orthopaedics, "Hygeia" General Hospital of Athens, Athens, [5]Dept. of Anatomy, School of Medicine, National and Kapodistrian Univ. of Athens, Athens, Greece

Objective: Hip fractures are considered a principal cause of morbidity and mortality among patients over the age of 65 years. The aim of the study is to evaluate the characteristics of elderly patients with hip fractures and the anatomical distribution of intracapsular and extracapsular hip fractures among genders and age groups treated surgically.

Methods: In this nine-year retrospective cohort study, the type of hip fractures, age, and the overall incidence among 4000 patients aged over 65, surgically treated at the "Venizeleio" General Hospital of Heraklion, Crete, Greece, were evaluated.
Results: Hip fractures were more frequent in women (× 2.9) rather than men. Most of the patients suffering from a hip fracture were over 75 years of age (62.3% in females and 59.3% in males). Regarding the anatomical distribution, the proportion of extracapsular and intracapsular fractures were 59.6% and 40.4% in men and 62.7% and 37.2% in women, respectively. Extracapsular fractures were found to increase dramatically with age in women (from 52.3% in patients younger than 75 compared to 58.8% in those older than 75), while in men they slightly increased with age (57.7% in patients older than 75, compared to 55.7% in those less than 75).
Conclusion: The pattern of hip fractures was found to differ between genders and age groups in the present patients' population. Most likely, these findings reflect differences in the nature and rate of bone loss, and frequency of falling events between males and females. The present findings have shown that the anatomical pattern of hip fractures among Cretan elderly is not different from other Western societies.

P411
SUBTROCHANTERIC FATIGUE FRACTURE OF BOTH SIDES IN A MILITARY CADET

C. Koutserimpas[1], M. Piagkou[2], S. Naoum[1], M. Kotsapas[3], D. Kotzias[1], K. Raptis[1], E. Veizi[4], K. Alpantaki[5], K. Dretakis[6], E. Chronopoulos[7]

[1]Dept. of Orthopaedics and Traumatology, "251" Hellenic Air Force Hospital, Athens, Greece, [2]Dept. of Anatomy, School of Medicine, National and Kapodistrian Univ. of Athens, Athens, Greece, [3]General Hospital of Naousa, Orthopedic Dept., Naousa, Greece, [4]Dept. of Orthopedics and Traumatology, Ankara City Hospital., Ankara, Turkey, [5]Dept. of Orthopaedics and Traumatology, "Venizeleion" General Hospital, Heraklion, Greece, [6]2nd Dept. of Orthopaedics, "Hygeia" General Hospital of Athens, Athens, Greece, [7]Laboratory for Research of the Musculoskeletal System, School of Medicine, National and Kapodistrian Univ. of Athens, Athens, Greece

Objectives Fatigue fractures are caused by a great variety of activities. A relatively common anatomical region of fatigue fractures is femur, representing approximately 11% of all these injuries. Nevertheless, simultaneous fatigue fractures of both femurs are considered to be an extremely rare clinical entity. This study consists of a case report of a male cadet with subtrochanteric fatigue fractures of both femurs.
Methods: An 18-year-old male cadet presented to the emergency department due to bilateral thigh pain. Clinical evaluation revealed diffuse bilateral thigh pain and mild swelling; hip flexion was minor weaker bilaterally. X-rays showed bilateral radiolucent signs in the medial cortex of both femurs at the subtrochanteric area. The serum laboratory examination was within normal limits Moreover, findings of mild bone oedema and increased radiotracer uptake were present at MRI and bone scintigraphy, respectively, at the medial cortex of the subtrochanteric area of both femurs.
Results: The diagnosis of bilateral fatigue femoral fractures was established. The patient was managed conservatively, since both fractures were incomplete and non-displaced. It was recommended that the patient protect weight bearing for 6 weeks and start gradual increase in activities. He could return to his military training after 3 months.
Conclusion: The typical symptoms of fatigue femoral fractures usually include pain, tenderness, and oedema in the thigh or groin area. However, since there is no traumatic history, these injuries might be misdiagnosed. MRI examination is considered to be the most sensitive and effective imaging method for early detection of these fractures, depicting bone marrow and/or periosteal or soft tissue oedema, while the fracture could be revealed in T1 weighted images.

P412
CAN SPONDYLODISCITIS LEAD TO DEVICE RELATED ENDOCARDITIS?

C. Koutserimpas[1], S. Naoum[1], E. Veizi[2], V. Giovanoulis[3], D. Kotzias[1], K. Raptis[1], K. Dretakis[4], K. Alpantaki[5], M. Piagkou[6], E. Chronopoulos[7]

[1]Dept. of Orthopaedics and Traumatology, "251" Hellenic Air Force Hospital, Athens, Greece, [2]Dept. of Orthopedics and Traumatology, Ankara City Hospital., Ankara, Turkey, [3]Dept. of Pediatric Orthopaedic Surgery, Robert Debré Univ. Hospital, Assistance Publique des Hôpitaux de Paris (AP-HP), Paris, France, [4]2nd Dept. of Orthopaedics, "Hygeia" General Hospital of Athens, Athens, Greece, [5]Dept. of Orthopaedics and Traumatology, "Venizeleion" General Hospital, Heraklion, Greece, [6]Dept. of Anatomy, School of Medicine, National and Kapodistrian Univ. of Athens, Athens, Greece, [7]Laboratory for Research of the Musculoskeletal System, School of Medicine, National and Kapodistrian Univ. of Athens, Athens, Greece

Objective: Cardiac device-related endocarditis (CDRIE) is not a rare infection, while its diagnosis and management may be difficult. This study presents a case report with a complication of CDRIE, with a history of a previously eight-week spondylodiscitis.
Methods: A 72-year-old female presented with symptoms of intense back pain and spine MRI revealed spondylodiscitis of the 11th and 12th thoracic vertebrae, while both blood and sample cultures were negative. The patient was treated with empirical antibiotic therapy with intravenous daptomycin and meropenem, for 40 days, with successful clinical outcome. Eight weeks after the spondylodiscitis onset, signs of pocket infection were noted, including skin erythema, pain, edema, and purulent drainage in the pocket area, without symptoms of systemic infection. Transesophageal echocardiography did not reveal signs of endocarditis.
Results: PET/CT was performed, revealing an increased uptake from the pacemaker generator and the electrodes, signs indicative of CDRIE. The pacemaker was removed and a temporary one was fitted. Polymerase chain reaction (PCR) examination of several parts of the device revealed Corynebacterium spp, treated with vancomycin based on sensitivity testing for 40 days with a successful outcome.
Conclusion: CDRIE and spondylodiscitis are closely associated infections. Clinicians should be aware and suspicious for CDRIE in patients with spondylodiscitis, ordering the most appropriate exams and test for diagnosis and early treatment. Due to the fact that laboratory tests and cultures occasionally may not be helpful, PET/CT could be a quite important tool for the diagnostic procedure.

P413
MODIFIED ANTEROLATERAL MINIMALLY INVASIVE SURGERY (ALMIS) FOR TOTAL HIP RECONSTRUCTION

C. Koutserimpas[1], M. Piagkou[2], S. Naoum[1], D. Kotzias[1], I. Karaiskos[3], K. Kourelis[3], K. Raptis[1], E. Chronopoulos[4]

[1]Dept. of Orthopaedics and Traumatology, "251" Hellenic Air Force Hospital, [2]Dept. of Anatomy, School of Medicine, National and Kapodistrian Univ. of Athens, [3]Dept. of Orthopedics and Traumatology, "251" Hellenic Air Force General Hospital, [4]Laboratory for Research of the Musculoskeletal System, School of Medicine, National and Kapodistrian Univ. of Athens, Athens, Greece

Objective: To report the clinical outcomes as well as the complications from the ALMIS approach for total hip arthroplasty (THA).
Methods: The present study is a single-center retrospective observational cohort of 520 patients undergoing the ALMIS technique. The patients were followed-up for a minimum of 5 y. The time-period of the study was from January 2014 until December 2018, including all patients undergoing THA with the modified ALMIS at the Dept. of Orthopaedics at the 251 Hellenic Air Force General Hospital of Athens, Greece. Patients' demographics, including gender and age, as well as length of in-hospital stay (LOS) and transfusion rate were recorded. Range of motion (ROM), Harris hip score (HHS), Trendelenburg sign and surgery related complications were also evaluated.
Results: A total of 520 patients with a mean follow-up period of 6.6 y were enrolled in the study. The mean LOS was 3.01 d (SD 1.2) and a total of 6 (1.2%) patients required postoperative transfusion with one blood unit each. At the final follow-up, mean adduction was 23° (compared to 14.8° preoperatively; $p < 0.0001$), mean abduction 26.9° (17.8° preoperatively; $p < 0.0001$), mean flexion 121.5° (74.2° preoperatively; $p < 0.0001$), mean external rotation 25.1° (11.1° preoperatively; $p < 0.0001$) and mean internal rotation 18.6° (8.1° preoperatively; $p < 0.0001$). The median HSS at the final follow-up was 93, compared to the 45 preoperatively (p-value < 0.0001). In early postoperative period 37 patients (7.1%) had Trendelenburg sign with a mean of 5.7° (SD 1.4), but following rehabilitation, it was ameliorated and finally was permanent only in 2 cases. The mean satisfaction rate (1–10) was 9.3.
Conclusion: ALMIS hip approach is a modified surgical technique providing good visibility during acetabulum and femur preparation, revealed excellent clinical outcomes during midterm follow-up, by significantly improving hip range of motion and the HHS. Careful utilization of this technique, after adequate training should yield favorable outcomes, while minimal major complications should be expected.

P414
FACTORS AFFECTING PERSISTENCE OF DENOSUMAB TREATMENT IN PATIENTS WITH OSTEOPOROSIS: A RETROSPECTIVE COHORT STUDY

E. Costa[1], S. Paredes[1], D. Taverner[1], A. Pàmies[2], C. Tomas[3], D. Llop[4], C. Llop[5]

[1]Rheumatology Hospital Universitari Sant Joan de Reus, Reus, [2]Rheumatology Hospital Verge de la Cinta, Tortosa, [3]Rheumatology Hospital Comarcal de Amposta, Amposta, [4]Universitat Rovira i Virgili, Reus, [5]Pharmacy, Servei Català de la Salut, Tarragona, Spain

Objectives: Perseverance in pharmacological treatment for osteoporosis is a key factor in fracture prevention. Denosumab has demonstrated superior persistence compared to other anti-osteoporotic drugs in previous studies. Patient related factors may influence treatment persistence. We aimed to describe the characteristics of a cohort of patients undergoing denosumab treatment. To assess clinical and/or demographic characteristics that are significantly associated with treatment persistence.
Methods: Patients diagnosed with osteoporosis aged over 50, visited in Rheumatology outpatient clinics of three hospitals in Tarragona, who were prescribed denosumab between January 2013 and December 2023 and had received at least two doses of denosumab. Clinical and demographic data were collected from the patients' medical records. Logistical regression analysis was conducted to examine the relationship between different factors and treatment persistence. The variables studied included age, gender, polypharmacy, Charlson index, cognitive status, fracture risk, use of psychoactive drugs, previous osteoporotic fractures and previous osteoporosis treatments.
Results: A total of 854 patients were recruited. Patients lost to treatment due to death (130 patients) and withdrawal due to improvement according to medical criteria (108) were excluded. 616 patients were analyzed. The characteristics of these patients are shown in Table 1. A total of 468 patients continued with treatment (76%) while 148 discontinued it (24%). The mean follow-up time was 59 months (minimum 12–maximum 144). Variables significantly associated with lower treatment discontinuation were previous osteoporosis treatment (OR = 0.67; CI 0.48–0.93); polypharmacy with 5–10 drugs (OR 0.66; CI 0.45–0.95); polypharmacy with more than 10 drugs (OR 0.6; CI 0.37–0.97). The variable significantly associated with higher discontinuation was dementia (OR 1.96; CI 1.34–2.89).

Table 1. Characteristics of the analyzed population

	N = 616
Age (median, IQR)	81 (74 – 87)
Sex (n women, %)	560, 90.90%
Cognitive state (n, %)	
- Good	470, 76.30%
- Mild dementia	115, 18.66%
- Moderate dementia	30, 4.87%
Densitometry at diagnosis (yes, %)	416, 67.53%
Column densitometry values T-score (median, IQR)	-3.10 (-3.70 - -2.37)
Hip densitometry values T-score (median, IQR)	-2.50 (-2.90 - -1.90)
Vitamin D values before starting treatment ng/dl (median, IQR)	33.80 (28 – 44)
Osteoporosis risk (n, %)	
- High	263, 42.69%
- Very high	353, 57.31%
Charlson index (median, IQR	4 (3 – 6)
Psychoactive drugs (yes, %)	311, 50.49%
Corticoids (n, %)	
- Up to 5 mg prednisone	63, 10.22%
- More than 5 mg prednisone	27, 4.38%
- No	524, 85.06%
Polypharmacy (n, %)	
- Up to 5 different drugs	205, 33.28%
- Between 5 and 10	293, 47.56%
- More than 10	116, 18.83%
Previous osteoporotic fracture (n, %)	
- Other fractures	23, 3.73%
- Hip	122, 19.81%
- Vertebral	204, 33.11%
- No	186, 30.19%
Previous osteoporosis treatment (n, %)	
- IV Bisphosphonates	25, 4.06%
- Oral bisphosphonates	213, 34.58%
- Teriparatide	102, 16.56%
- No	274, 44.48%

Conclusion: The studied cohort comprises an aging population with high comorbidity, a significant presence of dementia, and polypharmacy. Denosumab treatment persistence is significantly influenced by patient's cognitive status, use of more than 5 drugs, and having received previous osteoporosis treatments. These factors should be considered when initiating long-term treatments, reevaluating the type of treatment, and reinforcing follow-up for these patients.

P415
VITAMIN D LEVEL IN PATIENTS WITH EARLY RHEUMATOID ARTHRITIS

E. Deseatnicova[1], L. Groppa[1], M. Curchi[1], E. Rusu[1]

[1]State Medical and Pharmaceutical Univ. Nicolae Testemitanu, Chisinau, Moldova

Objective: To determine vitamin D level as a function of disease activity in patients with early rheumatoid arthritis.
Methods: We investigated 50 patients with early rheumatoid arthritis and 50 healthy persons in control group matched by age and sex for serum 25(OH)vitamin D level (chemiluminescence immunoassay, serum). Deficiency was defined as < 20 ng/ml, severe deficiency as < 10 ng/ml. Simultaneously clinical and laboratory data were obtained to asses disease activity by DAS28-CRP index. Mean age of the patients was 53.12 ± 5.62 y.o., mean duration of rheumatoid arthritis symptoms was 9.8 ± 1.6 weeks. All the patients were rheumatoid factor and/or anti-CCP positive. The data were analyzed statistically.
Results: This observational case control study showed significantly lower mean 25(OH)vitamin D level in patients with early rheumatoid arthritis compared to healthy individuals, 14.2 ± 4.53 ng/ml vs. healthy controls 28.3 ± 6.58, $p < 0.001$. Severe deficiency was determined in 12.8% of cases of rheumatoid arthritis. Mean DAS28-CRP was 4.8 ± 0.36. High disease activity index correlated negatively with 25 (OH) vitamin D level, $r = -0.62$, $p < 0.001$. Severity of vitamin D deficiency correlated positively with the anti-CCP level, $r = 0.38$, $p < 0.05$.
Conclusion: Patients with early rheumatoid arthritis in our study had 25(OH)vit D deficiency in about 60% of cases. It correlated negatively with disease activity and positively with serum anti-CCP level. Early screening for vitamin D deficiency and its correction is highly recommended.

P416
ROLE OF VITAMIN D SUPPLEMENTATION IN THE MANAGEMENT OF PATIENTS WITH OSTEOARTHRITIS OF THE KNEE

M. Curchi[1], E. Deseatnicova[1], L. Groppa[1], A. Pascari-Negrescu[1]

[1]State Medical and Pharmaceutical Univ. Nicolae Testemitanu, Chisinau, Moldova

Objective: Vitamin D deficiency is a common problem worldwide. Optimal active vitamin D level is required for the metabolism and function of the osteoarticular and neuromuscular system. Normal vitamin D level was shown to reduce the risk of many chronic diseases. Low serum 25OH vitamin D levels are frequently found in osteoarthritis patients. We aimed to study the effect of vitamin D supplementation on clinical manifestations in knee OA.
Methods: Observational, case–control study of 70 patients with knee osteoarthritis radiological stage II according to Kellgren–Lawrence and vitamin D deficiency, divided into 2 equal groups. The patients of both groups received meloxicam 15 mg/d 1 month, local ointment diclofenac 50 mg/g 3 FTU (fingertip unit) per day, chondroitin sulfate 1500 mg + glucosamine sulfate 1500 mg/d 3 months. Group I patients were supplemented with cholecalciferol having vitamin D target level—50 ng/dl in 3 months, the dosage was calculated using web based calculator from Grassrootshealthnet project, group II no supplementation. In 3 months, patients of both groups were subjects of active supplementation.
Results: BMI—29.13 (95% CI 31.08–24.83) vs. 27.74 (95% CI 29.38–24.51) kg/m^2, $p > 0.05$. Patients of both sexes had no significant differences between vitamin D values (17.01 ± 5.15 ng/dl) and (17.74 ± 4.03 ng/dl) ($p = 0.862$). Patients with severe vitamin D deficiency < 10 ng/dl were 11.3%. The level of 25(OH) vitamin D at the end of the study- group I 36.72 ± 10.39 (95% CI 57.23–31.07) vs. group II 17.1 ± 6.2 (95% CI 12.67–26.14) ng/dl, $p < 0.05$. Pain by VAS group I was statistically significantly lower 3.2 ± 2.7 (95% CI 6.91–3.04) vs. 6.1 ± 1.3 (95% CI 8.32–4.29) ($p < 0.05$).
Conclusion: Supplementation and correction of serum vitamin D levels till middle optimal may be recommended for combination therapy and pain management in patients with knee OA.

P417
BONE MINERAL DENSITY IN PATIENTS WITH JUVENILE IDIOPATHIC ARTHRITIS

E. Dunayeva[1], A. Pachkaila[1], V. Vadzianava[1]

[1]Institute of Advanced Training and Retraining of Healthcare Personnel of Belarusian State Medical Univ., Minsk, Belarus

Objective: Juvenile idiopathic arthritis (JIA) is the most common rheumatic disease in children. JIA may be accompanied by a decrease in BMD and even the development of osteoporosis, especially in children with high disease activity or taking systemic glucocorticoids (GS).
Methods: 76 children (28 boys and 48 girls) with JIA aged 3–17 y participated in study. The median age of patients was 12.8 y (9.8; 14.6). The BMD study was carried out using DXA according to pediatric research programs (total body less head (TBLH) and lumbar spine (L1–L4)). BMD (g/cm^2) and BMD Z-score were analyzed. Z-score BMD values ≤ -2 SD were regarded as low BMD; osteoporosis was diagnosed in patients with a clinically significant history of fractures in combination with a Z-score BMD ≤ -2.0 SD or in children with vertebral compression fractures at the absence of a local pathological process or high-energy injury, regardless of BMD indicators (Official position in Pediatrics of the International Society of Clinical Densitometry, 2019).
Results: In the group of examined patients, the average TBLH BMD was 0.715 (0.618; 0.805) g/cm^2, TBLH Z-score 0.45 ($-$ 0.7; 1.475) SD, the average L1–L4 BMD was 0.626 (0.521; 0.785) g/cm^2, the average Z-score L1–L4 was $-$ 0.6 ($-$ 1.5; 0.2) SD. Normal BMD was detected in 84.2% (64/76) of the examined patients; low BMD was diagnosed in 11.9% (9/76) of children; osteoporosis was diagnosed in 3.9% (3/76) of patients (all these patients took systemic GS and had vertebral fractures).
Conclusion: Low BMD and osteoporosis were diagnosed in 15.8% of examined children with JIA. It is advisable to include BMD monitoring and spine imaging in the routine examination plan for children with JIA to detect low BMD early and to increase the effectiveness of measures to prevent osteoporosis in these patients.

P418
MODELLING FUTURE BONE MINERAL DENSITY: SIMPLICITY OR COMPLEXITY?

E. E.[1], J. Carey[2], T. Wang[3], M. Ebrahimiarjestan[4], L. Yang[5], M. Dempsey[6], M. Yu[4], W. Chan[7], B. Whelan[2], C. Silke[2], M. O'Sullivan[8], B. Rooney[9], A. Mcpartland[10], G. O'Malley[2], A. Brennan[11]

[1]School of Management, Guangxi Minzu Univ., Nanning, China, [2]School of Medicine, College of Medicine, Nursing and Health Sciences, Univ. of Galway, Galway, Ireland, [3]Nuffield Dept. of Medicine, Univ. of Oxford, Oxford, UK, [4]Dept. of Industrial Engineering, Tsinghua Univ., Beijing, China, [5]Insight SFI Research Centre for Data Analytics, Data Science Institute, Univ. of Galway, Galway, Ireland, [6]School of Engineering, College of Science and

Engineering, Univ. of Galway, Galway, Ireland, [7]Dept. of Radiology, Wan Fang Hospital, Taipei Medical Univ., Taipei, Taiwan, [8]Univ. of Galway, Galway, Ireland, [9]Dept. of Geriatric Medicine, Sligo Univ. Hospital, Sligo, Ireland, [10]Dept. of Rheumatology, Our Lady's Hospital, Manorhamilton, Co. Leitrim, Manorhamilton, Ireland, [11]School of Computer Science, College of Science and Engineering, Univ. of Galway, Galway, Ireland

Objective: Osteoporotic fractures are a major global public health issue, driving up patient suffering and the expense of healthcare globally. BMD measurement is important to identify those with osteoporosis and assess their risk of fracture. This risk is related to both the absolute BMD and the change in this value over time. Predicting future BMD in individual patients is challenging which impacts clinical decisions such as when to intervene or repeat BMD measurement. Effective tools to support clinical practice are lacking.
Methods: We compared simple and complex deep learning models generated from longitudinal data collected on subjects with 2 or more hip DXA scans on the same machine between 2000–2018. A simple Z-score based method (ZBM) was used to predict an individual's BMD at their next scan based on the mean BMD and the standard deviation of the reference group, while a random forest (RF) model used time between scans and baseline DXA scan information. A more complex deep learning (DL)-based model was developed to cope with multidimensional longitudinal data, variables extracted from patients' baseline DXA scan, as well as features drawn from the ZBM model.
Results: 2948 white adults aged 40–90 y met our study inclusion: 2652 (90%) females and 296 (10%) males. Our hybrid DL model performed significantly better than the ZBM and RF in women. In contrast, the ZBM outperformed other models in men.
Conclusion: DL-based and statistical models have potential to forecast future BMD using longitudinal clinical data. These methods have potential to augment clinical decisions for when to repeat BMD testing in the assessment of osteoporosis.

P419
VALIDATION OF A NOVEL SCREENING TOOL FOR OSTEOPOROSIS: THE DXA MAP PROJECT

E. E.[1], J. Carey[2], L. Yang[3], T. Wang[4], C. Silke[2], M. O'Sullivan[5], A. Brennan[6], M. Dempsey[7], M. Ebrahimiarjestan[8], M. Yu[8], B. Whelan[2]

[1]School of Management, Guangxi Minzu Univ., Nanning, China, [2]School of Medicine, College of Medicine, Nursing and Health Sciences, Univ. of Galway, Galway, Ireland, [3]Insight SFI Research Centre for Data Analytics, Data Science Institute, Univ. of Galway, Galway, Ireland, [4]Nuffield Dept. of Medicine, Univ. of Oxford, Oxford, UK, [5]Univ. of Galway, Galway, Ireland, [6]School of Computer Science, College of Science and Engineering, Univ. of Galway, Galway, Ireland, [7]School of Engineering, College of Science and Engineering, Univ. of Galway, Galway, Ireland, [8]Dept. of Industrial Engineering, Tsinghua Univ., Beijing, China

Objective: Ireland has one of the highest illness burdens related to osteoporosis in Europe, but there is no national strategy to address this disease. Clinical guidelines recommending DXA scans for older adults with fractures or major risk factors are widely endorsed, but guidelines for screening healthy adults, particularly men, are not. The Osteoporosis Self-assessment Test-index (OSTi) is one of the simplest and most widely validated tools worldwide to identify men and women with osteoporosis. Several studies show this algorithm may outperform more complex tools including FRAX® for this purpose, but yet it is rarely used in clinical practice. Better screening tests are needed. The DXA MAP (Management Application Process) Project is a Health Research Board funded initiative to develop novel ways to improve DXA resource use. In this study we evaluated the performance of the DXA MAP tool and compared it to the OSTi tool among 'healthy' Irish adults referred for a DXA scan in the West of Ireland.
Methods: Cross-sectional study of patients referred for a DXA scan in West of Ireland. Collection and analyses of data for this study was approved by Institutions Ethics Committees. Combinations of age, gender, height and weight were examined using logistic regression and deep learning methods to derive a best fit model to identify those with a DXA diagnosis of 'osteoporosis' (T-score ≤ -2.5) at the femoral neck. Total hip BMD was later assessed in sensitivity analyses. We used accuracy, AUC, F1 and Mathews correlation coefficient to assess algorithm performance.
Results: 6729 (18.5%) of 36,321 white adults aged $\geq$ 20 y had a hip DXA available who had no prior fracture or other clinical risk factors for osteoporosis other than age. Included subjects were randomly divided into a derivation cohort (70%) and a validation cohort (30%). Mean age of both groups was 61.5 y (SD: 13), the majority of whom (> 87%) were female. Mean femoral neck T-score was -1.0 and mean OSTi was -1.9. In univariate analyses age and weight were the most important discriminators of osteoporotic BMD. Multivariate analyses showed the combination of all 4 variables was marginally better than OSTi in the derivation cohort (femoral neck AUC: 0.879 vs. 0.852) and validation cohort (0.860 vs. 0.841). Results of deep learning produced similar results (AUC: 0.855). Total hip BMD results were also similar for univariate, multivariate and machine learning analyses using the derivation and validation cohorts: OSTi: 0.861 vs. DXA-MAP: 0.869; OSTi: 0.854 vs. DXA-MAP: 0.866.
Conclusion: The DXA MAP Project represents a novel approach to identify Irish adults most likely to benefit from a screening DXA test for osteoporosis. These results can support a national programme to optimise DXA resources, and requires further validation among other populations.

P420
ACCURACY OF CENTRAL DXA DIAGNOSIS OF OSTEOPOROSIS: THE DXA HIP PROJECT

E. E.[1], J. Carey[2], L. Yang[3], T. Wang[4], C. Silke[2], M. O'Sullivan[5], A. Brennan[6], M. Dempsey[7], M. Ebrahimiarjestan[8], M. Yu[8], B. Whelan[2]

[1]School of Management, Guangxi Minzu Univ., Nanning, China, [2]School of Medicine, College of Medicine, Nursing and Health Sciences, Univ. of Galway, Galway, Ireland, [3]Insight SFI Research Centre for Data Analytics, Data Science Institute, Univ. of Galway, Galway, Ireland, [4]Nuffield Dept. of Medicine, Univ. of Oxford, Oxford, UK, [5]Univ. of Galway, Galway, Ireland, [6]School of Computer Science, College of Science and Engineering, Univ. of Galway, Galway, Ireland, [7]School of Engineering, College of Science and Engineering, Univ. of Galway, Galway, Ireland, [8]Dept. of Industrial Engineering, Tsinghua Univ., Beijing, China

Objective: 30 years ago the WHO published criteria for the diagnosis of postmenopausal osteoporosis. Multiple studies show the majority of fractures however occur among whose T-score is > -2.5, a phenomenon referred to as an epidemiologic paradox. Current collaborative publications of an International working group representing 9 international bone societies show opinion remains divided as to what constitutes an 'osteoporotic' fracture. We used the DXA HIP Cohort in Ireland to evaluate the sensitivity, specificity and accuracy of DXA for diagnosing osteoporosis using a major osteoporotic fracture as the gold standard.
Methods: We merged, cleaned and anonymised data from 4 DXA centres in the West of Ireland with hospital admission diagnoses and administrative as previously described. We examined the performance of central DXA testing to correctly diagnose osteoporosis using major osteoporotic fracture (MOF) as the disease. Multiple

subgroup analyses were also performed by gender, age, fracture site, and site of BMD measurement to capture the range of performance. We calculated sensitivity, specificity and accuracy using confusion matrices, and AUC.

Results: Data were available for 30,158 adults $\geq$ 40 y including 30% with a prior fracture and 19% with a MOF. Overall 25% had a white female T-score ≤ -2.5 including 22% without MOF and 38% with MOF. There was a considerable range in the sensitivity, specificity, and accuracy of DXA for diagnosing osteoporosis, summarised in the Table below depending on the site of fracture and BMD measurement, age, and gender of the population.

Table. Sensitivity, specificity and accuracy of lowest site BMD to Diagnose Osteoporosis.

Characteristic	Sensitivity	Specificity	Accuracy
Mean% (Range) for Men	35.2 (23.1 – 60.0)	81.7 (57.9 – 87.1)	73.1 (58.6 – 76.2)
Mean% (Range) for Women	38.2 (14.3 – 78.0)	77.5 (38.0 – 94.4)	69.8 (52.8 – 85.2)
Mean% (Range) Overall	37.8 (15.6 – 76.1)	78.0 (43.6 – 93.5)	70.2 (55 – 84.1)

*AUC values ranged from 0.517-0.771

Conclusion: Although central DXA measurement is recommended to make a diagnosis of osteoporosis in older men and postmenopausal women, the considerable variation in sensitivity, specificity and accuracy of such testing must also be taken into account.

Acknowledgement: This project was funded by the Health Research Board of Ireland: S.D.A.P.-2020-0001.

P421
COMPARATIVE CHARACTERISTICS OF LYSED LYMPHOCYTES XANTHINE OXIDOREDUCTASE PROFILES IN DISCOID AND SYSTEMIC LUPUS ERYTHEMATOSUS

E. E. Mozgovaya[1], S. A. Bedina[1], A. S. Trofimenko[1], S. S. Spitsina[1], M. A. Mamus[1], I. A. Zborovskaya[1]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, Russia

Objective: Discoid lupus erythematosus (DLE) and systemic lupus erythematosus (SLE) are chronic inflammatory diseases of the connective tissue. Typical discoid elements may occur in 25% of patients with SLE. In some cases, DLE can be an independent nosology. Wherein, unlike SLE, signs of internal organs damage are not detected and antinuclear antibodies are not determined in most cases. Oxidative stress are involved in pathogenesis of DLE and SLE. Development of oxidative stress is closely associated with the activation of xanthine oxidoreductase (XOR) enzyme system. We aimed to reveal the features of XOR activities profiles in lysed lymphocytes of DLE and SLE patients.

Methods: 31 patients with DLE, 56 patients with SLE, 35 apparently healthy individuals were enrolled in study. The activities of two forms of XOR (xanthine dehydrogenase (XDG; EC 1.17.1.4) and xanthine oxidase (XO; EC 1.17.3.2)) were measured in lysed lymphocytes.

Results: Compared to the control, activities of both XOR forms were decreased in lysed lymphocytes of DLE and SLE patients. Wherein XO and XDG activities were higher in DLE in contrast to subgroups of patients with low, moderate and high SLE activities. A pronounced decrease of XO activity was accompanied by a slight decrease of XDG activity in DLE, which may indicate the predominance of hypoxanthine and xanthine utilization by dehydrogenation. This direction has a positive meaning because it is accompanied by a reduction in the intracellular production of reactive oxygen species. In contrast to DLE, SLE was characterized by an increase in the ratio of XO/XDG activities with an increase in the degree of immune inflammation activity. Together with other factors, reactive oxygen species formed as a result of the catalytic activity of XO can have a damaging effect on cellular structures, participating in the development of associated with SLE activity lymphopenia.

Conclusion: Changes in XOR activities in lysed lymphocytes in DLE and SLE were unidirectional, but were more pronounced in the systemic form of the disease. Thus, DLE and SLE are characterized by some common changes in XOR activities. At the same time, lysed lymphocytes XOR profiles have distinctive features, which are characteristic for nosology.

P422
A DIFFERENTIATED APPROACH TO THE THERAPY OF CHRONIC PAIN IN OSTEOARTHRITIS CONSIDERING THE PHENOMENON OF CENTRAL SENSITIZATION

E. Filatova[1], E. Polishchuk[1], E. Taskina[1], L. Alekseeva[1], N. Kashevarova[1], A. Karateev[1], A. Lila[1]

[1]VA Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Central sensitization (CS) and emotional-affective accretions play an important role in the formation of chronic pain syndrome in osteoarthritis (OA). We aimed to determine the therapeutic potential of different variants, analgesic therapy in patients with OA with signs of CS.

Methods: 90 patients with osteoarthritis of the knee and/or hip joints with chronic pain syndrome were included in the study. The somatosensory nervous system state, pain syndrome severity according to VAS, WOMAC index, pain neuropathic component severity according to DN4 questionnaire, CSI scale, anxiety and depression level according to HADS scale were evaluated before the study, as well as on study day 14 and 28. After screening, all patients were divided into three groups: Group 1 patients with chronic pain and signs of CS, without signs of organic lesions of the nervous system, depression and anxiety; Group 2 patients with chronic pain and signs of CS and signs of depression and anxiety without signs of organic lesions of the nervous system; Group 3 patients with OA with chronic pain and signs of somatosensory lesions. Each group of patients received differentiated therapy: Group 1—etoricoxib 60 mg/d + gabapentin 900 mg/d (300 mg 3 times a day); Group 2—etoricoxib 60 mg/d + duloxetine 60 mg/day; Group 3—etoricoxib 60 mg/d + gabapentin 900 mg/d + Motaren gel 2 times a day for local pain area.

Results: The clinical characteristics of the patients included in the study are presented in Table 1. Significant differences between the groups at the time of inclusion in the study were in the following indicators: duration of the disease, DN4 and CSI scores, anxiety/depression level. These differences were explained by the criteria for grouping patients. Against the background of three therapy schemes, considering pathogenetic aspects of the pain syndrome, positive dynamics was observed in all studied parameters in all groups.

Table 1. Clinical characteristics of patients.

	Group 1 (n=30)	Group 2 (n=30)	Group 3 (n=30)
Age (y)	50,0 [43,0;55,0]	51,0 [46,0;60,0]	69,5 [65,0;79,0]
Duration of OA (y)	3,5 [1,0;6,0]	6,0 [5,0;7,0]	12,0 [5,0;26,0]
VAS, score	6,0 [5,0;7,0]	5,0 [5,7;7,0]	7,0 [6,0;8,0]
DN4	4,0 [3,0;4,0]	5,0 [4,0;6,0]	4,5 [4,0;6,0]
CSI	44,0 [41,0;46,0]	48,0 [46,0;52,0]	39,0 [36,0;43,0]
HADS-A	5,0 [4,0;7,0]	11,0 [10,0;13,0]	7,0 [6,0;8,0]
HADS-D	1,0 [0;2,0]	8,0 [7,0;8,0]	3,0 [1,0;5,0]
WOMAC	1465,0 [1093,0;740,0]	1059,0 [940,0;1150,0]	1215,5 [1033,0;1395]
WOMAC (pain)	282,5 [243,0;333,0]	248,0 [174,0;310,0]	227,0 [212,0;291,0]
WOMAC (stiffness)	94,0 [59,0;160,0]	100,0 [76,0;110,0]	92,0 [81,0;112,0]
WOMAC (function)	1042,5 [779,0;1208,0]	708,0 [666,0;1130,0]	862,0 [731,0;985,0]

Table 2. Clinical indicators after therapy

	Group 1 (n=30)	Group 2 (n=30)	Group 3 (n=30)
VAS, score	4,0[3,0;4,0]	3,0[3,0;4,0]	3,5[2,0;4,0]
DN4	3,0[2,0;3,0]	3,0[3,0;4,0]	3,0[2,0;3,0]
CSI	37,5[36,0;41,0]	43,5[40,0;44,0]	37,0[36,0;40,0]
HADS-A	4,0[4,0;5,0]	7,0[7,0;7,0]	5,0[5,0;7,0]
HADS-D	1,0[1,0;3,0]	5,0[4,0;6,0]	4,0;2,0;6,0]
WOMAC	1079,0[818,0;1370,0]	885,0[470,01282,0]	804,5[701,0;1050,0]
WOMAC (pain)	210,5[130,0;280,0]	125,0[83,0;260,0]	151,5[144,0;215,0]
WOMAC (stiffness)	80,0[43,0;116,0]	64,0[43,0;97,0]	71,0[55,0;81,0]
WOMAC (function)	746,5[582,0;985,0]	696,0[320,0;876,0]	567,0[502,0;757,0]

Conclusion: This study demonstrates the need to develop an algorithm for a differentiated approach to the therapy of chronic pain in OA, considering the phenomenon of CS.

P423
EVALUATION OF THE EFFECT OF TOFACITINIB AND ADALIMUMAB ON CLINICAL MANIFESTATIONS AND ACTIVATION OF THE CENTRAL NERVOUS SYSTEM ACCORDING TO THE FUNCTIONAL MAGNETIC RESONANCE IMAGING IN PATIENTS WITH RHEUMATOID ARTHRITIS

E. Filatova[1], A. Karateev[1], A. Potapova[1], S. Morozova[2], E. Polishchuk[1], E. Luchikhina[3], V. Amirdzhanova[1], E. Zotkin[1], A. Lila[1]

[1]VA Nasonova Research Institute of Rheumatology, [2]Scientific Center of Neurology, [3]Regional Scientific Research Clinical Institute n.a. M.F. Vladimirsky, Moscow, Russia

Objective: Central sensitization (CS) is a phenomenon associated with nociplastic changes, characterized by a significant decrease in the pain threshold and hyperalgesia. CS often develops on the background of autoimmune inflammation and plays an important role in the development of chronic pain in systemic rheumatic diseases such as rheumatoid arthritis (RA). We aimed to evaluate the dynamics of chronic pain and neuroplastic changes in the central nervous system in patients with RA during therapy with the JAK inhibitor tofacitinib and the TNFα inhibitor adalimumab, depending on the presence or absence of signs of CS.

Methods: the study group consisted of 40 patients with RA, 87.5% women, age 46.6 ± 11.4 y, with moderate/high disease activity (DAS28-CRP ≥ 3.2) while taking methotrexate and severe chronic pain (≥ 50 mm on visual analogue scale, VAS), of which 20 patients had signs of CS (CSI ≥ 40, CS+), 20—had no signs of CS (CSI < 40, CS−). 20 patients (10 with CS+ and 10 with CS−) were prescribed tofacitinib (TOFA) per os 5 mg BID and 20 patients were prescribed adalimumab 40 mg subcutaneously once every 2 weeks. All patients underwent functional MRI of the brain (b-f-MRI) on the background of a nociceptive stimulus (hand squeezing a rubber ball) before and after 4 weeks of therapy.

Result: TOFA and ADA therapy provided a statistically significant reduction in RA activity (DAS28-CRP, CDAI, SDAI), as well as pain, fatigue (FACIT), depression (HADS) in the TOFA group and anxiety (HADS) in the ADA group, as well as count PainDETECT and CSI. There was a trend towards a higher analgesic effect of TOFA (according to BPI scales). There were no significant differences in the dynamics of RA activity and symptoms in patients with CS + and CS−. According to f-MRI data, during treatment with TOFA in patients with RA CS-, no significant differences in the activation of CNS structures were identified; in patients with RA CS + , significant changes in the activation of the brain cortex were revealed. During ADA therapy, significant differences were observed in the activation of the cerebral cortex in both patients with RA CS− and patients with RA CS + .

Conclusion: TOFA and ADA have a similar effect on the activity of RA and the severity of the main symptoms of this disease, regardless of the presence of CS. There are differences in the activation of the brain cortex when using TOFA in RA patients with and without CS.

P424
RESULTS OF SCREENING FOR HIGH RISK OF FRACTURES USING THE FRAX CALCULATOR

E. Gladkova[1], O. Lesnyak[1]

[1]Northwestern Mechnikov State Medical Univ., St. Petersburg, Russia

Objective: Screening for high fracture risk using the FRAX calculator has been shown to be effective in preventing fractures in older women (Merlijn et al., 2020). However, the effectiveness of screening in men and women of younger age has not been studied. The purpose of this study was to evaluate the effectiveness of screening for high fracture risk in men and women aged 40 years and older in primary health care facility.

Methods: The study was performed in the city polyclinic in St. Petersburg in 2017–2021. A high fracture risk was assessed in those who have sought medical care during this time and was determined if a subject suffered an osteoporotic fracture or if his/her 10-year probability of a major osteoporotic fracture according to FRAX calculation exceeded the therapeutic intervention threshold developed for Russia. Those with high fracture risk were recommended osteoporosis treatment. The fracture incidence was compared in high and low fracture risk groups in 2016 (before screening) and in 2022 taking into account mortality rate.

Results: 11,013 subjects were screened which amounted to 31.7% of the total population served. The high fracture risk was determined in 8.1% of men and 20.9% women. Of these, 99.6% of men and 84.8% of women were classified as high-risk based on fragility fractures alone. The fracture incidence in this group reduced from 570.1 per 10,000 in 2016 to 277.3 per 10,000 in 2022 ($p = 0.00001$). At the same time in low fracture risk group the fracture incidence increased from 126.4 per 10,000 in 2016 to 178.9 per 10,000 in 2022 ($p = 0.0048$). The difference was statistically significant when comparing the two groups ($p = 0.0068$). Men and women showed the same tendency for decreasing the frequency of fractures in the high risk group and increasing in the low risk group. In women at high risk of fractures, the incidence of fractures decreased from 576.9 in 2016 to 296.6 per 10,000 in 2022 ($p = 0.0001$), in men—from 524.2 to 138.9 ($p = 0.023$) for the same period of time.

Conclusion: The screening for high fracture risk in men and women of 40 years and older is effective in reducing fracture incidence.

P425
INCIDENCE OF IMMINENT SUBSEQUENT FRACTURE IN POSTMENOPAUSAL WOMEN AS CAPTURED IN PRIMARY CARE COMPARED TO HOSPITAL RECORDS IN UK AND SPAIN

X. Chen[1], T. Rashod-Mistry[1], G. Fabiano[1], A. Delmestri[1], A. Moayyeri[2], J. Warden[2], C. Reyes[3], R. Pinedo-Villanueva[1], E. H. Tan[1]

[1]Nuffield Dept. of Orthopaedics, Rheumatology, and Musculoskeletal Sciences, Univ. of Oxford, Oxford, UK, [2]UCB Pharma, Slough, UK, [3]Fundació Institut Universitari per a la recerca a l'Atenció Primària de Salut Jordi Gol i Gurina (IDIAPJGol), Barcelona, Spain

Objective: To compare the incidence of imminent subsequent fracture among postmenopausal women with fragility fractures as recorded in primary care vs. hospital setting.

Methods: We included women aged ≥ 50 y with fragility fracture of any site using SNOMED codes recorded in primary care databases from 1 April 2010 to 31 March 2018: Clinical Practice Research Datalink (CPRD Aurum, UK) and Sistema d'Informació per al Desenvolupament de la Investigació en Atenció Primària (SIDIAP, Spain), linked with hospital databases: Hospital Episode Statistics (HES) and Conjunt asic asic de dades (CMBD), respectively. We estimated the overall incidence rate (IR) of subsequent fracture in the two years after index fracture, as well as site-specific cumulative incidence, accounting for competing risk of death.
Results: A total of 48,108 and 143,992 women had index fractures recorded in CPRD and SIDIAP respectively, whereas 31,362 and 45,981 women had index fractures recorded in HES and CMBD, respectively. The overall IR (per 1,000 person years) of subsequent fracture was 1.6 times higher in primary care as compared to hospital setting in the UK (114 [95% CI 112–116] vs. 70 [67–72]), and 4.5 times higher in Spain (142 [95% CI 141–143] vs. 31 [30–32]). The number of fragility fractures recorded in both settings were more similar for hip fractures, but higher for vertebral and non-hip non-vertebral (NHNV) in primary care. As the hospital records in both countries did not include emergency room visits, most of non-hip fractures which do not need to be hospitalised are captured in primary care. The proportion of index fractures recorded in the hospital being hip fractures was higher in Spain than in the UK. The differences between the cumulative incidence of subsequent hip fractures according to fracture sites across database settings is presented in Table 1.

Table 1. Two-year cumulative incidence of imminent subsequent fracture in women aged 50 and above with an index fracture in primary care and hospital databases

		Cumulative incidence (95%CI)			
		Primary Care		Hospital	
Index fracture site	Subsequent fracture site	CPRD (UK)	SIDIAP (Spain)	HES (UK)	CMBD (Spain)
Hip	Hip	12% (11%, 13%)	24% (24%, 25%)	4.4% (4.0%, 4.8%)	3.1% (2.8%, 3.3%)
		Cumulative incidence (95%CI)			
		Primary Care		Hospital	
Index fracture site	Subsequent fracture site	CPRD (UK)	SIDIAP (Spain)	HES (UK)	CMBD (Spain)
	NHNV	7.5% (6.9%, 8.1%)	4.2% (4.0%, 4.5%)	5.5% (5.0%, 5.9%)	1.8% (1.6%, 2.0%)
	Vertebra	0.74% (0.56%, 0.97%)	0.60% (0.51%, 0.70%)	0.49% (0.37%, 0.65%)	0.31% (0.24%, 0.39%)
Vertebra	Hip	2.5% (2.0%, 3.1%)	1.4% (1.2%, 1.7%)	4.4% (3.4%, 5.6%)	2.3% (1.9%, 2.9%)
	NHNV	6.8% (6.0%, 7.7%)	5.1% (4.7%, 5.6%)	7.6% (6.3%, 9.1%)	2.0% (1.6%, 2.6%)
	Vertebra	18% (17%, 19%)	11% (10%, 11%)	2.8% (2.0%, 3.7%)	1.5% (1.2%, 2.0%)
NHNV	Hip	1.6% (1.5%, 1.7%)	1.4% (1.4%, 1.5%)	3.9% (3.7%, 4.2%)	2.2% (2.0%, 2.4%)
	NHNV	15% (15%, 16%)	19% (19%, 20%)	7.0% (6.6%, 7.4%)	2.9% (2.7%, 3.2%)
	Vertebra	0.75% (0.66%, 0.84%)	0.73% (0.68%, 0.79%)	0.71% (0.59%, 0.84%)	0.44% (0.36%, 0.53%)

Conclusion: Differences are likely due to a mix of the nature of fracture recording in each country/setting and possible re-recording of vertebral and NHNV fractures in primary care. Understanding these differences will help future research in generating reliable real-world evidence for osteoporosis using these databases.
Acknowledgments: This project was funded by UCB Pharma and Amgen Inc.

P426
EARLY-ONSET OSTEOPOROSIS IN A PATIENT DUE TO NOVEL MUTATION OF THE WNT1 GENE

E. Karaseva[1], A. Eremkina[1], R. Salimkhanov[1], A. Myakota[1], E. Sevostyanenko[1], N. Mokrysheva[1]

[1]Endocrinology Research Centre, Moscow, Russia

The WNT signaling pathway is recognized as an essential regulator of the bone remodeling process. Homozygous mutations in *WNT1* gene can lead to a rare inherited disorder known as osteogenesis imperfecta type XV and heterozygous mutations have been found in adults with early-onset osteoporosis (EOOP). We report a patient with EOOP and spinal fractures during her second pregnancy.
Casereport: A 32 year-old woman noted the severe back pain since the third trimester of her twin pregnancy, restricting movement. Post-delivery CT-scan revealed wedge-shaped collapse of multiple thoracic vertebrae: $Th_{4\text{-}5,7\text{–}9,11}$, but she continued breastfeeding. No risk factors, previously fractures or family history of osteoporosis were reported. Her first pregnancy was uneventful. DXA confirmed reduction BMD in the lumbar spine (Z-score − 3.5) and femoral neck (Z-score − 2.4). Blood tests excluded secondary causes of bone fragility, but showed elevated bone turnover markers (Ctx– 1.88 ng/mL (< 0.573), osteocalcin—52 ng/mL (< 43), ALP—112 U/l (42–98)). Vitamin D metabolites analysis showed only 25(OH)D deficiency—17 ng/ml. Genetic test identified a novel heterozygous missense mutation (chr12:48979468G > A, c.105G > A) in the *WNT1* gene, classified as a variant of uncertain significance. The patient received daily treatment with cholecalciferol 7000 IU for the initial 2 months, followed by 2000 IU, alfacalcidol 1 mcg, and Ca carbonate 1500 mg. Lactation was medically discontinued. In the 6-month follow-up, there was no evidence of new fractures. BMD increased at the lumbar spine (+ 25.7%) and femoral neck (+ 13.2%). Bone turnover markers normalized, and calcium-phosphate metabolism markers were within the normal range.
Conclusion: This case highlights a novel *WNT1* gene mutation causing EOOP. It emphasizes the importance of complex clinical, biochemical, radiologic and even genetic evaluation to identify the true cause of osteoporosis in young patients with multiple low-trauma fractures.

P427
ROLE OF ULTRASOUND EXAMINATION OF THE THIGH MUSCLE AND BIOIMPEDANCE ANALYSIS IN THE DIAGNOSIS OF SECONDARY SARCOPENIA IN PATIENTS WITH RHEUMATOID ARTHRITIS

E. Keledzhyyeva[1], E. Kulieva[1], V. Kaliberdenko[1], S. Khamidova[2]

[1]V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Tashkent State Pedagogic Univ. named after Nizami, Tashkent, Uzbekistan

Objective: Sarcopenia is an older-onset, progressive and generalized skeletal muscle disorder associated with an increased likelihood of adverse outcomes, including falls, fractures, and mortality. Sarcopenia at the present time is recognized as one of the five major risk factors for morbidity and mortality in people over 65 years old.
Methods: Diagnostic methods recommended by EWGSOP2 were used: SARC-F questionnaire, creatinine dilution test, ultrasound diagnostics (ultrasound) of the quadriceps femoral muscle (to determine the thickness and cross-sectional area of this muscle), determination of skeletal muscles mass using of DXA, determined the cross-sectional area of the psoas muscle using computed tomography, bioimpedance measurement, dynamometry, physical performance tests.

Results: The study involved 84 patients with rheumatoid arthritis; the control group consisted of 18 healthy people. The patients were divided into 4 groups. For each group, basic diagnostic methods were carried out, such as the SARC-F questionnaire, physical activity tests, dynamometry and one additional method: group A (22 patients)—basic diagnostic methods and DXA, group B (22 patients)—basic methods and bioimpedance measurement, group C (20 patients)—basic methods and CT-Scan of the cross-sectional area of the psoas muscle, group D (20 patients)—basic methods and ultrasound examination of the quadriceps femoral muscle (thickness and cross-sectional area).
Conclusion: Secondary sarcopenia was diagnosed in 81% of the examined patients. The most accessible and sensitive diagnostic methods at the DXA level can be considered bioimpedance measurement and ultrasound examination. CT-Scan also showed the feasibility of recommending the introduction of screening for sarcopenia, but due to its higher cost, it can be classified as an auxiliary diagnostic method.

P428
EVALUATION OF SONOGRAPHY EFFICIENCY IN THE DIAGNOSIS OF SUBACROMIAL PAIN SYNDROME

E. Keledzhyyeva[1], Y. Popenko[1], Y. Usachenko[1], N. Shadchneva[1], A. Useinova[1], E. Kulieva[1], V. Kaliberdenko[1], V. Yas[2]

[1]V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Ege Univ., Izmir, Turkey

Objective: Subacromial pain syndrome (SAPS) is defined as all nontraumatic, usually unilateral, shoulder problems that cause pain, localized around the acromion, often worsening during or subsequent to lifting of the arm. The purpose of the study is to determine the possibilities of using sonography in the diagnosis of compression of the suprascapular nerve in the development of the subacromial pain syndrome.
Methods: From 2020–2023, 47 patients aged 26–45 y were examined. Clinical examination of these patients revealed the presence of wasting of the muscles of the scapular region, in particular the supraspinatus and infraspinatus muscles in 12 people, wasting of the infraspinatus muscle in 39 people. All patients underwent ultrasound examination with a linear sensor with a frequency of 5–12 MHz. The results of the ultrasound examination were verified using MRI.
Results: In all patients, ultrasound examination revealed unilateral muscle wasting of the supraspinatus and infraspinatus regions in the form of a decrease in the thickness of the muscle component with a simultaneous moderate increase in the echogenicity of muscle tissue; the differences in the thickness of the muscle layer on the healthy and injured side were significant ($P < 0.05$). In 36 patients, a volumetric anechoic formation with a smooth, clear contour, round shape, size from 11–32 mm, localized in the projection of the location of the proximal (22 patients) and distal (6 patients) sections of the suprascapular nerve was detected.
Conclusion: An assessment of the condition of the suprascapular nerve, due to its small size and the complexity of visualization, may not be based on data on changes in its size, but on the presence of indirect qualitative and quantitative signs, such as a displacement of the position of the suprascapular nerve relative to the healthy side, the presence of space-occupying formations in the projection of the supraspinatus and infraspinatus fossa, the presence of a conglomerate of heterogeneous tissue in the thickness of the infraspinatus muscle above the projection site of the suprascapular nerve and hypotrophy of the supraspinatus and infraspinatus muscles. Thus, the reliability of the complex of ultrasound signs was 72%, specificity 96%.

P429
CHANGES OF BONE MINERAL DENSITY IN PATIENTS WITH PRIMARY COXARTHROSIS DEPENDING ON BMI

F. Ilchenko[1], S. Hryvenko[1], E. Kulieva[1], V. Kaliberdenko[1], E. Keledzhyyeva[1], N. Shadchneva[1], A. Useinova[1], L. Ametova[1]

[1]V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: Due to the facts, the overweight and obesity are among the main risk factors for osteoarthritis of different localization. In addition, the BMI is an important determinant that effects of BMD of the skeleton.
Methods: The analysis of BMD and calculation of BMI were performed in 248 patients with primary coxarthrosis, aged 45–87 y (of which 161 women—64.9%, 87 men—35.1%). Patients were calculated BMI according to the standard formula and DXA of the lumbar spine and proximal femur with a T-criterion assessment. Thus, the patients were divided into 3 groups: normal weight (18.5–24.9), overweight (25–29.9) and obesity (30–50.7).
Results: Among the patients of the studied groups, the frequency of reduced BMD was 84.6%—210 people (osteoporosis 44.2%—93 people, osteopenia 55.8%—117 people). There are no significant rank differences in BMD and BMI in all three groups ($p = 0.36$). The assessment of BMD in the lumbar spine is characterized by the absence of significant differences between all three groups ($p = 0.42$). There were also no significant differences in the values of BMD of the proximal femur depending on BMI ($p = 0.96$).
Conclusion: There is no direct correlation between BMD and BMI in patients with primary coxarthrosis.

P430
EVALUATION OF THE EFFECTIVENESS OF THE USE OF PLATELET-RICH PLASMA IN THE TREATMENT OF ELBOW JOINT ENTHESOPATHIES

S. Hryvenko[1], F. Ilchenko[1], E. Kulieva[1], E. Keledzhyyeva[1], N. Shadchneva[1], V. Kaliberdenko[1], E. Mureyko[2], E. Kondratiuk[1]

[1]V.I. Vernadsky Crimean Federal Univ., Simferopol, [2]N.N. Petrov National Medicine Research Center of Oncology, St. Petersburg, Russia

Objective: Epicondylitis of the shoulder is a common condition that affects up to 3% of the adult population. Being the most common cause of pain in the elbow joint, the disease mostly occurs in people of working age from 35–54 y.
Methods: From 2017–2023 we observed 100 patients of both sexes aged from 31–65 y, with clinical symptoms of internal and external epicondylitis without impairment of hand grip strength. The diagnosis of epicondylitis was made based on history and clinical examination. All subjects tested had at least one positive test (Mill's test, Cozen's test, Maudsley test, Golfer, Elbow test). Results were recorded using the Patent-Rated Tennis Elbow Evaluation (PRTEE) psychometric scale at 1, 6 and 12 months after the 2nd injection. The comparison group consisted of 50 patients who received betamethasone injections 2 times with an interval of 14 days. The main group included 50 patients who received 2 PRP injections with an interval of 14 d.
Results: During treatment, as well as follow-up, we did not notice any negative side effects after the administration of platelet-rich plasma (PRP) and betamethasone. With the administration of betamethasone, a decrease in pain and improvement in limb function was noted on days 1–2 after the first administration, whereas with the introduction of PRP, on days 3–6. The most pronounced clinical effect 12 months after treatment was found in patients who received PRP injections. Moreover, the result was maintained throughout the entire observation period in 43 (86.0%) patients. We found that the effect after using

PRP increased by 6 months with a slight tendency to decrease the effect by 12 months. It should be noted that 7 (14.0%) respondents in this group noted the absence of an effect at all periods of observation. Patients who received Betamethasone showed the lowest level of pain after 1 month, with a gradual trend towards a decrease in clinical effect after 6 months and an increase in clinical symptoms of the disease by 12 months after treatment. 5 (10.0%) patients noted a lack of effect after twofold use of betamethasone at all periods of observation. However, the results obtained in this group, 12 months after treatment, were still better than the initial data. It should be noted that early treatment results (1–2 months) were better with the administration of betamethasone, with a subsequent decrease in effectiveness. With the introduction of PRP, long-term (6–12 months) treatment results were better.

Conclusion: Our studies have shown high, up to 86.0%, effectiveness of our method for treating internal and external epicondylitis of the shoulder using PRP in comparison with glucocorticosteroids. The data obtained only confirm the need for further study of the effect of this promising cellular technology on tissues.

P431
THE ROLE OF C-TYPE NATRIURETIC PEPTIDE ON BONE METABOLISM

E. Kondo[1]

[1]Kondo Orthopaedic Clinic, Ikoma City, Japan

Objective: Recent studies have revealed that C-type natriuretic peptide (CNP) is a potent stimulator of endochondral bone growth. Nevertheless, the effect of CNP on bone turnover has not yet been well studied.

Methods: I investigated the bone phenotype of a mouse model with elevated plasma CNP concentrations (*CNP-Tg* mice). Furthermore, I performed an open and stabilized femoral fracture using 8-week-old *CNP-Tg* mice and compared the healing process with age-matched wildtype mice.

Results: μCT analysis revealed less bone in femurs, but not in lumber vertebrae, of young adult *CNP-Tg* mice than that of wildtype mice. Bone histomorphometry of the tibiae from 8-week-old *CNP-Tg* mice showed enhanced osteoblastic and osteoclastic activities, in accordance with elevated serum levels of osteocalcin and TRAP5b, respectively. In the healing process of mouse femoral fracture, CNP and its receptors, natriuretic peptide receptor-B (NPR-B) and natriuretic peptide clearance receptor are immunohistochemically expressed in hard calluses of wildtype mice, suggesting possible role of CNP/NPR-B signaling in fracture repair, especially in bone remodeling stage. On μCT analysis, rapid decrease in callus volume was observed in *CNP-Tg* mice followed by generation of significantly higher new bone volume with a tendency of increased bone strength. In addition, μCT analysis also showed that bone remodeling was accelerated in *CNP-Tg* mice, which was also evident from increased serum osteocalcin and TRAP5b levels in *CNP-Tg* mice at remodeling stage of fracture repair.

Conclusion: CNP activates bone turnover and remodeling in vivo and possibly accelerates fracture healing in mouse model.

P432
ACETABULAR BONE STOCK MSCT-ASSISTED QUANTIFICATION DURING DDH: APPLICATIONS TO THR

E. Kovbasa[1], A. Oliynik[2], D. Sinegubov[2], A. Altanets[3], K. Furmanova[4], A. Naumenko[4]

[1]Kharkiv Institute of Medicine and Biomedical Sciences, [2]Dnipro State Medical Univ., [3]KNE "Dnipro Clinical Municipal Hospital No. 4", [4]N1 Clinic, Dnipro, Ukraine

Objective: There was conducted preoperative assessment of acetabular medial wall bone stock in projection of the planned surgical implant bony bed accordingly to the developed MSCT-measuring technique to prevent THR complications.

Methods: There were revealed complex comparative MSCT-morphometric investigation of 32 normal hips and 65 hips with DDH as medial wall bone thickness assessment in projection of lig. teres bed and planned acetabular component's bony bed centre accordingly to the proposed MSCT-measuring technique; their correlation with femoral head's cranial migration, acetabular horizontal sphericity angle and centre-edge angle. Mann–Whitney test, Spearman's rank correlation coefficient were applied. Data presented as Me (95% CI), p value < 0.05.

Results: Acetabular medial wall thickness in the projection of lig. teres/acetabular component's bony bed centre was defined as: 4.3 mm (3.3; 4.8)/7.2 mm (6.2; 7.8) for normal hips, 9.95 mm (7.5; 11.6)/11.85 mm (9.8; 13.5) for Crowe I hips, 15 mm (1.7; 17.3)/15.7 mm (13.5; 17.3) for Crowe II hips and 15.45 mm (13.7; 19.8)/16.05 mm (12.8; 20.2) for Crowe III hips, respectively. Correlation of medial wall thickness in projection of acetabular component's bony bed centre with femoral head's cranial migration, horizontal sphericity acetabular angle and centre-edge angle was defined as: $r = 0.36$ ($p = 0.006$); $r = 0.36$ ($p = 0.007$); $r = -0.47$ ($p = 0.0007$), respectively. Weak correlation of acetabular medial wall bone stock in projection of acetabular component's bony bed centre with femoral head's cranial migration indicates the invalidity of the Crowe's DDH staging for THR's needs and the necessity of independent measuring of the index during individual preoperative planning.

Conclusion: Since conventional biplanar X-ray imaging is invalid for precise measuring of the aforementioned indices due to superimpositioning, the proposed MSCT-morphometric technique could be of help for individual safe implantation technique selection during THR preplanning for DDH.

P433
PREOPERATIVE MSCT QUALITATIVE ASSESSMENT OF ACETABULAR SPONGIOUS BONE FOR DDH

E. Kovbasa[1], A. Altanets[2], O. Loskutov[3], A. Alieksieiev[4], O. Goregliad[5]

[1]Kharkiv Institute of Medicine and Biomedical Sciences, Dnipro, [2]KNE "Dnipro Clinical Municipal Hospital №4", Dnipro, [3]MedinUA Clinic & Lab, Dnipro, [4]Univ. Clinic of National Medical Univ., Kiev, [5]KNE "Dnipro Clinical Municipal Hospital №16", Dnipro, Ukraine

Objective: There was conducted complex comparative MSCT-morphometric assessment of acetabular spongious bone X-ray density during DDH accordingly to the developed technique.

Methods: 32 normal hips and 65 hips with DDH were assessed via determining spongious bone tissue X-ray density (HU) accordingly to the developed method after preliminary DXA of the lumbar spine with the following excluding of patients with the signs of osteoporosis at the pre-analytical stage. The scanning procedure was performed using a calibration phantom Mindways VR QCT PRO (Mindways Software Inc., Austin, TX, USA). Mann–Whitney test, Spearman's rank correlation coefficient were applied. Data presented as Me (95% CI), p value < 0.05.
Results: There were defined physiological norm values of acetabular spongious bone X-ray density due as: 272 HU (238–306 HU) for supraacetabular area, 194 HU (172–216 HU) for anterior and 244 HU (220–268 HU) for posterior acetabular walls. All dysplastic hips showed increasing of X-ray density of supraacetabular area up to 334–428 HU depending the sectoral deficiency type. X-ray density loss is observed both for anterior/posterior acetabular walls in all sectoral deficiency subtypes. There were determined progressive increase of the X-ray density in supraacetabular area ($r = 0.89$, $p < 0.00001$) and steady decrease of anterior ($r = -0.85$, $p < 0.00001$) and posterior ($r = -0.75$, $p < 0.00001$) walls' ones are in correlation with the femoral head cranial displacement. The most severe loss of acetabular spongious bone X-ray density in all the zones was observed during the total sectoral deficiency subtype.
Conclusion: Proposed method of acetabular bone quality evaluation and conducted regularities should be taken into account for preoperative planning of acetabular component safe implantation during DDH.

P434
BONE MINERAL DENSITY IN CHILDREN WITH JUVENILE IDIOPATHIC ARTHRITIS

E. Kulieva[1], V. Kaliberdenko[1], V. Yas[2]

[1]V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Ege Univ., Izmir, Turkey

Objective: Juvenile idiopathic arthritis (JIA) is a chronic systemic connective tissue disease with an autoimmune mechanism of development that occurs in children under the age of 16. The JIA is characterized by involvement of vital organs in the process, formation of erosive-destructive polyarthritis, early disability of children and finally most significant manifestation of local and then generalized osteoporosis (OP). According to the WHO (2018) OP is a systemic skeletal disease characterized by a decrease of bone strength, which determines the high risk of fractures. OP in children with juvenile arthritis is initially local and then generalized, that the need to study the processes of bone remodeling with the identification of markers of its early diagnosis and correction.
Methods: The analysis of research scientific and literary materials of foreign authors working on the study about BMD in children with JIA.
Results: The decreasing of BMD in children with JIA is one of the significant problems of pediatrics, due to the high prevalence of this pathology, as well as the need for early detection of changes in BMD to prevent fractures. The cause of mineral changes in bone tissue is associated with the pathogenesis of JIA that activates in T- and B-cell immune reactions leading to hyperproduction of proinflammatory cytokines and destruction of bones, joints and other body tissues. The cytokines of JIA pathogenesis are divided into several groups, among which proinflammatory (IL-1, IL-6, IL-8, IL-17, TNFα, IFN-γ, chemokines) and anti-inflammatory cytokines (IL-4, IL-10, IL-13, growth factor). Hyperproduction of proinflammatory cytokines leads to damage to the synovial membrane of joints with subsequent destruction of cartilage and bones and, as a result, contributes to the development of generalized osteoporosis and erosive changes in joints.
Conclusion: The decreasing of BMD in children with JIA is close with the molecules of the immune system are involved in pathogenesis, like proinflammatory cytokines.

P435
EFFICACY OF DENOSUMAB IN CHINESE POSTMENOPAUSAL WOMEN: A RETROSPECTIVE COHORT STUDY

E. Lau[1], D. Lam[2]

[1]Hong Kong Center for Clinical Research, [2]Hong Kong Orthopaedic and Osteoporosis Center, Hong Kong, SAR China

Objective: To study the followings in Chinese postmenopausal women with osteoporosis, who were treated by denosumab for 3 year or more: BMD at the total hip and spine, total number of fractures, and adverse events from the treatment.
Methods: From 2011–2023, the records of osteoporosis postmenopausal women who received 6 monthly subcutaneous injection of denosumab was reviewed. Only women who received treatment for three years or more were included in this study. The following variables were used in the analysis: age, T-Score at baseline, annual BMD changes at the total hip and total spine, adverse events, number of fractures and site of fracture. Results were analyzed by SPSS.
Results: A total of 342 women were studied. The mean follow-up period was 6.1 y (SD = 2.9 years). All women had a T-Score of -2.0 or more at the total hip or spine at baseline. All were considered to have clinical indications for denosumab injection. The average annual increase in hip BMD was 1.5% (SD = 1.6%) and at the spine was 2.4% (SD = 2.9%). The following adverse events (AE) were considered as possibly related to denosumab. These included dizziness, slight dyspnea, tiredness and itchiness of skin. All AE were ranked as mild and none of these led to cessation of treatment. A total of 38 fractures occurred. The sites of fracture were: ribs (n = 8), forearm (n = 7), hip (n = 5), spine (n = 5), foot and ankle (n = 6), others (n = 7).
Conclusion: Denosumab was associated with a BMD increase that was in accordance with published clinical trials. It was considered a safe drugs in terms of adverse events.

P436
SERUM HEMOGLOBIN LEVEL, TYPE 2 DIABETES MELLITUS AND OSTEOPOROTIC RISK FRACTURE IN OLDER WOMEN

E. Lopez Gavilanez[1], M. Navarro Grijalva[1], N. Bautista Litardo[1], M. Hernandez Bonilla[1], M. Navarro Chavez[1], A. Segura Mestanza[1], R. Cedeño German[1]

[1]AECE Research Group, Association of Clinical Endocrinologists of Ecuador, Guayaquil, Ecuador

Objective: There is evidence of a continuous increase in fracture risk with decreasing hemoglobin levels, showing an almost linear association. This association has not been investigated in the Ecuadorian population. We aimed to evaluate whether there is an association between serum hemoglobin levels and the risk of osteoporotic fractures in Ecuadorian women with type 2 diabetes mellitus (T2DM) and without diabetes mellitus (DM).
Methods: We selected 386 women aged 60 years and older. We measured serum hemoglobin, ferritin, creatinine, vitamin B12 and vitamin D levels. We calculated the risk of major osteoporotic fracture (MOF) and hip fracture (HF) with the Ecuador-specific FRAX

model (version 4.1) and adjusted for rheumatoid arthritis (RA) in women with T2DM. We performed simple linear regression analysis (SLR) and multiple linear regression analysis (MLR) in both groups.
Results: In the whole sample n = 386 (with T2DM n = 190; without DM n = 196), mean age 70.7 ± 7.6 y. The baseline characteristics of each group are presented in Table 1. In the group with T2DM, the SLR model explains 2% and 4% of the variability in the risk of major osteoporotic fracture (p = 0.048; coeff b = – 0.321; SE = 0.161) and hip fracture (p = 0.005; coeff b = – 0.325; SE = 0.115), respectively. In the MLR model we found a significant association (p = 0.045; coeff b = – 0.136; SE = 0.068) between hemoglobin level and risk of hip fracture. In the group without DM, the SLR model explains 2% and 3% of the variability in the risk of major osteoporotic fracture (p = 0.047; coeff b = – 0.372; SE = 0.186) and hip fracture (p = 0.020; coeff b = – 0.3226; SE = 0.096), respectively. In the MLR model, we found no association between hemoglobin level and risk of major osteoporotic fracture or hip fracture.

Table 1. Baseline characteristics and results of the comparison of study groups.

Variables *	Without DM (n=196)	With T2DM (n=190)	*p* value	CI 95%
Age (yr)	70.8 ± 7.8	70.7 ± 7.4	0.897	-1.422; 1.622
Height (m)	1.5 ± 0.1	1.5 ± 0.1	1.000	-0.020; 0.020
Weight (Kg)	54.8 ± 12.8	61.4 ± 12.9	0.000	-9.172; -4.028
BMI (Kg/m^2)	25.8 ± 5.2	28.2 ± 5.5	0.000	-3.471; -1.329
Hemoglobin (mg/dL)	13.8 ± 1.4	13.2 ± 1.5	0.000	0.310; 0.890
Serum Creatinin (mg/dL)	0.7 ± 0.1	0.89 ± 0.88	0.003	-0.314; -0.066
Ferritin (ng/dL)	187.3 ± 190	211.7 ± 236.2	0.263	-67.235; 18.435
Vitamin B12 (pg/mL)	532.8 ± 265	601.5 ± 269.2	0.012	-122.162; -15.228
Vitamin D (ng/mL)	25.5 ± 28.9	25.5 ± 13.6	1.000	-4.543; 4.543
FRAX Score MOF	4.94 ± 3.55	4.09 ± 3.46 **	0.018	0.148; 1.552
FRAX Score HF	1.76 ± 1.83	1.98 ± 2.5 **	0.323	-0.657; 0.217

*mean ± SD; ** Adjusted Reumatoid Arthritis; MOF, Major osteoporotic fracture; HF, Hip fracture

Conclusion: In older Ecuadorian women with or without T2DM there is a moderate significant correlation between serum hemoglobin level and the risk of major osteoporotic fracture and hip fracture.

P437
CLINICAL OUTCOMES OF FRAIL ELDERLY PATIENTS AFTER DEPRESCRIPTION OF DENOSUMAB

E. M. Tam[1], C. C. M. Lau[1]

[1]Dept. of Medicine and Geriatrics, Tuen Mun Hospital, Tuen Mun, Hong Kong, SAR China

Objective: Current evidence does not support abrupt termination of denosumab for high-risk osteoporotic patients due to the rapid BMD decline after cessation. However, for frail elderly patients with poor functional status or limited life expectancy, denosumab may not provide additional clinical benefits. This study aims to look for any clinical fracture and fall admission in frail elderly within their surviving period for up to 3 y after deprescription of denosumab.
Methods: This is a retrospective case series. All elderly patients on denosumab for osteoporosis under the care of Tuen Mun Hospital Geriatric team, who subsequently had denosumab deprescribed between 2015–2020 due to doubtful clinical benefits because of advanced frailty or terminal illnesses were recruited. Exclusion criteria included patients who had denosumab discontinued due to treatment escalation to anabolic agents, or patient's refusal to treatment. Any occurrence of fracture and fall admission within 3 y of surviving period after deprescription were reviewed.
Results: A total of 30 patients were recruited with a median age of 85.5. 83.3% were female. 90% had previous history of fragility fracture. The median Clinical Frailty Scale was 7 (I.Q.R. 7–8) upon termination of denosumab. 24 (80%) had denosumab terminated due to frailty, 2 (6.7%) due to end stage renal failure, 1 (3.3%) due to malignancy. Only 5 (16.7%) had received bridging therapy with bisphosphonate for a median duration of 12 months. Among all 30 patients, none (n = 0) had had any clinical fracture or fall admission within their surviving period for up to 3 y after termination of denosumab. At 3 y, 21 (70%) had died with a median survival of 10 months, with pneumonia being the commonest cause (66.7%).
Conclusion: Clinical fractures and falls are unlikely to occur after termination of denosumab in elderly with advanced frailty or life-limiting diseases within their surviving period for up to 3 y, justifying deprescription due to limited benefits.

P438
THE RISK FACTORS OF OSTEOPOROTIC FRACTURES OVER 10 YEARS OF FOLLOW-UP IN WOMEN AGED OVER 50 YEARS IN THE SIBERIAN POPULATION

E. Mazurenko[1], O. Rymar[1], L. Shcherbakova[1], S. Malyutina[1]

[1]Research Institute of Internal and Preventive Medicine-Branch of the Institute of Cytology and Genetics, Siberian Branch of Russian Academy of Sciences, Novosibirsk, Russia

Objective: To study the frequency of osteoporotic fractures (OF) over 10 y of follow-up and risk factors for OF up in women aged over 50 y (Novosibirsk).
Methods: In 2003–2005, a screening examination of persons aged 45–69 (n = 9360) was carried out within the framework of the international project HAPIEE (Novosibirsk). The information was collected on OF during the last 12 months and risk factors for OF, registration of sociodemographic data, anthropometry, and a study of biochemical blood parameters. In 2017–2018 on the second examination (n = 828), data on the frequency of OF that occurred over 10 y of observation were retrospectively collected. The analysis included 340 postmenopausal women who were 50–69 years old at the 1st screening (2003–2005) of the project. Statistical analysis was carried out by SPSS package (v.13.0).
Results: Among studied 340 women (mean age 59.3 ± 5.1), OF occurred in 13.2% subjects during the 10-y follow-up. Women with a history of OF during 10 y of follow-up had lower weight (p = 0.021), BMI (p = 0.018), waist circumference (p = 0.037), hip circumference (p = 0.050) compared with women without OF. Women with OF were more likely to be overweight (BMI 25–30 kg/m^2) (p = 0.029), while women without OF were more likely to have BMIs characteristic of obesity (p = 0.004), as well as women with OF smoked more often (p = 0.032) and had falls in the last 12 months (p = 0.023) than women without OF. According to the results of a multivariate analysis in women, the risk of OF associated with a smoking (OR = 4.003 (95% Cl = 1.29–12.46), Ca consumption < 1000 mg/d (OR = 2.320 (95% Cl = 1.01–5.34), falls (OR = 2.834 (95% Cl = 1.07–7.53) while BMI is negatively associated with OF (OR = 0.914 (95% Cl = 0.85–0.99) independent of other factors.
Conclusion: In the studied sample of postmenopausal women aged over 50 y, a high frequency of new cases of OF over 10 y of follow-up was revealed, which amounted to 13.2%. The risk of OF increased 4 times with smoking, 2 times with Ca consumption < 1000 mg/d and a falls, and decreased with an increase in BMI.
Acknowledgement: The study was supported by State target №AAAA-A17-117,112,850,280–2.

P439
MINERAL DENSITY BONE TISSUE DISORDER IN CASE OF INFLAMMATORY BOWEL DISEASES: LITERATURE REVIEW

E. Myasoutova[1]

[1]Republican Clinical Hospital, Kazan, Russia

Inflammatory bowel diseases (IBD), which include Crohn's disease (CD) and ulcerative colitis (UC), are chronic, recurrent diseases of unclear etiology characterized by immune inflammation of the mucous membrane of the gastrointestinal tract (GI tract) with the development of local and systemic complications.

The purpose of this review is to study the frequency of development, risk factors and mechanisms of formation of a decrease in BMD in patients with IBD, the role and place of biochemical markers of bone remodeling and densitometry in determining the risk of developing such disorders.

In general, all effects on bone metabolism are realized through the main regulatory systems of osteoblastogenesis (canonical WNT signaling pathway) and osteoclastogenesis (RANKL/RANK/OPG).

The RANK/RANKL/OPG ligand receptor system is a key link in bone tissue homeostasis, directly regulating osteoclast differentiation and osteolysis. RANKL is produced by osteoblasts and activated T lymphocytes. This protein binds to a specific RANK receptor located on osteoclasts and dendritic cells. RANKL acts as the main stimulating factor in the formation of mature osteoclasts, therefore, an increase in its expression leads to bone resorption and, consequently, bone loss.

The main biochemical markers of bone remodeling, which are most justifiably determined in clinical practice, are osteocalcin and P1NP (markers of bone formation), β-Cross Laps (marker of bone resorption). The "gold standard" for the diagnosis of osteoporosis, based on the measurement of BMD, is considered to be densitometry of the lumbar spine and femoral neck DXA.

According to the scientific literature, the incidence of osteopenia and osteoporosis in patients with IBD varies from 22–77% and from 17–41%, respectively.

BMD disorders occur in more than half of patients with IBD. Some authors believe that IBD itself should also be considered as an independent risk factor for osteoporosis and osteoporotic fractures. However, today there are different points of view about the causes and specific risk factors for osteoporosis in CD/UC. Thus, according to a number of studies, the course of IBD has a particularly significant effect on the state of bone tissue, including their debut in adolescence, exacerbations of these diseases, eating disorders, decreased muscle and fat mass, taking systemic glucocorticoids and genetically engineered biological drugs.

P440
GENETIC DETERMINANTS OF TRANSFORMATION OF HYPERURICEMIA INTO GOUT

E. Panina[1], M. Eliseev[1], O. Zhelyabina[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To identify the association of genetic polymorphisms with the risk of the appearance of monosodium urate crystals (MSU), which have pro-inflammatory potential.
Methods: A single-center case–control study included patients aged ≥ 18 y with hyperuricemia (uric acid (UA) level > 360 μmol/L). The examination included collecting an anamnesis (including the use of urate-lowering drugs), examination, anthropometric data (height, weight, BMI), determination of the level of uricemia, ultrasound (GE Voluson E10 device, Austria) of the foot joints to identify deposits of MSU crystals. The presence of MSU crystals was considered reliable when the "double contour" sign, the "blizzard" symptom and the presence of periarticular/intraosseous deposits of MSU crystals were detected according to ultrasound. The diagnosis of gout was based on the 2015 ACR/EULAR criteria; patients who did not meet these criteria were diagnosed with asymptomatic hyperuricemia (AHU). All patients also had blood samples taken for genotyping of polymorphisms of the SLC2A9 (rs1014290), NLRP3 (rs10754558), TLR4 (rs2149356), IL-1β (rs1143623), ABCG2 (rs2231142) genes. Statistical analysis of the obtained data was carried out using the application package Statistica 12.0, Biostatistics (StatSoft Inc., USA).
Results: 166 patients with a mean age of 48.5 ± 12.3 y were included: 83 (50%) patients with AHU and 83 (50%) patients with gout. The groups are comparable by age and gender. BMI in both groups corresponded to obesity (30.0 ± 5.0 kg/m^2 in the gout group vs. 30.4 ± 7.2 kg/m^2). The average sUA level was 469.5 ± 85.7 μmol/l; in the group of gout it was expectedly higher (497.1 ± 95.5 vs. 440.9 ± 62.9 μmol/l) in the AHU group, p = 0.04). MSU crystals in the metatarsophalangeal joints were found in 17 (20.4%) patients with AHU and 57 (68.6%) patients with gout (p = 0.01), despite taking urate-lowering drugs in 64.7% of cases among the latter. Differences in the distribution of genotypes of the NLRP3 and ABCG2 genes between two groups were found to be approaching statistically significant (p = 0.049 and p = 0.059, respectively). The genotype–phenotype analysis revealed a statistically significant association of NLRP3 gene polymorphism with the risk of crystals in the metatarsophalangeal joints in gout (OR = 5.33 [1.22–24.85], p = 0.01), while in AHU such an association was not identified.
Conclusion: NLRP3 gene polymorphism is one of the factors responsible for the deposition of MSU crystals in gout, but not in AHU. Thus, it can be considered a predictor of the transformation of AHU into gout. However, larger studies of genotype–phenotype relationships are needed.

P441
CLINICAL FEATURES OF KNEE OSTEOARTHRITIS IN PATIENTS WITH GOUT AND ASYMPTOMATIC HYPERURICEMIA

E. Panina[1], M. Eliseev[1], O. Zhelyabina[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To study the characteristics of the knee joints osteoarthritis (OA) depending on the stage of hyperuricemia.
Methods: A single-center case–control study included patients aged ≥ 18 y with various stages of hyperuricemia (uric acid (UA) level > 360 μmol/L): asymptomatic hyperuricemia (AHU) or gout. The examination included collecting anamnesis (including taking urate-lowering drugs (ULD) and colchicine), anthropometric data (height, weight, BMI), determining the level of pain in knee joints using a visual analogue scale (VAS), blood test for UA levels, and performing radiography (TeleCord MT Plus device, Russia) of the knees joints to determine the radiological stage of OA according to Kellgren-Lawrence. The diagnosis of gout was based on the 2015 ACR/EULAR criteria; patients who did not meet these criteria were diagnosed with AHU. All patients underwent measurement of the HAQ, WOMAC, M. Lequesne and EQ-5D indices. Statistical analysis of the obtained data was carried out using the application package Statistica 12.0, Biostatistics (StatSoft Inc., USA).
Results: A single-center case–control study included 202 patients: 101 (50%) patients with AGU and 101 (50%) patients with gout. Patients from the AHU and gout groups were comparable in gender,

age (mean age 48.9 ± 13.7 y), height, weight and BMI (29.8 ± 5.3 kg/m^2), which corresponded to excess body weight. The frequency of taking ULD and colchicine, which were more often prescribed to patients with gout, differed as expected ($p < 0.01$). Laboratory examination showed significantly higher levels of UA in the gout group compared to the AHU group (448.41 ± 64.8 vs. 518.1 ± 52.6 μmol/L, respectively). Knee OA according to Kellgren-Lawrence was found in 61 (60.4%) patients with AHU and 53 (52.5%) patients with gout, however, advanced stages of OA (3 and 4 according to Kellgren-Lawrence) were more often found among patients with gout ($p = 0.002$).

Conclusion: Knee OA occurs in more than half of patients with elevated uric acid levels. In gout, it is characterized by more advanced radiological stages, and is also accompanied by more intense pain and functional impairment.

P442
CLINICAL FEATURES OF PATIENTS WITH CALCIUM PYROPHOSPHATE CRYSTAL DEPOSITION DISEASE IN THE PRESENCE OF HYPERURICEMIA

E. Panina[1], M. Eliseev[1], O. Zhelyabina[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To compare the incidence of cardiovascular diseases and conditions among patients with calcium pyrophosphate crystal deposition disease (CPPD) and hyperuricemia (HU) and CPPD without HU.

Methods: A single-center study included patients with a definite diagnosis of CPPD. All patients underwent history taking, examination, determination of joint pain using a visual analogue scale (VAS), phenotyping for acute or chronic arthritis and uricemia level. The level of hsCRP (norm < 5 mg/l), creatinine (norm < 106 μmol/l), serum uric acid (sUA) (norm < 360 μmol/l) was determined. GFR was calculated using the CKD-EPI formula. Concomitant diseases were recorded if there was a corresponding entry in the medical document. Statistical analysis of the obtained data was carried out using the application package Statistica 12.0. Biostatistics (StatSoft Inc., USA).

Results: The study included 258 patients over 18 years old with a definite diagnosis of CPPD: 155 (60.0%) women, 103 (40.0%) men; of these, 112 (43.4%) patients had an increase in sUA levels, 146 (56.6%) patients did not. A comparison of patients with CPPD and HU and CPPD without HU is shown in the Table below.

Comparable characteristics	HU (n=112)	Normouricemia (n=146)	p
Gender. m/f. n	42/104	61/51	<0.00001*
BMI >25 kg/m^2. n (%)	54 (48.2)	49 (33.6)	0.0041*
BMI >25 kg/m^2. n (%)	91 (81.3)	95 (65.1)	0.017*
AH. n (%)	86 (76.8)	75 (67.0)	<0.00001*
IHD. n (%)	39 (34.8)	35 (24.0)	0.056
AMI. n (%)	5 (4.5)	3 (2.1)	0.27
Stroke. n (%)	5 (4.5)	6 (4.1)	0.89
CHF. n (%)	22 (19.6)	11 (7.5)	0.039*
GFR <60 ml/min. n (%)	16 (14.3)	8 (5.5)	0.016*
DM 2 type. n (%)	21 (18.8)	16 (11.0)	0.077
CRP >2 mg/l. n (%)	70 (62.5)	73 (50.0)	0.045*
Chronic arthritis. n (%)	72 (64.2)	93 (43.1)	0.92
Acute arthritis. n (%)	31 (27.7)	33 (22.5)	0.35
Pain according to VAS. mm (M±SD)	57.8±13.1	55.6±15.4	0.075

*p <0,05

Conclusion: CPPD is often combined with HU. This combination predetermines a high likelihood of concomitant diseases and metabolic disorders (obesity, AH, CHF), as well as a chronic inflammatory process (hsCRP > 2 mg/l). The relationship between HU and the clinical manifestations of CPPD has not been identified. The frequency of arthritis attacks in the formed groups also did not differ, amounting to an average of 4 arthritis attacks per year in each group ($p = 0.98$).

P443
ANAKINRA IN THE TREATMENT OF CALCIUM PYROPHOSPHATE CRYSTAL DEPOSITION DISEASE

E. Panina[1], M. Eliseev[1], O. Zhelyabina[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To evaluate the effectiveness of a short course of anakinra in calcium pyrophosphate crystal storage disease (CPPD).

Methods: The prospective study included patients with a definite diagnosis of CPPD who did not respond to therapy with NSAIDs, colchicine, corticosteroids and disease-modifying drugs. The examination included anthropometry, determination of pain intensity on a visual analogue scale (VAS), the number of painful (PBS) and swollen (SPS) joints out of 44, and the disease activity index DAS44. The level of CRP and ESR were determined. Each patient was prescribed anakinra at a dose of 100 mg/d. in a week. If severe pain occurred, patients could take NSAIDs. Follow-up visits were scheduled at 1, 2, and 8 weeks after initiation of anakinra therapy. The dynamics of laboratory parameters and examination data were recorded. Statistical analysis of the obtained data was carried out using the application package Statistica 12.0, Biostatistics (StatSoft Inc., USA).

Results: 5 patients with a definite diagnosis of BDP were included: 4 (80%) women and 1 (20%) man. The average age among patients was 59.0 ± 6.4 y; the average BMI was 28.4 ± 6.9 kg/m^2, which corresponds to pre-obesity; the average PBS and SPS before anakinra administration was 5.2 [2.0; 8.0] and 2.0 [2.0; 2.0] respectively; the average pain level according to VAS was 60.0 ± 9.4 mm. The average values of inflammatory markers before treatment were: ESR: 35.6 ± 6.2 mm/h and CRP 5.9 ± 1.3 mg/l. After the end of treatment with anakinra, a decrease in the number of heart rate and heart rate was noted (3.2 [0.0; 4.0] and 1.2 [0.0; 2.0], respectively), pain intensity by 2 times, and the level of inflammatory markers: ESR 13.4 ± 6.1 mm/h and CRP 3.3 ± 1.9 mg/l. The average DAS44 index decreased by 1.75 times. However, upon closer examination of the treatment results, it was noted that in 2 patients the effect of anakinra therapy was incomplete—arthritis and elevated levels of laboratory markers of inflammation persisted.

Conclusion: Anakinra has a beneficial effect in the treatment of CPPD when other treatments are ineffective, but some patients do not respond to this therapy. Larger studies are required.

P444
WHAT FACTORS AFFECTED THE SELF-REPORTED HEALTH STATUS OF PATIENTS WITH RHEUMATOID ARTHRITIS IN REAL CLINICAL PRACTICE? SURVEY DATA

E. Polishchuk[1], A. Karateev[1], A. Potapova[1], E. Filatova[1], V. Amirdzhanova[1]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Patient acceptable symptom state (PASS) is a simple way to assess the health status and therapy effect from the patient's point of view and is well suited for clinical practice. We aimed to evaluate factors affecting PASS in RA patients in real clinical practice according to the survey data.
Methods: A survey of patients with RA was carried out using an electronic form of a questionnaire posted on the website of the V.A. Nasonova Research Institute of Rheumatology in the period from January to June 2023. A total of 945 people took part in the survey. 87.8% were female, mean age 46.3 ± 13.2 y, disease duration 6[3;14] y. Most of them (80.4%) were receiving conventional synthetic disease-modifying antirheumatic drugs (csDMARDs), 23.9%—biological DMARDs (bDMARD) and JAK inhibitors, 36.5% were receiving glucocorticoids (GCs) and 69.1% NSAIDs. The patients rated the severity of joint pain, fatigue, anxiety, depression, daily activity limitation, global health (GH) and global disease activity (GDA) in the past 2 weeks using a numerical rating scale (NRS) from 0–10 points. Patients' satisfaction with their condition was determined using the PASS. To do this, the patient answered "YES" or "NO" to the question, "Taking into account all you have to do during your daily life, your level of pain, and your functional impairment, do you consider that your current state is satisfactory?".
Results: According to the survey, 54.8% of patients were satisfied with their condition (PASS +). PASS " + " and PASS "−" patients were comparable in age (46.9 ± 12.7 and 45.6 ± 13.6 years, respectively, p = 0.08) and disease duration (6[3;14] and 6[2;13] years, respectively, p = 0.29), but in the group of PASS " + " they had significantly lower levels of pain, fatigue, anxiety, depression, were less restricted in daily activities and had significantly better GH and GDA scores ($p \leq 0.05$). The most significant factors associated with PASS "−" were severity of pain OR 2665 (95% CI 2072–3429), fatigue 2497 (1818–3430), anxiety 1683 (1395–2029), and depression 1537 (1308–1805) > 4 points on the NRS, intake of NSAIDs 1305 (1103–1544) and GCs 1185 (1029–1363); in contrast, bDMARD and JAK inhibitors intake were associated with PASS " + " 0.779 (0.647–0.938).
Conclusion: The most significant factors affecting self-assessment of RA patients' health status in real clinical practice were the severity of pain, fatigue, anxiety and depression.

P445
EFFICACY AND SAFETY OF CELECOXIB, DIACEREIN AND GLUCOSAMINE-CHONDROITIN COMBINATION FOR THE CONTROL OF MUSCULOSKELETAL PAIN ASSOCIATED WITH OSTEOARTHRITIS AND CHRONIC LOW BACK PAIN

E. Polishchuk[1], A. Karateev[1]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Co-administration of drugs with different mechanisms of action is an important approach to controlling musculoskeletal pain in rheumatic diseases. However, there are only a small number of studies evaluating the efficacy of this approach in real practice. We aimed to evaluate the efficacy and safety of the combined use of celecoxib, diacerein and glucosamine—chondroitin combination in osteoarthritis (OA) and chronic low back pain (LBP).
Methods: Data from a 3-month open-label observational study were analyzed. We included 1569 patients, 63.6% women and 36.4% men, age 58.7 ± 11.0 y, with knee OA, hip OA hand OA and chronic LBP experiencing moderate/severe pain (≥ 4 on a numeric rating scale, NRS 0–10) and requiring NSAIDs. Patients took celecoxib 400 mg/d with dose reduction to 200 mg/d and "on-demand" use after significant pain reduction; diacerein 100 mg/d and glucosamine 250 mg—chondroitin 200 mg 2 caps. 2 times daily. The results were assessed at 3 months using the dynamics of pain, fatigue, functional impairment (NRS) and the patient-acceptable symptom state (PASS) parameter.
Results: 80.2% of patients completed the 3-month treatment course, 4.4% discontinued treatment due to adverse events (AEs) and 15.4% were lost to follow-up. At 3 months, a reduction of ≥ 50% from baseline in the severity of pain on movement was observed in 83.4%, pain at rest in 83.7%, pain at night in 78.6%, functional limitation in 80.8%, fatigue in 83.4%. PASS was noted in 87.7% of patients. There was no significant difference in treatment outcomes for different localisations of OA and LBP: ≥ 50% pain reduction was achieved in 81.6% of knee OA patients, 82.2% of hip OA patients, 85.0% of hand OA patients, 88.1% of LBP patients. AEs were reported in 350 patients (22.4%), the most common being dyspepsia in 280 patients (17.8%). Diarrhoea was reported in 37 patients (2.4%). There were no serious complications requiring hospitalisation.
Conclusion: Combined therapy with celecoxib, diacerein and glucosamine-chondroitin significantly reduces symptoms of OA and LBP.

P446
COMPLEX DECISION-MAKING HIP REREVISION ARTHROPLASTY CASE OF PJI IN DIABETIC AND OSTEOPOROTIC ELDERLY MALE PATIENT

E. Popescu[1], C. E. Georgescu[1], A. Dimitriu[2], B. Bolos[1], R. Ene[2]

[1]Bucharest Emergency Clinical Hospital, Orthopaedics Dept., Bucharest, Romania, [2]Bucharest Emergency Clinical Hospital, Orthopaedics Dept., "Carol Davila" Univ. of Medicine and Pharmacy, Bucharest, Romania

Objective: THA is one of the most successful surgical procedures with documented survivorship at up to 25 years thus increasing the need for RHAs [1]. However, the increase of THA cases and the increase of life expectancy increases the RHA need with various causes such as infection, corrosion, wearing, poor osseointegration, periprosthetic fractures, therefore the demand for metallic materials in medical devices is large [2]. Ti-based materials combined with Co and Cr are highly compatible and are widely used as orthopedic implant materials in clinical practices such as hip joint and knee replacement due to their superior mechanical properties, good wear, and corrosion resistance [3] which leads to less inflammatory response [4] and hydroxyapatite coatings are widely used as a coating material for metal implants because of its bioactivity and osteoconductivity, which are similar to those of natural human bone [5,6,7]. Besides local factors the general factors provided by the patient, such as diabetes, smoking, alcohol abuse and osteoporosis as testosterone deficit increases bone resorption in male patients [8,9] can also influence the final outcome. The potential of biological fixation and improved implant designs have led to an increasing worldwide use of cementless components in revision THA including two-stage exchange procedures for PJI [10,11]. Interval between stages can range from 6 weeks to several months and PJI are very challenging for every surgeon skilled in prosthetic surgery and it's necessary to make an exact preoperative diagnosis and to treat them with the proper technique [12]. Our case report presents the challenges of

successfully treating the PJI and restore the limb functionality were represented by a multitude of local and general factors that influenced our decision making process in regards to the best available option for this patient.

Methods: We present the complex case of a diabetic, heavy smoking, alcoholic, osteoporotic normal BMI, 80 yo male patient with delayed onset *E. cloacae* ESBL positive PJI after cementless THA for femoral neck fracture and after a cemented femoral stem revision and ORIF for Vancouver A2 femoral fracture. The patient presented in our service at 8 months after his last surgery accusing the appearance of a thigh fistula, pain, fever and limb shortening on the affected side and with elevated ESR, CRP and Fibrinogen levels. We had a lot of tough treatment choices and investigations to make but we will further present the most important ones. The hardest first choice we had to make was represented by adopting the one stage vs. two stage revision approach regarding the fact that the patient had an ESBL + type of infection which was an indication for the two stage revision, but the patient already had osteoporosis which could also worsen with time with the two-stage revision wait interval increasing the osteoporosis levels the patient's risk for periprosthetic fractures and the fact that he was a non-compliant patient (he was not interested in any of the solutions for controlling the diabetes, smoking and alcohol ceasing or further osteoporotic treatment we provided no matter how hard we tried to make him understand that these are also connected to his overall orthopedic problem). We finally decided for the two stage revision approach using a Vancomycin and Gentamicin impregnated hip spacer and after 6 months we were able to plan for the second stage of the revision surgery without any local complications encountered in these months, when it was time for the second hard choice between cemented (primary stability, further antibiotics local delivery with the risk of non-union in case of a new fracture during the surgery) and cementless (secondary stability, bioconductivity advantages regarding his osteoporotic status), knowing that the periprosthetic fracture was still highly possible during the surgery so we finally decided on a cemented cup and cementless modular femoral stem option. Of course, during our second surgery he suffered a distal femoral diaphysis fracture which also needed ORIF in addition to the cementless modular stem.

Results: After the surgery the patient was finally convinced that the osteoporosis had a negative impact on his overall evolution, prolonging his rehabilitation protocol with a 2 month non weight bearing and started taking the specific treatment. We did not encounter any problems during the rehabilitation protocol, but we noticed a mild local inflammatory reaction at 5 days postop (skin redness) which was a scare, but 14 months after the surgery the ESR, CRP and Fib levels are normal (tested every 3 months interval), he has no pain and he recovered 85% of his lower limb mobility. The X-rays show no implant migration and the fracture is fully healed.

Conclusion: This case highlights the necessity to properly evaluate the patient specific risk factors and treatment options in order to address all possible scenarios and proper, up to date preoperative planning.

Abbrecccviations: THA-total hip arthroplasty, RHA-revision hip arthroplasty, Ti-titanium, Co-cobalt, Cr-chromium, PJI-prosthetic joint infection, ESR-erythrocyte sedimentation rate, CRP-C-reactive protein, ORIF-open reduction and internal fixation

References:

1. Kinov P, Tivchev P. Arthroplasty-Update 2013, https://doi.org/10.5772/53249.
2. Mirea R, et al. Metals 2021;11:857
3. Mirea R, et al. Materials 2021;14:2774
4. Lupescu O, et al. Rom J Morphol Embryol 2016;57:1137
5. Li X, et al. Int J Nanomedicine 2023;18:5031
6. Tisler CE, et al. Polymers 2022;14:2969
7. Chen X, et al. Mater Today Bio 2023;19:100586
8. Golds G, et al. Int J Endocrinol 2017;2017:4602129
9. Popescu D, et al. Acta Endo (Buc) 2015;11:109
10. Hipfl C, et al. Arch Orthop Trauma Surg 2023;143:4481
11. Alrayes MM, Sukeik M. World J Orthop 2023;14:113
12. Franceschini M, et al. Ann Joint 2022;7:4

P447
EFFICACY OF REHABILITATIVE TREATMENTS ON FUNCTIONALITY IN DAILY LIFE ACTIVITIES IN PATIENTS WITH FIBROMYALGIA: A SYSTEMATIC REVIEW OF RANDOMIZED CONTROLLED TRIALS

E. Prestifilippo[1], N. Marotta[2], R. Zito[1], I. Bartalotta[1], L. Lippi[3], M. Invernizzi[3], A. Ammendolia[1], A. De Sire[1]

[1]Dept. of Medical and Surgical Sciences, Univ. of Catanzaro "Magna Graecia", Catanzaro, [2]Physical and Rehabilitative Medicine, Dept. of Experimental and Clinical Medicine, Univ. of Catanzaro "Magna Graecia", Catanzaro, [3]Dept. of Health Sciences, Univ. of Eastern Piedmont "A. Avogadro", Novara, Italy

Objective: This study investigated the efficacy of rehabilitation interventions in relieving symptoms and improving functionality in individuals with fibromyalgia, a debilitating condition characterized by persistent pain. This systematic review and meta-analysis aimed to clarify the impact of diverse therapeutic methods, providing valuable insights into managing functional limitations associated with fibromyalgia.

Methods: The systematic literature review was conducted on PubMed, Scopus, and Web of Science. The focus was on randomized controlled trials (RCTs) involving fibromyalgia patients undergoing various rehabilitative interventions, including physiotherapy, transcutaneous electrical nerve stimulation (TENS), acupuncture, and more. The Fibromyalgia Impact Questionnaire (FIQ) measured outcomes, evaluating the condition's impact on daily activities. Cochrane Risk of Bias tool assessed RCTs' bias risks.

Results: A comprehensive screening identified 23 studies with 1283 participants, 660 in intervention and 623 in control groups. Seven approaches were studied, including exercise, hydrotherapy, acupuncture, low-level laser therapy (LLLT), electromagnetic therapy, TENS, whole-body vibration (WBV), and exergaming. Meta-analysis revealed significant FIQ-10 improvements with hydro-kinesitherapy, tMS, LLLT, and WBW (MD decrease of ES: − 11.74). Limited impact for electromagnetic therapy, exergames, and exercise. FIQ-8 showed a small but significant improvement (MD decrease of ES: − 7.95), while FIQ-R significantly improved with Physical Exercise/Therapy (MD decrease of ES: − 17.70). Risk of bias analysis found 86.3% high-quality randomization, 59% low risk for missing data, and an overall 46.5% low bias risk.

Conclusion: This systematic review highlights the efficacy of rehabilitative interventions in improving the functioning and daily life activities of fibromyalgia patients. Given the condition's debilitating nature, the findings advocate for integrating these approaches into a comprehensive care strategy, emphasizing tailored, multidisciplinary interventions to address fibromyalgia's complex challenges.

P448
EFFICACY OF OXYGEN-OZONE THERAPY IN COMBINATION WITH DIFFERENT REHABILITATIVE TREATMENTS ON PAIN IN PATIENTS WITH LOW BACK PAIN: PILOT RANDOMIZED CONTROLLED TRIAL

E. Prestifilippo[1], N. Marotta[2], A. Vimercati[1], S. Fasano[3], L. Lippi[4], M. Invernizzi[4], A. De Sire[5], A. Ammendolia[5]

[1]Dept. of Medical and Surgical Sciences, Univ. of Catanzaro "Magna Graecia", Catanzaro, [2]Physical and Rehabilitative Medicine, Dept. of Experimental and Clinical Medicine, Univ. of Catanzaro "Magna Graecia", Catanzaro, [3]Physical and Medical Rehabilitation Unit, Univ. Hospital "Renato Dulbecco", Catanzaro, [4]Dept. of Health Sciences, Univ. of Eastern Piedmont "A. Avogadro", Novara, [5]Dept. of Experimental and Clinical Medicine, Univ. of Catanzaro "Magna Graecia", Catanzaro, Italy

Objective: This pilot randomized controlled trial aimed to assess the efficacy of combination of oxygen-ozone therapy (O2O3) and proprioceptive neuromuscular facilitation (PNF) program vs. O2O3 plus Back School physiotherapy in terms of pain relief in low back pain patients.
Methods: Adults (age $>$ 18 y) with low back pain (with a numeric rating scale, NRS score $\geq$ 4) were randomized into two groups. Both groups received 8 sessions of intramuscular-paravertebral lumbar injections over 8 weeks, followed by physiotherapy. The study group underwent PNF rehabilitation, whereas the control group underwent Back School rehabilitation. Outcomes were: NRS for pain, Oswestry Disability Index (ODI) for disability, and EuroQol for quality of life at the following timepoints: T0 (baseline), T1 (after O2O3 therapy), T2 (after physiotherapy), and T3 (at 3 months at end of treatment).
Results: 20 patients (mean age: 65.3 $\pm$ 19.0 y) showed significant pain improvement in both groups at T3 (PNF: 8.5 $\pm$ 1.35 vs. 5.4 $\pm$ 2.3, p = 0.02; Back School: 7.9 $\pm$ 1.4 vs. 3.4 $\pm$ 2.0,p = 0.02). PNF group exhibited significant quality of life improvement at T1 (0.325 $\pm$ 0.226 vs. 0.625 $\pm$ 0.232, p = 0.04), while the Back School group showed non-significant change at T1 (0.479 $\pm$ 0.224 vs. 0.698 $\pm$ 0.176, p = 0.06). ODI significantly improved in both groups (PNF: T0–T1 p = 0.04, T0–T2 p = 0.03; Back School: T0–T1 p = 0.04, T0–T2 p = 0.03, T0–T3 p = 0.03). No significant between-group differences were observed.
Conclusion: O2O3 therapy demonstrated significant pain, disability, and quality of life improvement in all patients. Although there were no significant intergroup differences, intragroup improvements suggested the efficacy of O2O3 therapy independently from the following rehabilitation type in reducing low back pain.

P449
THE COMBINATION OF PSORIATIC ARTHRITIS WITH OSTEOPOROSIS

E. Russu[1], L. Liliana[1], L. Chişlari[1], A. Nistor[1], M. Homiţchi[2], L. Gonţa[3], L. Dutca[1]

[1]"Nicolae Testemitanu" State Medical and Pharmaceutical Univ., [2]"Timofei Mosneaga" Republican Clinical Hospital, Laboratory of Rheumatology, [3]Republican Diagnostic Center, Chisinau, Moldova

Objective: The prevalence of osteoporosis in psoriatic arthritis (PsA) is poorly understood, and the mechanism of its development has not yet been elucidated. It is assumed that the severity of the disease, the age of the patient, and chronic autoimmune inflammation may play a role in its pathogenesis in this disease. Aim of the study was to investigate the prevalence of osteoporosis in psoriatic arthritis.
Methods: 81 patients with PsA aged 32–59 y were examined, predominantly men under the age of 50 (70%), the mean age was 44.7 $\pm$ 5.5 y. Diagnosis was carried out in accordance with the CASPAR criteria.
Results: According to DXA osteodensitometry, osteoporosis and osteopenia (4.1 $\pm$ 1.3 vs. 3.4 $\pm$ 0.8, $p < 0.01$) are a common complication of PsA, its signs were detected in 60% of patients. Osteoporosis are more likely to develop in patients with high PsA activity ASDAS-CRP (3.9 $\pm$ 0.5 vs. 2.9 $\pm$ 0.3, $p < 0.01$), BASDAI (5.1 $\pm$ 0.7 vs. 3.5 $\pm$ 0.9, $p < 0.01$), severity, duration of the disease, rheumatoid-like form, systemic manifestations, receiving glucocorticosteroids per os and having a low BMI.
Conclusion: Osteoporosis is a common complication of psoriatic arthritis. The development of osteoporosis in this disease is associated with high activity, severity of the pathological process, and the use of glucocorticosteroids. Patients with psoriatic arthritis complicated by osteoporosis have more severe bone pain than patients without osteoporosis.

P450
BONE MINERAL DENSITY IN PCOS: NEW INSIGHTS INTO HYPERANDROGENISM AND HYPERINSULINEMIA

C. P. Lopes[1], G. A. R. Maciel[1], G. D. N. Maffazioli[1], E. S. Ferreira-Filho[1], R. F. Macchione[1], E. M. D. Neves[1], J. M. Soares-Junior[1], R. M. R. Pereira[2], E. C. Baracat[1]

[1]Disciplina de Ginecologia, Faculdade de Medicina FMUSP, Universidade de Sao Paulo, [2]Disciplina de Reumatologia, Faculdade de Medicina FMUSP, Universidade de Sao Paulo, Sao Paulo, Brazil

Objective: Polycystic ovary syndrome (PCOS) is a complex gynecological, reproductive, endocrine and metabolic disease whose pathophysiological mechanisms, such as chronic anovulation, hyperandrogenism, and hyperinsulinemia, may affect BMD (BMD). However, the impact of PCOS on bone metabolism is poorly understood. We aimed to analyze the BMD and body composition in patients with PCOS, where one of the criteria to be considered is hyperandrogenism, and to compare to women without the syndrome.
Methods: A cross-sectional study was carried out with 21 women with PCOS and 19 women without the syndrome. All women were using combined hormonal contraceptives. Statistical analysis was performed in the STATA program.
Results: The groups were homogeneous and there was no statistically significant difference in mean age (p = 0.91) and BMI (p = 0.10). The BMD in the PCOS and control groups were, respectively, 1.300 vs. 1.150 g/cm^2, p = 0.01 for lumbar spine, 1.068 vs. 0.920 g/cm^2, p = 0.01 for femoral neck and 1.135 vs. 0.964, p = 0.002 g/cm^2 for total femur. In our sample, there was higher BMD in all studied areas in PCOS subjects, who had higher testosterone levels. As for body composition, the percentage of total fat in the PCOS and control groups was 40.2 vs. 41.6%, p = 0.41, and the visceral adipose tissue component seemed to be higher in PCOS (785 vs. 474 g, p = 0.07), although not statistically significant. The analysis of bone characteristics among participants with PCOS, with and without insulin resistance, showed a decrease in BMD of the femoral neck only (1.124 vs. 0.950 g/cm^2, p = 0.01) in the group with insulin resistance, although it was not significant after controlling for BMI.
Conclusion: BMD in the total femur, femoral neck and lumbar spine of patients with PCOS was higher than those without the syndrome.

P451
A PROMISING STRATEGY FOR THE DIAGNOSIS, TREATMENT AND PREVENTION OF OSTEOPOROSIS: EMS STRATEGY

E. Shahrour[1]

[1]Tishreen Univ., Latakia, Syria

Objective: The challenges facing DXA in the assessment of osteoporosis call for more search for useful methods and strategies. A real scientific revolution to find appropriate solutions (radiological studies, genetic studies and bioinformatics applications) is ongoing. Recently, a new road map between ESCEO & WHO is interested in new strategies to improve the management of osteoporosis around the globe. There is no current application or tool that gives the complete picture of the status of the osteoporotic bone (1). For the picture to be complete, the strategies must give an idea about BMD, microarchitecture of trabecular bone, microarchitecture of cortical bone, environmental risk factors, genetic risk factors, clinical history, organic and inorganic bone formation, osteoblasts and osteoclasts. We need the balance between strength and flexibility of the bone to protect it against fracture. We need the balance between quantity and quality of bone.
Methods: EMS strategy.
1-Bioinformatics application includes results of (DXA, FRAX, GPS, TBS, CBS, CH, OCS, ICS, BCS).

DXA: Dual-Energy X-ray Absorptiometry: BMD.(2)
FRAX: Fracture Risk Assessment: Environmental Risk Factors.(3)
GPS: Genetic Polygenic Score: Genetic Risk Factors.(4)
TBS: Trabecular Bone Score: microarchitecture of trabecular bone.(5)
CBS: Cortical Bone Score: microarchitecture of cortical bone.
CH: Clinical History: Diagnostic Auxiliary Factors.
OCS: Organic Component Score: mechanism of bone matrix formation and elements included in it.(6,7)
ICS: Inorganic Component Score: mineralization mechanism and elements included in it.(8)
BCS: Bone Cell Score: Formation of bone cells and influencing factors.(8)
BCS, OCS, ICS can be obtained from the cellular pathways.
CBS can be obtained from DXA.
Gene classification in GPS App. must be according to their effect on molecular pathways, structure of (cortical/ trabecular bone), component of (organic/inorganic), bone cells(osteoblasts/ osteoclasts).
Bioinformatics application of Genetic Morphology(Morphological characteristics of carriers of the genetic defect). It may be added to the clinical story, as genetics will be involved in every detail in the future.

2-Bioinformatics application includes the exact effect of the current or discovered drugs by the following classification, effect on.

Molecular Pathways (WNT, BMP, NOTCH, RANKL/RANK/OPG)
Cortical bone/Trabecular bone
Organic component/Inorganic component
Osteoblasts/ Osteoclasts
Simple example: Most of the femur is cortical bone and most of the lumbar bone is trabecular bone. In the event that there is a problem in the femur, we go for treatments that affect the cortical bone. In the event of a problem in the lumbar bone, we use medications that affect the trabecular bone. This idea will be good to be associated with TBS osteo.

3- Bioinformatics application decides the optimal treatment and prevention methods for the patient by combining the results of the two previous applications.
Conclusion: EMS strategy fits with the global trends to follow precision medicine and individual treatment. Perhaps this strategy will be useful for diagnosing, treating and prevention for most diseases of the skeletal system.
References:

1. https://www.osteoporosis.foundation/who-esceo-agreement
2. https://www.cdc.gov/nceh/radiation/dexa-scan
3. https://frax.shef.ac.uk/FRAX/
4. Wu Q, Jung J. J Transl Med 2023;21:127
5. https://www.medimapsgroup.com/
6. Fernando R, Outi M. Trends Endocrinol Metab 2016;27:262
7. Shahrour EM. 2023, https://doi.org/10.5772/intechopen.110336
8. Abdalrazak H, Kaser A. Rheumatology Locomotor System Diseases. Latakia, Syria: Tishreen university publications; 2014

P452
GENETIC ASSOCIATION BETWEEN SYMPTOMS OF MILD OSTEOGENESIS IMPERFECTA (OI) AND POSTMENOPAUSAL OSTEOPOROSIS

E. Shahrour[1], B. Al-Halabi[2], A. Dabboul[2], W. Al-Achkar[2], A. A. Hassan[1], A. Khamis[1], H. Yazigi[1]

[1]Tishreen Univ., Latakia, [2]Atomic Energy Commission, Damascus, Syria

Objective: Mild osteogenesis imperfecta OI and postmenopausal osteoporosis are both bone disorders. Mild OI may be associated with postmenopausal osteoporosis. According to NCBI, COL1A2rs72658152 (COL1A2G661S) is a pathogenic proven cause of the association between mild OI and postmenopausal osteoporosis. The challenges facing DXA and the treatment plans of the World Health Organization WHO for osteoporosis require a search for new diagnostic solutions such as genetic methods.
Methods: COL1A2rs72658152 was detected by Restriction Fragment Length Polymorphism RFLP and DNA sequencing on 150 EDTA blood samples from pre- and post-menopause women in Tishreen University Hospital. BMD was measured using DXA. A clinical examination was conducted for the participants. A questionnaire was filled out with information related to the study. Related-Samples McNemar Change Test, chi-square test, and binary logistic regression were used as a statistical method to estimate the correlation between mild OI and postmenopausal (osteopenia or osteoporosis) under 95% confidence level ($\alpha \leq 0.050$) as well as the correlation between (mild OI, postmenopausal osteoporosis or osteopenia) and some morphological characteristics under 95% confidence level ($\alpha \leq 0.050$).
Results: The significant change to the occurrence of mild OI with postmenopausal osteopenia or osteoporosis is 10.8% with a confidence level of 95% or more ($p \leq 0.05$). Strong asymptotic significance of the (2-sided) correlation is found between mild OI, on one hand, and postmenopausal osteopenia or osteoporosis on the other (chi-square = 29.066, $p = 0.000 < 0.05$). Mild OI has a significant impact on postmenopausal osteoporosis or osteopenia ($p = 0.000 < 0.05$). They are in a positive correlation relationship according to the nature of tendency slop (B = 1.758).
Conclusion: Mild OI is associated with postmenopausal osteopenia and osteoporosis with statistical significance with reasons other than COL1A2G661S, and no specific morphological characteristics are found. Postmenopausal osteoporosis is not a primary osteoporosis because there are causes for it to occur. This is contrary to the WHO classification.

P453
EMBODIMENT OF BIOINFORMATICS IN THE DIAGNOSIS AND TREATMENT OF OSTEOPOROSIS: EMS STRATEGY

E. Shahrour[1]

[1]Tishreen Univ., Latakia, Syria

The challenges facing DXA in the assessment of osteoporosis call for more research for useful methods and strategies. A real scientific revolution to find appropriate solutions (radiological studies, genetic studies, and bioinformatics applications) is ongoing [1]. Recently, a new road map was signed between ESCEO and WHO is interested in new strategies to improve the management of osteoporosis around the globe. There is no current application or tool that gives a complete picture of the status of the osteoporotic bone [2].

Material and methods: EMS strategy supports bioinformatics in diagnosing and treating osteoporosis through three bioinformatics applications that may be consistent with the goals of the new roadmap signed between ESCEO and WHO in February 2023. The first one organizes the results of various diagnostic tests currently available and other tests that must be worked on to give a complete picture of the bone. It should give an integrated picture about (BMD, microarchitecture of trabecular bone, microarchitecture of cortical bone, environmental risk factors, genetic risk factors, clinical history, organic and inorganic bone formation, osteoblasts, and osteoclasts). We need the balance between strength and flexibility of the bone to protect it against fracture. We need a balance between the quantity and quality of the bone. It includes results of (DXA, FRAX, GPS, TBS, CBS, CH, OCS, ICS, and BCS) [3]. The following is a definition of these terms:

DXA: dual-energy x-ray absorptiometry: BMD[4].
FRAX: fracture risk assessment: environmental risk factors[5].
GPS: genetic polygenic score: genetic risk factors [6].
TBS: trabecular bone score: microarchitecture of trabecular bone[7].
CBS: cortical bone score: microarchitecture of cortical bone.
CH: clinical history: diagnostic auxiliary factors.
OCS: organic component score: mechanism of bone matrix formation and elements included in it [1, 8].
ICS: inorganic component score: mineralization mechanism and elements included in it [9].
BCS: bone cell score: formation of bone cells and influencing factors [9].

BCS, OCS, and ICS can be obtained from the cellular pathways.

CBS can be obtained from DXA.

Gene classification in GPS app must be according to their effect on the molecular pathways, structure of (cortical/trabecular bone), component of (organic/ inorganic), and bone cells (osteoblasts/ osteoclasts) [3].

Bioinformatics application of the genetic morphology (morphological characteristics of carriers of the genetic defect). It may be added to the clinical story, as genetics will be involved in every detail in the future [10].

The other bioinformatics application focuses on the exact site of effect of the currently available medications and the medications that must be worked on in the future according to their effect on molecular pathways (WNT, BMP, NOTCH, RANKL/RANK/OPG), (Cortical bone/trabecular bone), (Organic component/inorganic component)(Osteoblasts/osteoclasts), etc. To illustrate with a simple example; most of the femur is cortical bone and most of the lumbar bone is trabecular bone. If there is a problem in the femur, we go for treatments that affect the cortical bone. In the event of a problem in the lumbar bone, we use medications that affect the trabecular bone. This idea will be good to be associated with TBS osteo.

Then correlating the results of the previous two applications to a single bioinformatics application which is the third one which may decide the optimal treatment and prevention methods for the patient. Results& **Conclusion**: That may fit with the global trends to follow precisely medicine and individual treatment. Perhaps this strategy will be useful for diagnosing, treating, and preventing most diseases of the skeletal system[3].

References:

1. Shahrour EM. 2023, https://doi.org/10.5772/intechopen.110336
2. https://www.osteoporosis.foundation/who-esceo-agreement
3. Shahrour E (2023). Osteoporos Int 2023;34:1821
4. https://www.cdc.gov/nceh/radiation/dexa-scan
5. https://frax.shef.ac.uk/FRAX/
6. Wu Q, Jung J. J Transl Med 2023;21:127
7. https://www.medimapsgroup.com/
8. Fernando R, Outi M. Trends Endocrinol Metab 2016;27:262
9. Abdalrazak H, Kaser A. Rheumatology Locomotor System Diseases. Latakia, Syria: Tishreen university publications; 2014
10. Shahrour E, et al. https://ymerdigital.com/uploads/YMER2112AB.pdf

P454
VALIDATION OF THE SWISS FRAX MODEL FOR FRACTURE RISK ASSESSMENT USING 10-YEAR FRACTURE DATA FROM THE OSTEOLAUS STUDY

E. Shevroja[1], C. Vendrami[1], G. Gatineau[1], E. Gonzalez Rodriguez[1], O. Lamy[1], D. Hans[1]

[1]Lausanne Univ. Hospital, Lausanne, Switzerland

Objective: FRAX provides the fragility fracture risk in the next 10 years. FRAX score threshold is currently recognized as reimbursement criteria for DXA acquisition and certain osteoporosis treatments in Switzerland. Further, Swiss national guidelines recommend its use in treatment decision-making. We aimed to investigate the FRAX performance at predicting the occurrence of incident major osteoporotic fractures (MOF) during 10 y of follow-up.

Methods: 944 Swiss postmenopausal women (mean age 62.7 $\pm$ 7.6 y) from the OsteoLaus cohort were included in this analyses. The participants had FRAX assessed at baseline, had undergone a DXA and had incident and prevalent MOF data at baseline and 4 follow-up visits every 2.5 y, with a total follow-up period of 10 y. T-tests were used to study the difference of FRAX adjusted for clinical risk factors (CRF) and of FRAX adjusted for BMD and TBS between fractured and non-fractured groups. FRAX sensitivity and specificity were assessed for cutoffs of 10%, 20%, and moderate and high risk age-adjusted cutoffs as recommended by the Swiss national guidelines.

Results: The 10-y MOF incidence in the low risk group (FRAXTBS $<$ 10%) was 10%, moderate risk (10 $<$ FRAXTBS $<$ 20%) was 25% and high risk (FRAXTBS $>$ 20%) was 48%; and for FRAXCRF the 10-y MOF incidence was 11.7%, 23% and 29%, respectively. Both FRAXCRF and FRAXTBS were significantly higher in the fractured group. The sensitivity of FRAXTBS cutoff 10% was 66%, specificity was 42%; the sensitivity of FRAXCRF cutoff 20% was 20%, specificity 7.5%. The sensitivity and specificity of the FRAXTBS age-dependent cutoff was 18% and 7%, respectively.

Conclusion: The fully adjusted FRAX model, comprising adjustment for CRF, BMD and TBS performs better in fracture prediction than the only CRF adjusted model. The age- dependent FRAX cutoffs used currently in Switzerland show a low sensitivity and specificity in the 10 years fracture prediction in the OsteoLaus cohort. Further analysis

will study more FRAX performance parameters; and take into account time dependent fracture occurrence and the possible effect of antiosteoporotic treatment use in FRAX performance.

P455
INFLAMMATORY PHENOTYPE OF OSTEOARTHRITIS AND METHOTREXATE

E. Strebkova[1], L. Alekseeva[1], E. Taskina[1], N. Kashevarova[1], E. Sharapova[1], A. Lila[1]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To study the effectiveness of methotrexate in patients with knee osteoarthritis (OA) and synovitis.
Methods: The prospective study included 19 patients (women) with knee OA (criteria of the ACR) I-III X-ray stage (Kellgren-Lawrence), aged 45–75 y (Me 60.0 (54;65) y), with knee pain > 40 mm according to VAS, who needed NSAIDs and clinically pronounced synovitis. Patients received methotrexate 15 mg once a week subcutaneously for 24 weeks. An individual card was filled out for each patient, including anamnesis and clinical examination data, assessment of pain in the knee joints according to VAS, WOMAC, ultrasound data of the knee joint.
Results: Patients had a statically significant decrease in pain according to VAS ($p < 0.05$) and all components of the WOMAC ($p < 0.05$) (Figs. 1-3) against the background of methotrexate therapy. 85.5% of patients responded to therapy according to the OMERACT-OARSI criteria. 10 patients showed a significant decrease in the thickness of the synovial membrane and signs of synovitis ($p < 0.05$) according to knee ultrasound in dynamics against the background of methotrexate therapy. The need for the use of NSAIDs has decreased against the background of methotrexate therapy. No serious adverse events have been reported.

Figure 1. Dynamics of knee pain by WOMAC

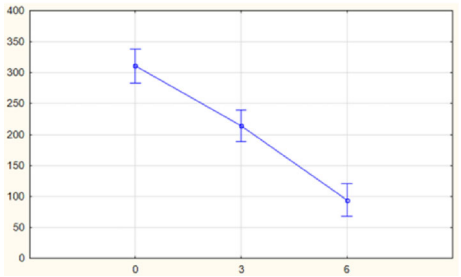


Figure 2. Dynamics of knee stiffness by WOMAC

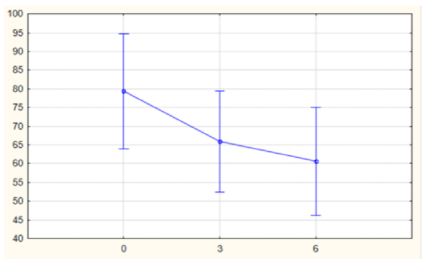
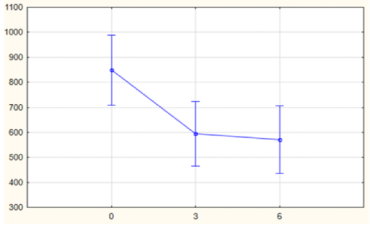


Figure 3. Dynamics of knee functional insufficiency by WOMAC



Conclusion: Methotrexate has a good clinical effect and a satisfactory safety profile in the inflammatory phenotype of knee OA.

P456
COMPARATIVE LABORATORY AND INSTRUMENTAL CHARACTERISTICS OF METABOLIC AND OSTEOPOROTIC PHENOTYPES OF KNEE OSTEOARTHRITIS

E. Strebkova[1], N. Kashevarova[1], L. Alekseeva[1], E. Taskina[1], N. Savushkina[1], E. Sharapova[1], K. Mikhailov[1], A. Khalmetova[1], A. Lila[1]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Comparative analysis of laboratory and instrumental indicators of metabolic (MetOA) and osteoporotic (OPOA) phenotypes of knee osteoarthritis (OA).
Methods: The study included 195 patients with MetOA (metabolic syndrome and/or type 2 diabetes mellitus) and 176 with OPOA (with reduced BMD: the presence of osteoporosis or osteopenia in the axial skeleton), with a reliable diagnosis of knee OA (criteria of the ACR) of stage I-III according to Kellgren-Lawrence.
Results: The patients of both groups did not differ in age and duration of the disease. During laboratory examination, patients with MetOA had statistically significantly high levels of inflammatory biomarkers (CRP, leptin), carbohydrate (glucose, insulin) and lipid metabolism (triglycerides), which indicates the role of low-level inflammation and metabolic disorders in this phenotype. According to the X-ray of the knee MetOA there was a greater narrowing of the medial articular gap, large lateral osteophytes of the femur and medial osteophytes of the tibia were detected; according to ultrasound data, there is a large thickness of the synovial membrane, compared with patients with OPOA. Osteitis was also more common in MetOA in the medial femur (MRI): (RR = 1.72, 95% CI 1.34–2.21, p = 0.0002), in the central tibia (RR = 2.85 95% CI 2.30–3.53, p = 0.0001). The results obtained confirm a more severe course in patients with MetOA (Table 1).

Table 1. Laboratory and instrumental indicators of patients with MF and OPF OA

Parameter	MetOA n=195	OPOA n=176	p
CRP, mg/l, Me	2,8 [1,5; 5,0]	1,1 [0,5; 1,9]	<0,001
Leptin, ng/ml,	45,2 [33,9; 73,0]	18,6 [12,9; 36,5]	<0,001
Osteitis in the medial part of the femur,%	33,3	11,2	<0,001
Osteitis in the central parts of the tibia,%	43,5	0	<0,001

Conclusion: In patients with MetOA, is noted that the course of OA is more severe than that of OPOA: worse indicators during instrumental and laboratory examinations. In OPOA, there are significantly smaller structural changes and lower rates of inflammatory response and metabolic disorders compared with MetOA.

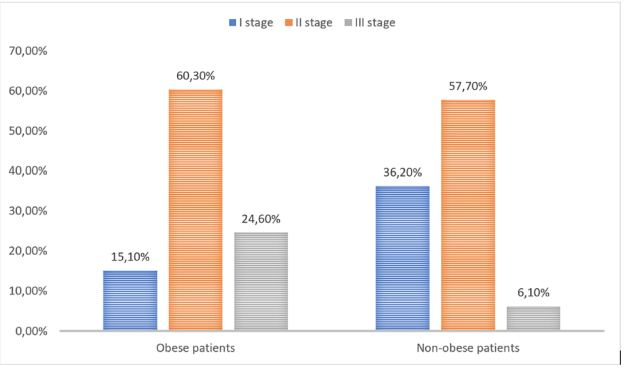
P457
EFFECT OF OBESITY ON STRUCTURAL CHANGES IN KNEE JOINTS IN OSTEOARTHRITIS

E. Strebkova[1], L. Alekseeva[1], E. Taskina[1], N. Kashevarova[1], N. Savushkina[1], E. Sharapova[1], K. Mikhailov[1], A. Khalmetova[1], D. Kudinsky[1], O. Alekseeva[1], A. Lila[1], T. Raskina[2], J. Averkieva[2], E. Usova[2], I. Vinogradova[3], O. Salnikova[3], A. Markelova[3]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, [2]Kemerovo State Medical Univ., Kemerovo, [3]Ulyanovsk Regional Clinical Hospital No. 1, Ulyanovsk, Russia

Objective: To evaluate the effect of obesity on structural changes in knee joints in patients with osteoarthritis (OA).
Methods: The study included 495 patients aged 40–75 years with a reliable diagnosis of knee OA (ACR) of stage I–III (Kellgren–Lawrence) who signed an informed consent. The average age of the patients was 60.5 ± 8.33 y (from 40–75), the duration of the disease was 7 y (3–14).
Results: Obesity (BMI > 30 kg/m^2) was detected in 244 individuals (49.3%). Obese patients were more likely to have more severe stages of OA (Graph 1): stage III—24.6 vs. 6.1% (RR = 0.2, 95% CI 0.1–0.4, $p < 0.0001$); smaller sizes of the medial articular fissure, more massive osteophytes of the femur and tibia, more pronounced hypertrophy of the synovial membrane and tenosynovitis ($p < 0.05$ for all parameters). Osteitis (RR = 0.2, 95% CI 0.06–0.87, p = 0.03) and subchondral cysts (RR = 0.16, 95% CI 0.03–0.9, p = 0.04) in the medial tibia were more often detected in obese patients. Spearman correlation analysis ($p < 0.05$) confirmed the relationship between high BMI and osteitis in the medial tibia (r = 0.31), subchondral cysts in the medial tibia (r = 0.27), X-ray stages (r = 0.31), the size of osteophytes of the femur and tibia, hypertrophy of the synovial membrane (r = 0.27) and tenosynovitis (r = 0.22). Inverse relationships with the size of the medial articular gap (r = -0.21) were revealed.

Graph 1. Radiological stages of OA in obese and normal body weight individuals



Conclusion: Obese patients have more severe structural changes of the knee joints according to instrumental examinations. Direct links between obesity and osteitis, subchondral cysts, and osteophytosis have been found. Associations of high BMI and smaller sizes of the medial articular gap were revealed. The results of our work indicate the important role of obesity as a predictor of a more severe course of OA, which requires the development of algorithms for the treatment of patients with obesity and knee OA.

P458
INITIAL CLINICAL INSIGHTS: SELECTIVE DNA/NETS APHERESIS IN THE MANAGEMENT OF SYSTEMIC LUPUS ERYTHEMATOSUS

E. A. Aseeva[1], E. V. Nikolaeva[1], S. K. Solovyov[1], N. Y. U. Nikishina[1], E. T. Abdullin[2], T. M. Reshetnyak[1], E. G. Zotkin[1], N. S. Pokrovsky[3], A. M. Lila[1]

[1]Federal State Budgetary Institution Research Institute of Rheumatology named after V.A. Nasonova, [2]Moscow State Univ. named after. M.V. Lomonosov, [3]Federal State Budgetary Institution National Medical Research Center of Cardiology named after Academician E.I. Chazov, Ministry of Health of the Russian Federation, Moscow, Russia

Objective: Elevated levels of circulating cell-free DNA (cfDNA) and neutrophil extracellular traps (NETs) are associated with systemic lupus erythematosus (SLE) and may represent a new potential therapeutic targets. The first case report of the treatment of SLE using a new adsorption column for selective apheresis of cfDNA/NET will be reported. Our aim was evaluation of the efficacy and safety of therapeutic apheresis using adsorption column for selective cfDNA/NETs apheresis in patients with systemic lupus erythematosus (SLE).
Methods: Patient K., 56 years old with SLE (according to SLICC criteria, 2012) underwent three sessions of selective cfDNA/NETs apheresis a one-day interval between procedures, standard therapy with 6-methylprednisolone at a dose of 16 mg/d per/os was prescribed. Therapeutic apheresis procedures were carried out using new medical device for selective cfDNA/NETs apheresis to stop the exacerbation of the disease. The volume of treated plasma per one procedure was approximately 2 volumes of circulating plasma. General blood tests, biochemical parameters, immunological markers and disease activity (SLEDAI-2 K index) were assessed before and after the course of treatment.
Results: Significant positive dynamics were noted during the therapy: the SLEDAI-2 K index decreased from 32 (vasculitis, urinary casts, hematuria, proteinuria, rashes, low complement, increased antibodies to dsDNA, fever, leukopenia) to 12 (hematuria, pyuria, low complement, an increase in the level of antibodies to dsDNA) points, normalization of blood leukocyte levels, positive dynamics of renal function and decrease in immunological activity of the disease. The level of antibodies to dsDNA, to Sm, to C1q, LaSSB and anti-centromere antibodies decreased and increase in the C4 fraction of complement. There were no adverse reactions or complications during or after the procedure.
Conclusion: The first results with selective cfDNA/NETs apheresis column demonstrated a significant clinical and laboratory results in the treatment of severe exacerbation of SLE.

P459
COMPUTER-AIDED MULTI-POINT ANALYSIS OF TIBIOFEMORAL JOINT SPACES IN AN ANTEROMEDIAL OSTEOARTHRITIS (AMOA) KNEE MODEL: A PERSONALIZED APPROACH TO JOINT SPACE MAPPING

E. Tahir[1], Z. Zhi[1], D. G. Alemayehu[1], H. D. Wang[1], X. Ma[1]

[1]Dept. of Orthopedics, First Affiliated Hospital of Xi'an Jiaotong Univ., Xi'an, China

Objective: To introduce an efficient and easy-to-use CT-based 3D Joint Space Mapping (3D-JSM) protocol for quantifying multiple joint space widths (JSWs) within the tibiofemoral compartments relevant to disease progression.

Methods: Geometric 3D models of bones and tibiofemoral cartilages (TFC) were generated using data from CT and 3D MRI scans of a 62-year-old female with left knee AMOA. To extract 3D contours of the femorotibial joint space (FTJS), we employed multiplanar CT image analysis, region-of-interest (ROI) selection, joint space margin delineation, and surface patch extraction techniques using 3D modeling software. The extracted joint space curvatures were interpolated with 182-point nodes to establish a multi-point JSW construct. Point-to-point distances were then automatically computed for evaluating changes in width across the joint space. Multi-point JSW CT measurements for the medial compartment within the ROI were also compared with MRI-derived cartilage thickness measurements from the same patient.
Results: The curvatures of the 3D medial and lateral FTJS constructs were well-matched with multiplanar images and 3D bone model margins. There were 91 JSW values generated for each compartment (medial and lateral). The mean JSW in the medial compartment was 3.83 ± 2.65 mm. These results were very similar to the combined mean thickness of the TFCs derived from MRI (3.56 ± 2.06 mm). The lowest point-to-point distance was 1.478 mm (minimum JSW). Out of the 91 JSWs mapped on the medial side, a total of 8 JSWs were found to be less than 2-mm. These were all located along the anteromedial aspect and measured 1.478 mm, 1.622 mm, 1.713 mm, 1.803 mm, 1.834 mm, 1.853 mm, 1.868 mm and 1.887 mm respectively. In contrast, the mean JSW in the lateral compartment was 6.28 ± 2.50 mm, while the lowest point-to-point distance was 3.458 mm. From posterior to anterior, a trend of decreasing JSW was observed along the curvature of the joint space construct, more prominent on the medial side.
Conclusion: Multi-point analysis of JSW in accurate 3D patient-specific constructs can be useful for understanding morphological characteristics and local tissue environments in AMOA patients. As a result, more personalized treatment options could be designed, improving both clinical outcomes and procedural efficiency.

P460
MINIMALLY INVASIVE-PERCUTANEOUS SURGERY FOR TREATMENT OF MILD-TO-SEVERE GLUTEAL MUSCLE CONTRACTURE: A LESS-IS-MORE APPROACH

E. Tahir[1], Z. Zhi[1], D. G. Alemayehu[1], H. Wang[1], X. Ma[1]

[1]Dept. of Orthopedics, First Affiliated Hospital of Xi'an Jiaotong Univ., Xi'an, China

Objective: The aim of this study was to introduce a minimally invasive-percutaneous technique to achieve full-thickness fibrotic band release and to assess the clinical efficacy of this method.
Methods: 112 gluteal muscle contracture (GMC) patients (60 males, 52 females) aged between 16–44 y (mean age: 27.96 ± 4.67 y) were consecutively treated with minimally invasive-percutaneous surgery (MIPS). These were all bilateral cases, totaling 224 hips. As an adjunct to surgical planning, a dynamic musculoskeletal ultrasound (D-MSKUS) imaging protocol was implemented preoperatively. The safe zone and the optimal access points were established intraoperatively using an accurate and reproducible MIPS technique. The immediate functional improvement after fibrotic band division was assessed intraoperatively. Postoperative outcomes and complications were documented, and patient satisfaction was assessed through questionnaire. The clinical efficacy of MIPS was assessed using a standard GMC outcome evaluation scale at final follow-up.
Results: 224 hips were categorized as mild (42); slightly moderate (61); moderate (46); and severe (75) contractures. Two cases had bilateral recurrences following failed primary open surgery; both cases were treated with MIPS. The effective rate of full-thickness fibrotic band division with MIPS was 100% in all 224 hips. A maximum of three percutaneous access points were used, each only 3-mm. Mean operative time was 7.21 ± 3.78 min (unilateral). Compared to preoperative condition, there was significant functional improvement intraoperatively. Postoperatively, patients could actively overlap their legs whilst sitting and squat with their knees pressed together. Postoperative hematomas were reported in six cases; all were cured conservatively within three weeks. At the final follow-up, 165 hips had excellent results, 49 had good results, and 10 had fair results; the mean follow-up period was 2.5 y. No recurrences, infections, neurovascular injuries, or other long-term complications occurred. All patients were satisfied with the results of the surgery.
Conclusion: These findings suggest that MIPS can effectively cure mild-to-severe contractures in patients with GMC. The hallmark of this method is that it uses only two-to-three 3-mm percutaneous incisions to divide IMFBs across their full-thickness. By preserving gluteal muscle integrity, it significantly reduces surgical trauma, improves quality of life postoperatively, and facilitates faster functional recovery.

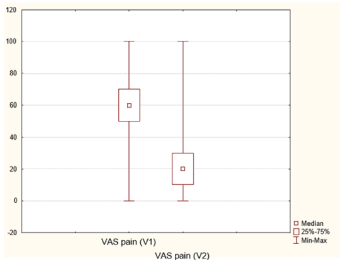
P461
EFFICACY OF BIOACTIVE CONCENTRATE OF SMALL MARINE FISH IN PATIENTS WITH CHRONIC LOW BACK PAIN

E. Taskina[1], A. Lila[1], L. Alekseeva[1], E. Strebkova[1], N. Kashevarova[1]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To study the efficacy of SYSADOA (bioactive concentrate of small marine fish (BCSMF) containing chondroitin sulfate, amino acids, peptides, sodium, potassium, calcium, magnesium, iron, copper and zinc ions) in patients with chronic low back pain (LBP) in a large open pilot prospective observational study.
Methods: We enrolled 10,047 patients between 40–75 years of age who had LBP for at least 12 weeks with a pain intensity > 30 mm on visual analogue scale (VAS). The median age was 60 (49–68) y, BMI was 27.9 ± 4.7 kg/m^2. The duration of the study is from 20–31 d, the number of visits is 2: visit 1 (V1)—the beginning of therapy, visit 2 (V2)—within 10 d after the completion of the 1st course of treatment. BCSMF was prescribed 1 ml intramuscular daily No. 20 or 2 ml intramuscular every other day No. 10. The effectiveness of treatment was assessed by the dynamics of pain (VAS), assessment of quality of life according to the EQ-5D and general health status (GHS) according to VAS.
Results: Against the background of one course of the BCSMF there was a significant decrease in pain intensity (V1—60 (50–70) and V2—20 (10–30) mm, $p < 0.0001$, Fig. 1), improvement in the quality of life according to EQ-5D ($p < 0.0001$) and GHS ($p < 0.0001$). The median reduction in pain (VAS) was 66.7%. A good response to therapy (pain reduction by 50% or more, n = 9789) was detected in 73%; pain reduction of less than 40 mm in 87.2% of patients. Older age, high pain intensity, poorer quality of life and concomitant pathology were associated with a lower effect of LBP therapy (pain reduction by less than 50%): coronary heart disease ($p < 0.0001$), chronic heart failure ($p < 0.0001$) and obesity ($p < 0.0001$).

Fig. 1 – Dynamics of muscle pain (on VAS) in patients with chronic low back pain



Conclusion: Although open and uncontrolled, this large pilot community-based study shows dramatic reductions in pain in patients with LBP treated with BCSMF. Taking into account and correcting factors associated with a less pronounced analgesic effect of the drug will improve the effectiveness of OA therapy.

P462
MAIN RISK FACTORS CAUSING PAIN IN EARLY OSTEOARTHRITIS: PRELIMINARY DATA

E. Taskina[1], L. Alekseeva[1], N. Kashevarova[1], E. Strebkova[1], E. Sharapova[1], N. Savushkina[1], O. Alekseeva[1], D. Kudinsky[1], N. Demin[1], A. Lila[1]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To identify the main risk factors associated with pain in early knee osteoarthritis (OA).
Methods: The study included 51 women with early knee OA, according to the criteria of ESCOA, who signed informed consent. The mean age of patients was 49 ± 10.4 y. An individual card was filled out for each patient, including anthropometric parameters, anamnesis, instrumental and clinical examination data. All patients underwent standard X-ray (Kellgren-Lawrence), ultrasound of the knee joints, laboratory examination.
Results: Every third patient (33.3%) had moderate or severe knee pain (≥ 40 mm according to VAS). Patients were divided into 2 groups, depending on the presence or absence of pain ≥ 40 mm according to VAS. Patients were comparable in age, disease duration. Patients with knee pain had higher BMI, indicators of WOMAC, general assessment of the patient's health status, worse data on the KOOS and DN4 ($p < 0.05$). Knee X–ray revealed larger sizes of osteophytes, knee ultrasound—synovitis (58.8 and 29.4%, OR = 1.9, 95% CI 1.01–3.7, p = 0.05), densitometry—higher values of total hip BMD, laboratory examination—higher values COMP ($p < 0.05$ for all values). Arterial hypertension (AH) (50 and 0%, OR = 11.5, 95% CI 1.6–83.9, p = 0.002), hypercholesterolemia (72.7 and 34.6%, OR = 2.2, 95% CI 1.17–4.15, p = 0.05) and metabolic syndrome (64.3 and 9.5%, OR = 6.75, 95% CI 1.7–26.7, p = 0.001) were in the presence of knee pain. The Spearman correlation analysis confirmed positive associations ($p < 0.05$ for all values) between the intensity of knee pain and all these factors. In the discriminant analysis, it was found that significant risk factors for the development of pain in early knee OA are: synovitis (clinically detectable), osteophytes (ultrasound data) and AH.
Conclusion: In a prospective study using a complex of clinical, laboratory and instrumental methods, it was shown that knee pain in early OA is caused by synovitis, the presence of osteophytes and AH. The identified risk factors should serve as a basis for the creation of individual targeted preventive and curative measures.

P463
CHANGES IN MORPHOMETRY OF OSTEOCHONDRAL UNIT IN PATIENTS WITH OSTEOARTHRITIS UNDERGOING CORRECTIVE OSTEOTOMY WITH PRP OR SVF POST-TREATMENTS DURING FOLLOW-UP

E. Tchetina[1], A. Prizov[2], A. Volkov[3]

[1]Nasonova Research Institute of Rheumatology, [2]Peoples Friendship Univ. of Russia, [3]Priorov National Medical Research Center of Traumatology and Orthopaedics, Moscow, Russia

Objective: To examine the long-term structural changes in the osteochondral unit in 20 patients with knee osteoarthritis (OA) undergoing high tibial osteotomy (HTO) with platelet-rich plasma (PRP) or stromal vascular fraction (SVF) post-treatments.
Methods: Six weeks after surgery the knees of 10 patients were injected with autologous PRP (PRP subgroup) while another 10 patients were injected with autologous SVF (SVF subgroup) and monitored during 1.5 years. Histological material containing bone and cartilage (2 mm in diameter and 2 cm long) was withdrawn at tibial and femoral sites during surgery and 1.5 y after HTO. Morphometric analyses of bone tissues were carried out using the MegaMorf12 software.
Results: Our analyses demonstrated an increase in articular cartilage height in case of both post-treatments and at both sites that can be considered as a positive outcome. Significant positive changes in the architecture of the subchondral and trabecular bones were also observed; however, SVF post-injection demonstrated higher reparative capacity related to bone volume, subchondral bone height, trabecular bone volume, and trabeculae parameters such as intertrabecular space.
Conclusion: The extent of correction obtained with HTO surgery in combination with PRP and SVF post-treatments resulted in significant improvements both at knee articular cartilage and at bone architecture in patients with OA. However, higher regenerative potential of SVF post-treatment was also noted. Our results might further improve treatment methods that facilitate better clinical outcomes of HTO therapy for patients with OA.
Acknowledgment: This study was funded by Russian Ministry of Education and Science (Project no. 1021062512064-0).

P464
POST-SURGERY PAIN DEVELOPMENT IS ASSOCIATED WITH PREOPERATIVE DISTURBANCES IN FATTY ACID TRANSPORT AND METABOLISM IN PERIPHERAL BLOOD MONONUCLEAR CELLS OF PATIENTS WITH END-STAGE KNEE OSTEOARTHRITIS

E. Tchetina[1], G. Markova[1], K. Glemba[1], M. Makarov[1]

[1]Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To reveal the pre-operative metabolic differences in fatty acid metabolism in patients with knee osteoarthritis (KOA) associated with post-surgery pain development aiming to find intrinsic causes of chronic post-operative pain.
Methods: Peripheral blood of 26 healthy volunteers (55 ± 8.3 y) and 50 end-stage KOA patients (56.5 ± 8.9 y) undergoing knee joint replacement surgery was examined prior to surgery and 6 months' post-surgery. Nociceptive pain was assessed using VAS index whereas neuropathic pain, using DN4 and PainDETECT questionnaires prior to surgery. Functional activity was assessed by WOMAC. Pain indices after surgery according to VAS of 30% and higher were considered. Protein levels were quantified by ELISA. Total RNA was isolated from whole blood. Relative gene expression examination was performed with quantitative real-time RT-PCR prior to surgery.

Results: Out of 50 patients, pain complaints were obtained from 17 patients after 6 months post-surgery. No difference in the clinical pain-related and functional indices in the examined subsets of patients was observed at baseline. Prior to surgery the majority of the examined genes were significantly upregulated in all the examined patients compared to healthy controls. In contrast, FASN gene expression was comparable in KOA patients and healthy individuals. Patients who developed postoperative pain demonstrated significantly higher expression of ACLY and CPT1A genes compared to those who were satisfied with the results of surgery. At the same time, no differences were found in the expression of ACC1, MLYCD and FASN in both in both examined subsets was noted.
Conclusion: Postoperative pain development is associated with an increased transport of fatty acids into mitochondria, caused by overexpression of the CPT1A gene, as well as by accumulation of acetyl-CoA due to high expression of the ACLY gene, which can be assessed in the peripheral blood of patients with KOA before surgery.
Acknowledgment: This study was funded by Russian Ministry of Education and Science (Project no. 1021062512064-0).

P465
ROLE OF CLINICAL PARAMETERS AND CATHEPSIN S GENE EXPRESSION IN PREDICTING THE DEVELOPMENT OF POSTOPERATIVE PAIN IN PATIENTS WITH OSTEOARTHRITIS OF THE HIP JOINT

E. Tchetina[1], G. Markova[1], K. Glemba[1], M. Makarov[1]

[1]Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To evaluate the significance of clinical traits and expression of the pain-related gene—cathepsin S and pro-inflammatory cytokines IL-1β, TNFα, and cyclooxygenase (COX)2 in the peripheral blood in prognosis of postoperative pain development in patients with osteoarthritis (OA) of the hip joint before arthroplasty.
Methods: The peripheral blood of 31 end-stage patients with OA (mean age 61.3 ± 9.8 y), before hip joint replacement, and 26 healthy volunteers were studied. Patients with OA were examined before and 6 months after surgery. Nociceptive pain was assessed using VAS index whereas neuropathic pain, using DN4 and PainDETECT questionnaires prior to surgery. Functional activity was assessed by WOMAC. Pain indices after surgery according to VAS of 30% and higher were considered. Protein levels were quantified by ELISA. Total RNA was isolated from whole blood. Relative gene expression examination was performed with quantitative real-time RT-PCR prior to surgery.
Results: Out of 31 patients, pain complaints were obtained from 12 patients (38.7%) after six months post-surgery. Preoperatively, gene expression of cathepsin S, IL-1β, TNFα, and COX2 was significantly higher in both patient subgroups compared with healthy controls. Moreover, neuropathic pain according to the DN4 questionnaire and the expression of the cathepsin S gene were significantly higher in patients who were dissatisfied with the outcome of arthroplasty and who retained pain syndrome, compared with the other examined patients. However, there was no significant differences in the expression of pro-inflammatory cytokine genes between the examined subgroups before arthroplasty.
Conclusion: The development of postoperative pain in patients with hip OA may be associated with impaired central sensitization while increased expression of the cathepsin S gene in the peripheral blood before surgery may serve as a prognostic biomarker of chronic pain persistence.
Acknowledgment: This study was funded by Russian Ministry of Education and Science (Project no. 1021062512064-0).

P466
BONE MINERAL DENSITY IN POSTMENOPAUSAL WOMEN WITH RHEUMATOID ARTHRITIS

E. V. Brutskaya-Stempkovskaya[1], V. V. Prybylskaya[2], A. A. Trotskaya[2], N. A. Vasilyeva[3], M. L. Snitich[1], V. A. Sirik[1], Y. V. Dydyshko[1]

[1]Belarusian State Medical Univ., [2]Minsk Consulting and Diagnostic Center, [3]Republican Center for Medical Rehabilitation and balneotherapy, Minsk, Belarus

Objective: BMD decreasing in patients with rheumatoid arthritis is an immune-mediated secondary osteopathy. The development of osteoporosis is one of the significant complications of rheumatoid arthritis (RA), associated with the occurrence of low-traumatic fractures and an unfavorable course of the disease. Female gender, age over 50 y, and glucocorticosteroid therapy are risk factors for secondary osteoporosis in patients with RA.
Methods: A cross-sectional controlled study of 48 postmenopausal women with RA was conducted to assess BMD in postmenopausal women with RA. A comparison group included 25 postmenopausal women without RA. Exclusion criteria: age over 75 years, patients with a history of spinal injuries and diseases of the musculoskeletal system of functional classes III–IV, a decrease in GFR less than 30 ml/min, with concomitant diseases and conditions associated with a decrease in BMD. Examination: biochemical blood tests, DXA.
Results: Patients of both groups were comparable with anthropometric, anamnestic, laboratory data: glucose, cholesterol, TG, HDL, VLDL, AST, ALT, creatinine, total protein, calcium in blood serum ($p > 0.05$). The average age of the patients in the main group was 63.2 ± 6.77 y: in the control group—61.9 ± 5.23 y, U = 178.5, p = 0.165. Significantly decreasing BMD detected in patients of the main group compared with patients of the control group in the lumbar spine: T-score L2 (− 2.4 (− 2.8 to − 1.0) vs. − 1.1 (− 1.9 to − 0.2), U = 116.0, p = 0.003), T-score L3 (− 1.4 (− 2.0 to − 0.8) vs. − 0.1 (− 0.9 to 1.1) and in the proximal femur: T-score total hip L (− 1.0 (− 1.9 to 0.7) vs. − 0.1 (− 0.9 to 0.8), U = 113.5, p = 0.002), total hip R (− 1.1 (− 1.9 to − 0.8) vs. − 0.2 (− 0.9 to 0.5), U = 99.5, $p < 0.001$).
Conclusion: BMD decreased in the lumbar spine and proximal femur in postmenopausal women with rheumatoid arthritis compared postmenopausal women without rheumatoid arthritis.

P467
ASSOCIATION OF CHEMERIN WITH RHEUMATOID ARTHRITIS COMORBIDITY

E. V. Papichev[1], L. E. Sivordova[1], Y. U. R. Akhverdyan[1], Y. U. V. Polyakova[1], B. V. Zavodovsky[1]

[1]FSBI "RICER named after A.B. Zborovsky", Volgograd, Russia

Objective: To study the association between serum chemerin levels with rheumatoid arthritis comorbidity.
Methods: We enrolled 88 women with RA in our study. Standard clinical and laboratory examination was performed. Serum levels of chemerin, high-sensitive C-reactive protein (hsCRP), anti-citrullinated protein antibodies (ACPA), insulin and C-peptide levels were determined using ELISA. Homeostatic model assessment for insulin resistance (HOMA-IR) was calculated. Statistical analysis was performed using conventional methods with a software package Statistica 10.0.
Results: Median chemerin concentration was 463.5 [366–576.5] ng/ml. Chemerin concentration correlated with the age ($\rho = 0.232$; $p = 0.030$), weight ($\rho = 0.254$; $p = 0.017$) and BMI ($\rho = 0.212$; $p = 0.047$), but wasn't associated with serum levels of rheumatoid

factor, ACPA and DAS28. We observed positive correlation between serum chemerin levels with the number of tender joints (NTJ) from 28-joint counts ($\rho = 0.213$; $p = 0.046$) and hsCRP ($\rho = 0.273$; $p = 0.010$), and slightly above statistical significance with the number of swollen joints ($\rho = 0.210$; $p = 0.051$). Patients with type 2 diabetes mellitus (DM2) had higher chemerin concentration (598.0 vs. 479.5 ng/ml, U = 134.5; $p = 0.007$) and patients with cholecystectomy in anamnesis had lower (359.0 vs. 479.0 ng/ml, U = 123.5; $p = 0.043$). However, serum chemerin levels were not associated with blood glucose ($\rho = -0.02$; $p = 0.871$), serum insulin ($\rho = -0.10$; $p = 0.369$) and HOMA-IR ($\rho = -0.10$; $p = 0.353$), but were approaching statistical significance with C-peptide ($\rho = -0.20$; $p = 0.058$). Serum chemerin levels correlated with systolic and diastolic blood pressure (BP) ($\rho = -0.41$; $p < 0.001$ and $\rho = -0.27$; $p = 0.028$, respectively).

Conclusion: Chemerin concentration in women with RA correlates with age, weight, BMI, NTJ and hsCRP. Higher levels of chemerin were observed in patients with DM2 comorbidity and lower in patients comorbid with cholecystectomy in anamnesis. Chemerin levels correlates negatively with a systolic and diastolic BP.

P468
EFFECT OF SERUM ALBUMIN AND HEALTH-RELATED QUALITY OF LIFE ON POSTOPERATIVE RECOVERY IN ELDERLY HIP FRACTURE PATIENTS

W. Sirichativapee[1], E. Vanitcharoenkul[2], P. Chotiyarnwong[2], A. Unnanuntana[2]

[1]Orthopaedics Dept., Khon Kaen Univ., Khon Kaen, [2]Dept. of Orthopaedic Surgery, Faculty of Medicine Siriraj Hospital, Mahidol, Bangkok, Thailand

Objective: Over the last decade, global aging has surged, bringing increased age-related conditions. Osteoporosis, a precursor to fragility fractures, significantly impacts morbidity and mortality. Despite standard treatments, short-term studies reveal poor post-hip fracture outcomes, affecting mobility and quality of life. Malnutrition, often overlooked, affects 4% to 39.4% of elderly hip fracture patients, hindering recovery. This study aimed to establish the correlation between preoperative serum albumin levels and postoperative functional recovery in elderly hip fracture patients.

Methods: A retrospective analysis utilized data from the Fracture Liaison Service registry at a university hospital between 2016–2021. Serum albumin levels, measured upon admission, defined hypoalbuminemia as total albumin < 3.5 g/dL. Functional outcomes were assessed using Barthel index and EQ-VAS before discharge, at 3 months, and 1 year postoperatively. Multivariable logistic regression identified risk factors for poor Barthel index scores (< 60) at 1 y after surgery.

Results: A total of 1086 patients with mean age of 79.9 y and 75.8% were female, hypoalbuminemia prevalence in elderly patients with fragility hip fracture was 28.9%. Over a 1-y follow-up, all functional outcomes significantly improved compared to baseline. However, in hypoalbuminemia cases, EQ-VAS notably improved only within the initial 3 months post-surgery. Further analysis revealed low serum albumin (OR = 1.68, 95% CI 1.19–2.39; $p = 0.003$) and Charlson Comorbidity Index (CCI) ≥ 5 (OR = 3.80, 95% CI 1.49–9.70; $p = 0.005$) as factors associated with poor Barthel index scores. The risk of unfavorable functional outcomes was particularly pronounced with albumin levels below 3.8 g/dL (Youden index).

Conclusion: Our study confirms that preoperative serum albumin levels are a significant predictor of poor Barthel index scores one year after hip fracture surgery. Elevated CCI is also identified as a factor contributing to unfavorable functional outcomes. Addressing malnutrition, specifically correctable risk factors like hypoalbuminemia, in preoperative care is crucial for optimizing postoperative recovery and improving overall quality of life in elderly hip fracture patients.

P469
DYSLIPIDEMIA AND ITS RELATION WITH THE ACTIVITY OF THE DISEASE IN PATIENTS WITH SLE

E. Xherahu[1], T. Backa[2]

[1]Memorial Regional Hospital, Intern Dept., Rheumatology Clinic, [2]Mother Theresa Univ. Hospital Center, Tirana, Albania

Objective: To evaluate the association of dyslipidemia with disease activity in patients with SLE.

Methods: The study included 80 patients diagnosed with SLE hospitalized in the rheumatology service at the "Mother Teresa" University Hospital, Tirana during the period 2019–2021. All these patients met at least 4 of the 11 classification criteria for SLE, revised from the American College of Rheumatology (1997). Patients were divided into two different groups according to the SLEDAI-2k score, in the group of patients with SLE with low activity and with high activity. Dyslipidemia was defined as the presence of at least one of the following criteria: total CHOL $\geq$ 240 mg/dl, TG $\geq$ 180 mg/dl or combined hyperlipidemia. All patients underwent clinical evaluation and laboratory examination data were recorded on the lipid profile and immunological.

Results: Out of 80 patients (95.0% female), 59 patients (70% female) resulted with high activity SLE, SLEDAI-2k $\geq$ 6. Dyslipidemia was present in 45 patients (56.2%). In patients with high activity, hypercholesterolemia was in 23 patients (23.8%), and hypertriglyceridemia in patients with 29 patients (36.2%). In univariable logistic regression, dyslipidemia was associated with high disease activity index SLEDAI-2k (OR 6.00, 95% CI 1.90–18.86, $p < 0.002$). After further standardization for other risk factors for SLEDAI-2k, in multivariable logistic regressions, the association was significant (OR 12.75, 95% CI 2.44–66.42, $p < 0.02$).

Table 1

Independent predictors of SLEDAI-2k in univariable and multivariable logistic regression

	Univariable Logistic Regression			Multivariable Logistic Regression		
Variable	OR	95%CI	p value	OR	95%CI	p value
Age	0.99	0.96 – 1.03	0.94	0.97	0.91-1.03	0.46
Duration of disease	0.70	0.24- 2.01	0.51	1.09	0.95 -1.26	0.18
AntiDS-DNA	3.28	1.13-9.48	0.02	8.42	1.804-39.35	0.02
Hypokomplementemia	2.85	0.96-8.42	0.06	2.78	0.73-10.63	0.13
Proteinuria 24h	3.55	0.74-17.01	0.11	2.19	0.59-8.14	0.24
Dyslipidemia	6.00	1.90-18.86	0.002	12.75	2.44-66.42	0.02

Conclusion: Dyslipidemia was prevalent in female SLE patients, and was shown to be significantly associated with high disease activity. High levels of total Chol and TG in active SLE patients are considered as independent risk factors for premature atherosclerosis in these patients. Dyslipidemia as well as high disease activity increase the risk for atherosclerosis in patients with SLE. Dyslipidemia is an independent and modifiable risk factor of atherosclerosis.

P470
RISK FACTORS FOR RECURRENT FALLS IN A COHORT OF MIDDLE-AGED MEN AND WOMEN

E. Zaballa[1], S. D'Angelo[1], G. Ntani[1], K. Walker-Bone[2], E. Dennison[3]

[1]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK, [2]Monash Centre for Occupational and Environmental Health, Monash Univ., Melbourne, Australia, [3]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK, Southampton, UK

Objective: Falls cause disability, morbidity, and mortality across all ages. The number of falls that led to deaths and disability-adjusted life years steadily increased between 1990–2017, however most literature reporting predictors of falls focuses on people aged 65 and over. Specifically, there is a scarcity of studies evaluating risk factors for falls in community dwelling middle-aged people, thus this study addressed this evidence gap.
Methods: We used data from the Health and Employment After Fifty (HEAF) study, a longitudinal cohort that first recruited participants aged 50–64 in 2013–14. Information on health, finances, lifestyle, and employment was collected annually over 5 y. At each follow-up participants reported whether, in the preceding 12 months, they had experienced any falls. Recurrent fallers, i.e., participants who reported 2 or more falls in at least at two follow-ups were compared with those who did not. Risk factors for being recurrent fallers were explored with Poisson regression models with robust standard errors.
Results. In total 7437 people (54% women), mean age 58.7 ± 4.4 years old were included in the analysis. The prevalence of respondents reporting falling at least twice in the previous year was approximately 5% at each follow-up. While 6979 participants reported less than two falls, 458 (6.7%) were recurrent fallers. Adjusted models showed that recurrent falls were associated with: female sex (RR = 1.3; 95% CI 1.1–1.6), very slow self-reported walking speed (RR = 3.0; 95% CI 2.4–3.8), self-reporting fair or poor health (RR = 2.7 95% CI 2.1–3.4), depressive symptoms (RR = 1.8 95% CI 1.4–2.2), and not being in work (RR = 1.4 95% CI 1.2–1.8).
Conclusion: Recurrent falls are not uncommon in younger people (< 65 y) with several risk factors identified. Recognition of these may allow introduction of strategies to reduce this falls risk, and their sequelae.

P471
INFLUENCE OF WEIGHT STATUS ON BROADBAND ULTRASOUND ATTENUATION MEASURED AT THE CALCANEUS IN A GROUP OF YOUNG WOMEN

E. Zakhem[1], F. Francois[2], W. El Hawly[3], R. Hurdiel[4], T. Pezé[4], G. Zunquin[5], R. El Hage[6]

[1]Dept. of Physical Education, Univ. of Balamand, Kelhat, Deddeh El koura, Lebanon, [2]Dept. of Physical Education, Univ. of Balamand, Kelhat, Chekka, Lebanon, [3]Laboratoire Mouvement, Equilibre, Performance, Santé (MEPS), Université de Pau et des Pays de l'Adour, Campus Montaury, Anglet, France, Batroun, Lebanon, [4]Dept. STAPS, URePSSS-EA 4110, EA448, ULCO, Dunkerque, France, [5]Laboratoire Mouvement, Equilibre, Performance, Santé (MEPS), Université de Pau et des Pays de l'Adour, Campus Montaury, EA 4445, Anglet, Bordeaux, France, [6]Dept. of Physical Education, Univ. of Balamand, Kelhat, Kfarabida, Lebanon

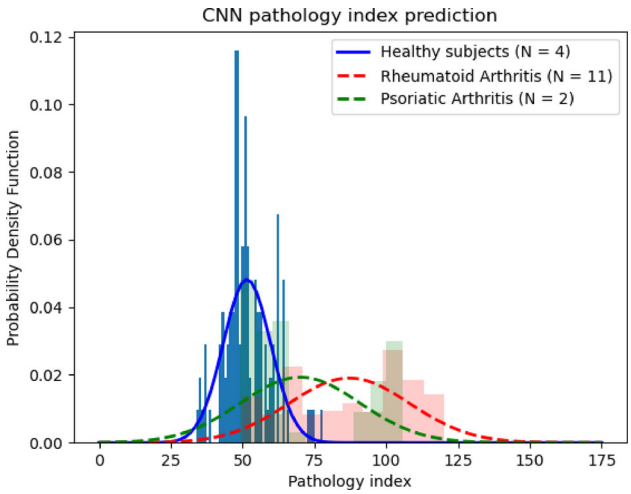
Objective: To investigate the effect of weight status on broadband ultrasound attenuation (BUA) measured at the calcaneus in a group of young women.
Methods: 369 young women [270 normal weight women (BMI < 25 kg/m^2) and 99 overweight women (BMI > 25 kg/m^2)] with an average age of 20.4 y participated in this study. Height, fat mass, lean mass, hip circumference and waist circumference were measured. Validated questionnaires were used to assess physical activity level, sleep quality and daily calcium intake. Broadband ultrasound attenuation (BUA) of the calcaneus was measured using a valid ultrasonometry device (Pegasus Smart Medlink®).
Results: BUA values were significantly higher ($p < 0.001$) in overweight group (76.6 ± 6.6) compared to normal weight group (74.4 ± 5.4).
Conclusion: Being overweight is associated with greater BMD values at the calcaneus level in young women. Therefore, being overweight seems to protect against osteoporotic fractures at the calcaneus in women.

P472
RADIOFREQUENCY ECHOGRAPHIC MULTI-SPECTROMETRY (REMS) FOR THE RECOGNITION OF MUSCULAR-TISSUE ALTERATIONS

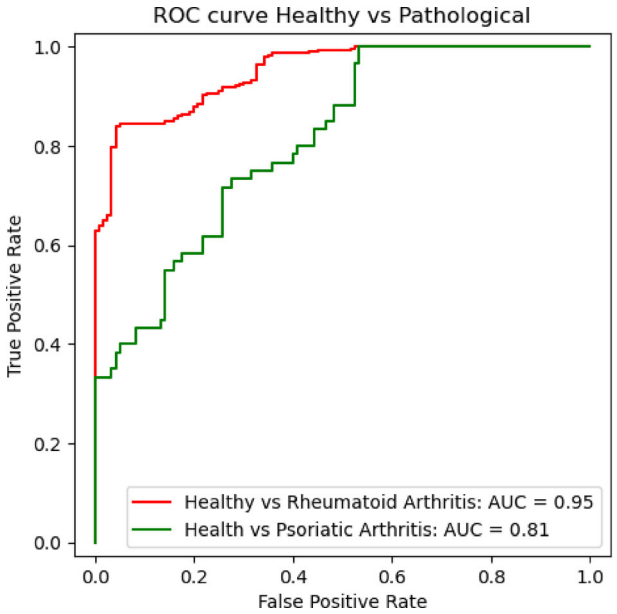
F. A. Lombardi[1], P. Pisani[1], C. Stomaci[2], L. Antelmi[3], E. Casciaro[1], R. Franchini[1], G. Luceri[3], M. Di Paola[1], F. Conversano[1], S. Casciaro[1]

[1]Institute of Clinical Physiology, National Research Council, [2]Dept. of Biological and Environmental Sciences and Technologies, Univ. of Salento, [3]R&D Dept., Echolight S.p.a., Lecce, Italy

Objective: The term "primary sarcopenia" was initially used to characterize the age-related loss of muscle mass in the elderly people. Sarcopenia has since been investigated in many clinical contexts as "secondary sarcopenia", identifying three primary pathogenic mechanisms: inflammatory response (e.g. rheumatoid arthritis (RA) and psoriatic arthritis (PA), etc.), malnutrition (e.g. malabsorptive conditions, etc.), and reduced physical activity (e.g. immobility/bed rest, etc.). Nowadays, it's important to note that ultrasound (US) techniques appear to have a strong position in this context. The ability of US to examine numerous aspects of muscle change makes it potentially helpful in the diagnostic work-up of sarcopenia. This study aims to use REMS technology to assess the pathological changes in muscular-tissue, specifically those of RA and PA subjects respect to healthy controls (HC).
Methods: A total of 17 subjects (4 HC, 11 with RA and 2 with PA) were enrolled and underwent a REMS acquisition of upper limb. The patient was acquired in a supine position with the linear probe placed transversely at the proximal third of the forearm, between the styloid process and the radius head. A novel dedicated pathology index (PI) based on the results of a classification algorithm, previously tuned on the REMS data of healthy subjects, was adopted to measure the PI on the HC, RA, and PA patients.
Results: Fig. 1 shows the histogram of PI measured for each category of subjects (HC, RA, PA), which appears to be well distinct and separated from each other.



In Fig. 2 are shown the results in terms of AUC: the algorithm is able to accurately separate images of HC from those with RA and PA, with AUC of 0.95 and AUC of 0.81 respectively for the HC vs. PA and HC vs. RA comparisons.



Conclusion: REMS is capable to discriminate the images of HC subjects from those with RA and PA. The study demonstrates that REMS technology can provide a dual assessment of muscle and bone health status.

P473
REMS TECHNOLOGY IN THE ASSESSMENT OF BONE HEALTH STATUS IN PATIENTS WITH PROSTATE CANCER

P. Pisani*[1], S. Casciaro*[1], F. R. Contaldo*[2], F. Conversano*[1], M. Di Paola*[1], R. Gifuni*[3], G. Guglielmi*[3], F. A. Lombardi*[1], M. Muratore*[4]

[1]Institute of Clinical Physiology, National Research Council, Lecce, [2]Dept. of Biological and Environmental Sciences and Technologies, Univ. of Salento, Lecce, [3]Dept. of Experimental and Clinical Medicine, Univ. of Foggia, Foggia, [4]ASL-LE, Ospedale Vito Fazzi, Lecce, Italy

Objective: In patients with prostate cancer (PCa), bone health impairment is observed, which is a frequent and harmful consequence of the high bone trophism induced by prostate cancer cells. This is also exacerbated by prolonged treatment with androgen deprivation therapy (ADT), leading to bone matrix loss (with a loss rate of 4.6%/y, up to about 10 times the normal loss) and the consequent increased risk of fractures. It is very important for this patient category to undergo constant monitoring of the bone health status. This study aims to assess the impact of prostate cancer on BMD, thanks to REMS technology (radiofrequency echographic multi-spectrometry) measurement.
Methods: A group of 35 Caucasian men with PCa and a group of healthy controls matched for gender, ethnicity, age and BMI, underwent REMS scans on the lumbar spine (LS). A t-test was then carried out to assess the difference in the values obtained between the two groups.
Results: The means ± standard deviations (SD) of age and BMI for subjects affected by PCa and healthy control are collected in the Table below:

Lumbar Spine	Age ± SD (y)	BMI ± SD (kg/m^2)
PCa	70.5 ± 6.7	25.8 ± 3.6
Healthy control	70.2 ± 6.6	25.5 ±2.5

The patients with PCa showed a significantly reduction of BMD values compared to the healthy control (0.944 ± 0.1 vs. 1.014 ± 0.1 g/cm^2, respectively p = 0.04) with a difference equal to 0.05 ± 0.10 g/cm^2.
Conclusion: The obtained results confirm, as expected, a significantly reduction of lumbar BMD in patients with PCa measured with REMS, due to the negative impact of PCa on bone health. This clinical aspect can be aggravated by the administration of androgenic deprivation therapies, which increase bone turnover and the risk of fractures. REMS technology, thanks to its diagnostic accuracy, reliability and high precision, effectively improves the management of this patient category and allows them to be short-term monitored in the with a constant follow up.

P474
SARCOPENIA KNOWLEDGE AND AWARENESS AMONG HEALTHCARE PROFESSIONALS IN SAUDI ARABIA

F. Alshahrani[1], Y. Alsulaiman[2], S. Alotieschan[3], S. Alammari[4], H. Alarfaj[4], M. Alshehri[5]

[1]King Saud bin Abdulaziz Univ. for Health Sciences, [2]King Fahad Medical City, [3]King Saud Univ. Medical City, [4]King Faisal Specialist Hospital and Research Center, [5]King Abdulaziz medical city, Riyadh, Saudi Arabia

Objective: Sarcopenia is a musculoskeletal disease in which muscle mass, strength, and performance are significantly compromised with age. Sarcopenia most commonly affects elderly and sedentary populations and patients who have comorbidities that affect the musculoskeletal system or impair physical activity (1). Sarcopenia has significant negative consequences personally, socially, medically, and economically, including an increased risk of falls, fractures, frailty, and mortality. Since sarcopenia is a silent and asymptomatic initial stage, Therefore, early assessment and subsequent interventions are important. For this, awareness among healthcare professionals is a prerequisite that requires adequate knowledge regarding the concept, diagnostic criteria, and optimal interventions. (2). We aimed to identify the healthcare professional's awareness and knowledge of sarcopenia in Saudi Arabia.
Methods: Cross-sectional study based on online self-administered questionnaire.
Results: Total of 189 healthcare professionals participated, more than 80% did not received any sarcopenia-related education in the past. Only 12% of participants were able to correctly identify the sarcopenia diagnostic criteria required for diagnosis.
Conclusion: The current study indicated that healthcare professionals had limited knowledge and awareness of sarcopenia, which could influence and impede the early diagnosis and treatment of sarcopenia in practice. Strategies to increase knowledge among healthcare professionals are crucial.
References:

1. Cruz-Jentoft AJ, et al. Age Ageing 2019;48:601
2. Yao XM, et al. J Frailty Aging 2022;11:274

P475
CERVICAL ARTHROSIS' IMPACT IN A TUNISIAN INDUSTRIAL REGION

F. Arfaoui[1], G. Nahdi[1], H. Ajlani[2]

[1]Faculty of Medicine of Tunisia, [2]Rheumatology Dept., Vasminet Hospital, Tunis, Tunisia

Objective: To evaluate the physical and psychological impact caused by cervical arthrosis and whether it affects the work ability of our patients.
Methods: This is a descriptive cross-sectional study carried out over a period of two months in a rheumatology unit including 60 patients, divided into two equal groups of workers and non-workers who have cervical arthrosis. We used the visual analog scale (VAS), the central sensitization inventory (CSI), the SF-12 and the neck disability index (NDI) scores to evaluate the physical and psychological impact and to type the pain in every group. The work ability index (WAI) was calculated in the working patients' group to evaluate the impact of cervicalgia on their work performance.
Results: The ratio-gender was ¼ in the two groups. The mean age in the workers group was 49.2 vs. 64.4 y in the other one. Most of the working patients have a manual job (92%), 68% work in the industry and 71% have been working for more than 10 y. Cervical neuralgia was associated to the cervicalgia in 46% of the working patients, of which 29% were unilateral, while it was more frequent (62%) and bilateral (56%) in the second group. Our patients had at least one other joint affected with osteoarthritis in more than 63% of the cases. The NDI mean score was higher in the workers' group and 42% of them had a complete disability. Central sensitization (CSI $\geq$ 40) was more frequent among the non-workers (89 vs. 83% in the workers' group). The SF-12 mean score was higher in the workers' group (36 vs. 34, and meant 70% of optimal in both groups). There was a significant association between the VAS and the CSI score, and VAS and NDI score in both of the groups; patients with high VAS had moderate to severe central sensitization and severe to complete neck disability. The quality of life (SF-12 score) was associated with the gender; male patients had lower SF-12 scores. Besides, SF-12 and WAI scores were associated with whether or not working patients had a cervical neuralgia or another joint-affection. As for the non-workers' group, the CSI and NDI scores were significantly associated with whether or not they had a cervical neuralgia. SF-12 score, VAS along with CSI and NDI scores were associated with the number of joints affected.
Conclusion: Cervical arthrosis can impact the life quality of patients, whether they were working or not. Thus, an adapted and personalized management is necessary to ease their pain and improve their prognosis.

P476
QUALITY OF LIFE OF TUNISIAN PATIENTS WITH CERVICAL ARTHROSIS

F. Arfaoui[1], G. Nahdi[1], H. Ajlani[2]

[1]Faculty of Medicine of Tunisia, [2]Rheumatology Dept., Vasminet Hospital, Tunis, Tunisia

Objective: To evaluate the type of the pain, the impact caused by cervical arthrosis and to determine the factors associated to a high neck disability.
Methods: This is a descriptive cross-sectional study carried out over a period of two months in a rheumatology unit including 50 patients who have cervical arthrosis. Patients' data was gathered through a pre-established questionnaires associated with an exhaustive examination and a radiological assessment. We used the visual analog scale (VAS) to evaluate the pain and the central sensitization inventory (CSI) to type the pain. The SF-12 and the neck disability index (NDI) were calculated to evaluate the physical and psychological impact of the pain.
Results: Most of our patients were women (80%). The mean age was 57.6 y. 92% of our patients had a manual job and 84% of them have been working for more than 10 y. 68% of the patients have at least one comorbidity. The most prevalent comorbidity was dyslipidaemia (36%). The average duration of progression of the cervicalgia was 1.8 y. 56% of our patients had cervical neuralgia associated to their cervicalgia, of which 46% were bilateral and the C6 topography was the most frequent (61%). 64% of the patients had at least one other joint affected with osteoarthritis. The totality of our patients was under medication: Non-steroidal anti-inflammatory and paracetamol. Physical rehabilitation was prescribed to 58% of them. None of our patients needed corticoid infiltration or surgery. The VAS mean of cervicalgia and radiculalgia were 6.2 and 3.8. respectively. The NDI mean score was 25.6 and 38% of the patients had a complete disability. CSI mean score was 47.92 and 86% had a central sensitization (CSI $\geq$ 40) of which 56% were moderate. The SF12 mean score was 35, which is 70% of optimal. There was a significant association between the VAS and the CSI score, as with the NDI score; patients with high VAS had central sensitization and severe to complete neck disability. Moreover we have found that the CSI and NDI scores were significantly associated with the duration of progression of the cervicalgia and whether or not a cervical neuralgia was associated. SF-12 score, VAS along with CSI and NDI scores were significantly associated with the number of joints affected. The quality of life was associated with the gender; male patients had the lowest SF-12 scores.
Conclusion: Cervical arthrosis can impact patients' quality of life, physically and psychologically, whether it was associated to a several-joint affection or not. Thus, an adapted and personalized management is necessary to ease their pain and improve their prognosis.

P477
VITAMIN D DEFICIENCY IN SUBJECTS WITH CHRONIC INFLAMMATORY DISEASES

F. Bischoff[1], S. Vladeva[2], M. Kovachev[3], E. Simeonov[3], H. Gigov[3]

[1]Rheumatology practice Stara Zagora, Stara Zagora, [2]Trakia Univ., Stara Zagora, [3]Medical Univ.-Pleven, Medical faculty, Pleven, Bulgaria

Objective: Vitamin D deficiency can occur in subjects with chronic diseases due to the known connection between vitamin D status and the activity of chronic inflammatory diseases. The aim of this work is to evaluate the vitamin D status in 63 patients suffering from chronic inflammatory diseases due to its importance for bone metabolism.
Methods: We assessed 63 patients with chronic inflammatory diseases. The mean age of the subjects was 54 $\pm$ 16 y, (range 27–75 y). 51 of the subjects (81%) were female and 12 were male (19%). 39 of 63 patients (61.9%) had rheumatoid arthritis (RA), 17 of 63 (27%) patients had psoriatic arthritis (PsA) and 7 of 63 patients (11.1%) had ankylosing spondylitis (AS). We analyzed the vitamin D_3 values of each subject and compared the mean vitamin D_3 values between the three groups. Low vitamin D_3 value was defined as a rate below 20 ng/ml. Data collection and transfer from the electronic health record was performed with an innovative JAVA tool, developed by Kirilov et al. [1,2].
Results: The mean vitamin D_3 rate was 24.3 $\pm$ 9.1 ng/ml (range 8.2–56.4 ng/ml). 20 of 63 subjects (31.7%) had low vitamin D_3 rate. The group with AS showed the lowest mean vitamin D_3 that was 19.1 $\pm$ 4.3 ng/ml with range 11.1–24.1 ng/ml. The mean vitamin D_3 in the group with RA was 23.9 $\pm$ 9.7 ng/ml. The mean vitamin D_3 in

the group with PsA was 27.5 ± 8.1 ng/ml. The differences in the mean vitamin D_3 values between the three groups were not statistically significant (p = 0.108).
Conclusion: Due to the common vitamin D deficiency in subjects with chronic inflammatory diseases, we recommend vitamin D determination in those patients.
References:

1. Kirilov N, et al. GMS Publishing House 2023; DocAbstr. 66, https://doi.org/10.3205/23gmds105.
2. Kirilov N, Bischoff E. Rheumatology (Bulgaria) 2023;31(Suppl1)

P478
OPTIMIZING MUSCULOSKELETAL HEALTH IN AGING: A SYSTEMATIC REVIEW AND META-ANALYSIS ON THE EFFECTS OF NUTRITIONAL COUNSELING ON PHYSICAL PERFORMANCE AND MUSCLE STRENGTH

F. Buckinx[1], C. Brabant[2], O. Bruyère[2], N. Durieux[3]

[1]WHO Collaborating Centre for Public Health Aspects of Musculoskeletal Health and Ageing. Division of Public Health, Epidemiology and Health Economics, Univ. of Liège, [2]WHO Collaborating Centre for Public Health Aspects of Musculoskeletal Health and Ageing. Division of Public Health, Epidemiology and Health Economics, Univ. of Liège., [3]Research Unit for a Life-Course Perspective on Health and Education-RUCHE, Faculty of Psychology, Speech and Language Therapy and Educational Sciences, Univ. of Liège, Liège, Belgium

Objective: Nutritional counseling is emerging as a crucial component in promoting healthy eating habits and sustainable dietary practices in older adults. Despite its recognised importance, the specific influence of nutritional counseling on the musculoskeletal health in older adults remains uncertain. This study will provide a thorough synthesis of the effects of nutritional counseling compared to two different approaches: no intervention (lifestyle habits maintenance) and nutritional counseling combined with additional strategies such as nutritional supplementation and physical activity. The aim is to provide an understanding of how nutritional counseling impacts physical performance and muscle strength, thereby contributing to the optimisation of musculoskeletal health in the ageing population
Methods: This systematic review follows the JBI guidelines and a pre-defined protocol. It includes randomised and non-randomised controlled trials of people aged 65 years and older who received nutritional counseling and were assessed for physical performance or muscle strength. Extensive searches were conducted in a variety of resources. Study selection, data extraction and synthesis of results are being carried out by two researchers.
Results: Of the 1415 initial references, 1354 were included after removing duplicates. After screening of the titles and abstracts 1272 references were excluded. From the remaining 82 studies, a comprehensive full-text assessment will be conducted. Each retained study will undergo critical appraisal, and its characteristics will be detailed in a table. A narrative synthesis of the results will then be undertaken and a meta-analysis will be performed if there are studies that are sufficiently similar to be meaningfully pooled.
Conclusion: The comprehensive findings will be presented at the WCO-IOF Congress, providing a detailed overview of the impact of dietary advice on the musculoskeletal health of older adults.
Disclosure: FB is supported by the FNRS (Fonds National pour la Recherche Scientifique).

P479
MITIGATING DECONDITIONING IN NURSING HOMES: A FEASIBILITY AND ACCEPTABILITY STUDY OF THE PUSH TOOL (PROMOTING THE AUTONOMY THROUGH EXERCISE IN NURSING HOME)

F. Buckinx[1], V. Libin[2], E. Peyrusqué[3], M. Aubertin-Leheudre[3], O. Bruyère[4]

[1]WHO Collaborating Centre for Public Health Aspects of Musculoskeletal Health and Ageing. Division of Public Health, Epidemiology and Health Economics, Univ. of Liège, Liège, Belgium, [2]Dept. of Sport and Rehabilitation Sciences, Univ. of Liège, Liège, Belgium, [3]Research center of the Univ. Institute of Geriatrics of Montreal, Montréal, Canada, [4]WHO Collaborating Centre for Public Health Aspects of Musculoskeletal Health and Ageing. Division of Public Health, Epidemiology and Health Economics, Univ. of Liège, Liège, Belgium

Objective: To assess the feasibility and acceptability of the PUSH (Promoting the aUtonomy through exerciSe in nursing Home) tool in nursing homes (NH).
Methods: This is a feasibility and acceptability pilot study carried out in 3 NH in the province of Liège, Belgium. The tool, through the establishment of individual abilities, assigns tailor-made exercise programmes to NH residents. To establish individual abilities, validated physical tests for muscle strength, balance and muscle endurance were assessed. Each PUSH programme includes two daily exercises combined with personalized walking or wheelchair distances. Participants were randomized into two modality groups: those who received external motivation (PUSH-EM) twice a week to complete the PUSH programme and those who did not (PUSH-NEM). In addition to socio-demographic characteristics, two acceptability indicators (adherence and satisfaction using a 4-point Likert scale) and two feasibility proxies (perceived difficulty using a 4-point Likert scale and usability using the validated SUS questionnaire) were assessed. The expected values were 80% for adherence and satisfaction, 68/100 for SUS and less than 40% for difficulty.
Results: 55 participants (PUSH-EM: n = 27 vs. PUSH-NEM: n = 28), aged 84.9 ± 7.5 years with 70.9% women and an MMSE score of 27/30 points were enrolled. The groups showed comparable adherence (PUSH-EM: 62% vs. PUSH-NEM: 63.2%; p = 0.82) and satisfaction (PUSH-EM: 91.7% vs. PUSH-NEM: 92.5%; p = 0.17). Regarding the feasibility, the groups were also similar [SUS questionnaire: PUSH-EM: 77.5 (66.9–83.1) vs. PUSH-NEM:77.5 (63.8–82.5); p = 0.75) and perceived difficulty: PUSH-EM: 33.3% vs. PUSH-NEM: 22.2%; p = 0.19)].
Conclusion: Although the adherence is slightly below the expected threshold (80%), the PUSH tool seems to be overall acceptable and feasible in NH, regardless of external motivation. Before implementing PUSH in larger scale to maintain autonomy, the assessment of its benefits is needed.
Disclosure: FB is supported by the FNRS (Fonds National pour la Recherche Scientifique).

P480
ASSESSING GAMOTION'S ADAPTATION FOR REVALIDATION CENTERS: ENHANCING REHABILITATION PERSPECTIVES

F. Buckinx[1], C. Reggers[2], P. Frankinet[3], J.-Y. Reginster[1], O. Buyère[1]

[1]WHO Collaborating Centre for Public Health Aspects of Musculoskeletal Health and Ageing, Research Unit in Public Health, Epidemiology and Health Economics, Univ. of Liège, [2]Dept. of Sport and Rehabilitation Sciences, Univ. of Liège, [3]Musculoskeletal Medicine Service, CHU of Liège, Liège, Belgium

Objective: The GAMotion, a giant physical activity board game, was originally designed to promote physical activity in nursing homes. This study aims to evaluate the adaptability of the GAMotion for use in revalidation centers.
Methods: Patients and healthcare staff from the Esneux rehabilitation center were surveyed to assess their perspectives on the suitability of GAMotion (design and content) for patients undergoing rehabilitation at the center. The questionnaire comprised six closed questions rated on a 4-point Likert scale (not at all agree, disagree, somewhat agree, completely agree).
Results: Out of the 44 patients (61% men, 63.3 ± 13.1 years) surveyed, 30% had Parkinson's disease, 23% had experienced a stroke, and 73% could walk without technical support. Patients predominantly found GAMotion's design suitable (91% completely or somewhat agreed). They perceived exercises as tailored (84% somewhat or completely agreed) and easy to understand (77% somewhat or completely agreed). However, a majority felt exercise difficulty wasn't adjusted adequately (45%). Half were highly motivated (50% completely agreed). Twelve healthcare professionals (25% men, 32.3 ± 9.1 years, 92% physiotherapists) also participated. They generally found exercises suitable (75% completely or somewhat agreed). Opinions on the game square size varied (50% somewhat or completely agreed). Most observed correct exercise execution (92% somewhat or completely agreed). A majority believed GAMotion improved patients' motor capabilities (85% somewhat or completely agreed). All agreed that patients were motivated to use GAMotion.
Conclusion: Patients and healthcare professionals' positive feedback confirms GAMotion's applicability in rehabilitation. However, participants offered suggestions for improving GAMotion, including adding upper limb strengthening and increasing exercise difficulty, which could be considered in a new version.
Disclosure: FB is supported by the FNRS (Fonds National pour la Recherche Scientifique).

P481
A PROJECT OF OCCUPATIONAL THERAPY TO PREVENT SARCOPENIA IN ELDERLY PATIENTS

F. D'Amico[1], R. D'Amico[2]

[1]Univ. of Messina, Messina, [2]Rehabilitative Medicine Unit IRCCS Oasi, Troina, Italy

Objective: The aim of the integrated OT programme was to evaluate the prevalence of sarcopenia and osteoporosis in hospitalized patients in order to customize rehabilitation due to femoral fractures. Sarcopenia as a syndrome causes a progressive general muscle and muscle strength loss leading to increasing negative outcomes like disability and poor quality of life.
Methods: 73 elderly patients with femoral fractures have been hospitalized for 12 months. They have been assessed through a multifaceted (orthopedic-geriatric-rehabilitative) approach using MMSE, BADL, IADL, Barthel Index. Sarcopenia and osteoporosis were assessed through DXA bone densitometry. Sarcopenia presents: (1) muscle loss; (2) muscle strength loss; (3) reduced physical abilities. A diagnosis descends from presence of criterium #1 plus criterium +2 or #3. 27 patients with femoral fracture and sarcopenia (M #16, F #21, aged 82 ± 4) were included in the study.
Results: The standing position recovery for 43 patients started within 3 d after prosthesis surgery due to femoral fracture. They were dismissed after a 15/25-d hospitalization. 30 elderly subjects recovering from osteosynthesis regained the sitting position in 2–3 d, load tests were made between 7–14 d and they left the unit 30/45 d after admittance. At discharge 21 patients (M #9, F #12, aged 80 ± 3) affected by femoral fracture and sarcopenia were moved to the extended care unit for lack of assistance at home. There they followed an occupational therapy (OT) programme including aims like: (1) performing lower limbs mobilization through specific exercises; (2) working on muscle fibers type 2 to counterbalance the muscle loss. The group including patients following the programme was then compared to one including 8 subjects affected by femoral fracture and sarcopenia (mean age 77 ± 6) discharged and going home to their caregivers after femoral fractures. A 6-month individual OT programme at the extended care unit showed: (1) improvement in motor skills detected through scales scores (BADL 3.3/6 > 4.5/6—IADL 2.5/8 > 5.7/8—Barthel Index 50/100 > 90/100); (2) improvement both in muscle mass and muscle strength.
Conclusion: Aims of orthogeriatrics were: (1) improve mobilization and motor reactivation; (2) diagnosis and treatment in case of medical complications or comorbidity aggravation; (3) treatment of acute diseases postponing surgery; (4) customized physical activity programme at discharge. Effectiveness of a OT programme focused on motor reactivation and muscle strengthening aimed at patients discharged after femoral fractures and osteosynthesis, was evaluated. The occupational therapist approach was customized so that elderly patients continuing rehabilitation in residential structures regained self-assurance and independence.

P482
FRACTURE LIAISON SERVICES IN IRELAND: REPORT OF A 2ND NATIONAL DATABASE

F. Dockery[1], A. Glynn[1], R. Kiely[1]

[1]National Fracture Liaison Service Database, National Clinical Programme for Trauma and Orthopaedic Surgery, RCSI

Objective: Osteoporotic/'fragility' fractures are a major burden on healthcare and on society. In Ireland they occupy more bed days than cancer, heart disease or COPD and numbers are set to rise steeply, as Ireland has had the largest growth rate of older people within the EU. Fracture Liaison Service (FLS), a globally-recognised, evidence-based healthcare system is the gold standard for secondary fracture prevention and we established a national FLS database (FLS-DB) in 2020 to address fracture prevention.
Methods: Data on patients over 50 y with recent non-hip fragility fracture are captured by local FLS around the country using a web-based IT system. Data on fracture risks, falls risks, DXA, osteoporosis treatment, falls interventions and treatment adherence are recorded. Performance is measured against the International Osteoporosis Foundation (IOF) 'Capture the Fracture' Key Performance Indices.
Results: The 2nd national report for the calendar year 2022 included data from 9 FLS in Ireland. Each FLS is based in a Trauma hospital of which there are 16; the remaining 7 Trauma hospitals do not yet have a FLS. Data on 3195 fracture cases were submitted, vs. 2147 in 2021. This still represents just a third of expected fracture numbers at these 9 sites. Median patient age 69 y [50-100 y], 81% female. 35% were recommended osteoporosis drug treatment; 52% of these were of an injectable drug. Only a third of patients contacted after 4 months of their fracture could confirm they had started drug treatment as advised, highlighting the importance of this follow up call. Falls risk assessments and referral rates to exercise programmes were lower in 2022 than 2021. Though overall performance improved from 2021 in most fields, there was still a large amount of missing data and failure to meet the IOF standards.
Conclusion: The national FLS-DB is an important step towards making inroads into rising fracture numbers in Ireland. It may take a number of years of national data capture and benchmarking to impact performance however, as considerable improvements are needed in identification and management of fracture patients in Ireland based on the present data.

P483
CIRCULATING MIR-320A-3P AS POTENTIAL INDICATOR OF FRACTURE RISK IN OSTEOPOROTIC PATIENTS

F. Giusti[1], S. Donati[2], F. Marini[3], G. Palmini[3], C. Aurilia[2], I. Falsetti[2], G. Galli[2], F. Miglietta[1], T. Iantomasi[2], A. Isidori[4], L. Masi[1], M. L. Brandi[3]

[1]Metabolic Bone Diseases Unit, Univ. Hospital of Florence, AOU Careggi, Florence, [2]Dept. of Experimental and Clinical Biomedical Sciences, Univ. of Florence, Florence, [3]Fondazione Italiana Ricerca sulle Malattie dell'Osso (FIRMO Onlus), Florence, [4]Dept. of Experimental Medicine, Sapienza Univ. of Rome, Rome, Italy

Objective: The importance of microRNAs in controlling bone homeostasis and mineral metabolism has been stated. A growing number of studies have reported that several microRNAs regulate bone modelling and remodelling by modulating differentiation and activity of osteoblasts and osteoclasts. Deregulation of microRNA expression and/or activity has been associated with the occurrence of bone disorders, including osteoporosis (OP). In our previous study, we found that dysregulated serum levels of miR-320a-3p specifically correlated with fragility fracture, independently by BMD.
Methods: Cell-free total RNA containing primarily microRNAs, was extracted from sera of patients with OP fracture (PPOF) and of OP patients without any fragility fracture (PPONF). The presence of hemolysis in serum samples was assessed by spectrophotometry, evaluating the absorbance of free hemoglobin at 414 nm (A_{414}). Samples were considered hemolyzed if the A_{414} reading exceeded a value of 0.2. Differential miR-320a-3p expression was calculated by relative quantification using the $2^{-\Delta\Delta Ct}$ method, after normalization with miR-23a-3p and/or miR-21-5p. Real-Time qRT-PCR was performed in duplicate using the miRCURY LNA miRNA Probe PCR System. The diagnostic value of miR-320a-3p was calculated using Receiver Operating Characteristics (ROC) curve analysis. *p*-values less than 0.05 were statistically significant.
Results: No hemolysis was detected in our serum samples. The results of real-time qRT-PCR revealed that the expression levels of miR-320a-3p were remarkably reduced in the serum of PPOF patients compared to OP patients who did not experience any fractures. Receiver operating characteristic (ROC) curve analyses showed that serum miR-320a-3p levels normalized to miR-21-5p could discriminate PPOF from PPONF, with an area under the curve (AUC) value of 0.652 (sensitivity: 61%, specificity: 66%, cut-off value: 0.9490), while when its levels were normalized to miR-23a-3p showed an AUC value of 0.673 (sensitivity: 65%, specificity: 70%, cut-off value: 0.8815).
Conclusion: The downregulation of circulating miR-320a-3p is significantly associated with the occurrence of OP fractures. Additional studies are needed to confirm these data and to translate the use of serum miR-320a-3p as a prognostic indicator of fracture risk in OP patients into clinical settings.
Acknowledgment: Grant of Italian Ministry of Health Research Program: Bando Ricerca Finalizzata 2018_Project Code: NET-2018-12365454.

P484
IMPROVING THE INTEGRATION OF FRAGILITY FRACTURE SERVICES MAY REDUCE THE SUBSEQUENT INCIDENCE OF MAJOR TRAUMA DUE TO LOW-ENERGY INJURY IN OLDER PEOPLE

F. Guerreiro[1], M. Baxter[1], S. Tilley[1]

[1]Univ. Hospital Southampton NHS Foundation Trust, Southampton, UK

Objective: Major trauma due to low-energy injury (MTLE) in the elderly population has become more common with higher mortality and increased frailty post-trauma. Fragility fracture prevention is known to provide a significant cost-saving to the healthcare system. This study analyses the incidence of prior fragility fracture or osteoporosis in the elderly population who subsequently sustained a low-energy major trauma event. The aim is to review whether fragility fracture prevention could reduce the incidence or improve outcome on MTLE patients.
Methods: The Trauma Audit & Research Network (TARN) database retrospective review on patients more than 65 years old with an Injury Severity Score (ISS) of more than 15 after a low energy injury, between 1 January 2021 to 31 December 2022 in a regional major trauma centre. Electronic health records were interrogated for evidence of previous fragility fracture, diagnosis of osteoporosis, and Fracture Liaison Service (FLS) review.
Results: 254 patients were included in the final analysis. Of these 132 (52%) were female, 122 (48%) were male with a mean age of 82.9 years old, range (65.1-103.7). There were 42 patients with evidence of previous fragility fracture, 25 patients with previous diagnosis of osteoporosis, 11 patients with both. There were 55 patients who had at least one of the factors (22%); therefore, there is an incidence of 22% of older patients presenting with major trauma who have a history of osteoporosis or fragility fracture. There is low proportion of patients with previous FLS review, 8 patients (3%). 31 patients had fragility fractures, no diagnosis of osteoporosis and no FLS review. This group has a high mortality rate at 45% in an average of 1.5 y (1.0–1.9). This cohort outcome could potentially be improved with FLS review at their index fragility fracture
Conclusion: Major trauma carries high morbidity and mortality in elderly frail patients. Although most factors may not be modifiable, there could be a potential scope to intervene a cohort with previous fragility fracture with FLS review.

P485
PERFORMANCE OF OSTEOPOROSIS SELF-ASSESSMENT TOOL FOR ASIANS (OSTA) IN IDENTIFYING POSTMENOPAUSAL WOMEN AT RISK OF OSTEOPOROSIS

F. Hajivalizadeh[1], M. Darman[1], K. Etemad[2], N. Fahimfar[3], K. Khalagi[3], A. Ostovar[4], R. Mirmoeini[5], N. Fayazi[5], F. Torkman Asadi[5], H. Ghajari[1]

[1]Non-Communicable Diseases Control and Prevention Office, Ministry of Health and Medical Education, Tehran, [2]Center for Noncommunicable Disease Control and Prevention, Ministry of Health (MOH), Tehran, [3]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [4]Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [5]Non-Communicable Diseases Control and Prevention Office, Hamedan Univ. of Medical Sciences, Hamedan, Iran

Objective: The Osteoporosis Self-Assessment Tool for Asians (OSTA) score is one of screening tools has been developed to identify women at risk of osteoporosis. The objective of this study was to assess the performance of OSTA among women over 50 years old in Iran.
Methods: The study population was 953 women aged 50 or older living in Hamadan, one of the cities in the center of Iran. DXA was used as gold standard to measure BMD of participants. Osteoporosis in each area was defined as T-score ≤ -2.5 and osteopenia as $-1 >$ T-score > -2.5. The OSTA score calculated by subtracting age from weight and multiplying by 0.2. In the participants of the study, we compared the results of the OSTA with the osteoporosis status in total hip and neck of femur based on the BMD to assess the OSTA performance.

Results: The mean age of the participants was 70.43 with standard deviation 6.23. Out of 953 participants, 128 (13.43%) people had total hip osteoporosis and 446 (46.80%) had total hip osteopenia. More than half of the participants (55.36%) had neck of femur osteopenia and 18.17% had neck of femur osteoporosis. Evaluating the performance of OSTA for total hip osteoporosis showed that this risk assessment tool had a sensitivity 89.06%, specificity 47.27%, PPV 20.76%, and NPV 96.5%. Also, performance of OSTA for neck of femur osteoporosis showed a sensitivity 84.97%, specificity 48.46%, PPV 26.77%, and NPV 93.56%.
Conclusion: Overall, the OSTA had a good sensitivity to screen patients for hip and neck of femur osteoporosis. So, it is a suitable screening tool for use in the PHC where high sensitivity tools are needed.

P486
A BIBLIOMETRIC APPROACH TO THE SCIENTIFIC PRODUCTION ON FAMILIAL HYPOPHOSPHATEMIC RICKETS IN SCOPUS (2000–2022)

F. Hernández-García[1], H. Gil-Peña[2], J. Rodríguez Suárez[2], J. M. López García[1], R. Fuente Pérez[3], P. Oro Carbajosa[1], I. E. Corrales-Reyes[4]

[1]Univ. of Oviedo, Oviedo, Spain, [2]Hospital Universitario Central de Asturias, Oviedo, Spain, [3]Fundación Jiménez Díaz, Madrid, Spain, [4]Independent Researcher, Miami, USA

Objective: Hypophosphatemic rickets has been described as a disabling condition with a negative impact on physical functioning, activities of daily living, mental health, social life, and leisure activities. The most common cause are genetics such as X-linked hypophosphatemia. The evaluation of scientific production on familial hypophosphatemic rickets aids in understanding the research landscape, identifying opportunities for improvement, and promoting significant advancements in the knowledge and treatment of this medical condition.
Methods: An observational, descriptive, and cross-sectional study was conducted through a bibliometric analysis of scientific output on familial hypophosphatemic rickets, published in journals indexed in Scopus, during the 2020–2022. To retrieve the publications, Scopus was accessed on April 4, 2023, and an advanced search was performed using a filter by title, abstract and key words, source (journals), publication year, and type of articles (article and review). The terms used for the search were extracted from the PubMed Medical Subject Headings (MeSH) related to the disease included in the MeSH catalog. Additionally, an analysis of co-occurrence between countries and keywords was carried out with the VOSviewer software.
Results: The study found 1,269 articles on hypophosphatemic rickets (938 articles and 331 reviews). In total, they had received 39,548 citations with an H index of 95. The majority of the articles (76.9%) were published in high-impact journals (Q1 and Q2 journals). Scientific production shows a growing trend in recent years. The countries with the highest scientific production are the USA, Japan, and the UK, considering that middle and low-income countries contribute less to international scientific production.
Conclusion: The scientific production has shown sustained growth in recent years. USA solidifies itself as the country leading scientific production on hypophosphatemic rickets.

P487
POSSIBLE ENVOLVEMENT OF THE ENDOCANNABINOID SYSTEM IN THE ALTERED MINERALIZATION PROCESS IN MANDIBOLAR BONE FIBROUS DYSPLASIA

F. I. Falsetti[1], P. G. Palmini[2], A. C. Aurilia[1], D. S. Donati[1], M. F. Marini[2], M. L. Margheriti[3], G. G. Galli[1], Z. R. Zonefrati[2], I. T. Iantomasi[1], P. G. Picchioni[3], B. M. L. Brandi[2]

[1]Dept. of Experimental and Clinical Biomedical Sciences, Univ. of Florence, [2]Fondazione Italiana Ricerca sulle Malattie dell'Osso (F.I.R.M.O Onlus), [3]Stabilimento Chimico Farmaceutico Militare (SCFM)_Agenzia Industrie Difesa (AID), Florence, Italy

Objective: Fibrous bone dysplasia (FBD) is a rare bone disease in which bone mineralization is altered. The presence of the endocannabinoid system (ES) in bone has been demonstrated, and its possible role in bone mineralization process. Therefore, the aim of this work is to assess the alterations of the mineralization process in FBD and the involvement of ES.
Methods: First, we have evaluated the mesenchymal stem cell phenotype of the primary cell line isolated from a FBD lesion, marked as FD-1. We have evaluated the expression of the ES components genes and of osteogenic markers genes (OMGs) in normal growing conditions and in osteogenic differentiation process (OD) by TaqMan technology. The acquisition of the osteogenic phenotype has been evaluated through fluorometric assays and through cytochemical staining.
Results: The mesenchymal stem phenotype of FD-1 line and the presence of ES components under normal growing conditions has been confirmed. During OD we observed an increment of ALP activity at 14 days and a significant increase of HA deposits at 35 days. Data obtained revealed a positive modulation of OMGs in FD-1 line but, at the same time, the expression levels of OMGs resulted to be lower respect to those reported in a healthy pre-osteoblastic cell line induced to differentiate into osteoblasts. Our data revealed also that in FD-1 line under OD there is a modulation of ES components genes, like it has been observed in the healthy pre-osteoblastic cell line under OD.
Conclusion: We set up and characterized a primary mesenchymal stem cell line of FBD, reporting for the first time the presence of a stem cell population inside the FBD lesion. Our data not only confirmed that the osteoblastogenesis is altered in FBD, but also that there is a modulation of the ES components during this process which is different to that observed in healthy pre-osteoblastic cell line, leading to the hypothesis that the ES could be involved in FBD progression and representing a new way to understand the altered bone formation process of FBD.
Acknowledgments: Supported by Fondazione Ente Cassa di Risparmio di Firenze and by F.I.R.M.O Onlus.

P488
RELATIONSHIPS BETWEEN EARLY LIFE FACTORS AND OSTEOARTHRITIS PAIN: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY

F. J. Kirkham-Wilson[1], L. D. Westbury[1], N. R. Fuggle[1], F. Laskou[1], C. Cooper[1], E. M. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, Southampton, UK

Objective: Relationships between early life factors and musculoskeletal outcomes in later life have been well established, with previous reports suggesting that lower birthweight and weight at one year are associated with development of radiographic osteoarthritis (OA), specifically higher osteophyte number. Here we describe relationships between early life and development of pain among

participants with knee OA (Kellgren–Lawrence grade ≥ 2) at baseline, who were followed up for around 10 years.
Methods: 75 men and 68 women were recruited in 1998–2004. Baseline knee radiographs were taken and graded according to Kellgren- Lawrence. A mean of 10.8 years later, participants were invited to another research clinic where follow-up radiographs were taken, and pain recorded using WOMAC questionnaires. Questionnaires were administered at both time points to detail lifestyle and anthropometric factors. The analysis sample was restricted to those with radiographic knee OA at HCS baseline (K&L ≥ 2 at either tibiofemoral or patellofemoral joint on either left or right side). We also excluded participants with a history of knee replacement at either baseline or follow-up.
Results: Mean (SD) age at baseline was 64.8 (2.8) years; mean (SD) BMI was 27.5 (4.2). 41.3% of men and 50% of women had pain (WOMAC pain score > 0) at follow-up. Mean (SD) birthweight was 3.6 (0.6) kg and 3.5 (0.5) kg in men and women respectively. Greater weight at one year ($p = 0.01$) and greater infant weight gain ($p = 0.02$, independent of birthweight) were related to lower odds of knee pain at follow-up after adjustment for sex and follow-up time. For example, men with knee pain at follow-up had a mean weight at one year of 9.8 kg whereas this was 10.3 kg among men without knee pain at follow-up. Similarly, women with knee pain at follow-up had a mean weight at one year of 9.5 kg in contrast to 9.9 kg among women without pain.
Conclusion: Among subjects with baseline radiographic knee OA, greater weight gain in infancy was protective against pain associated with knee OA, attenuated after adjustment for follow-up osteophyte score. Our findings suggest associations between early life and both symptomatic and radiographic knee OA.

P489
WHAT IS THE ASSOCIATION BETWEEN REPRODUCTIVE FACTORS (EXCLUDING HRT USE) AND OSTEOARTHRITIS IN WOMEN?

K. Mcgill[1], J. Hammond[1], I. Shah[2], F. Kirkham-Wilson[1], R. Rambukwella[1], E. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, [2]Faculty of Medicine, Southampton Univ., Southampton, UK

Objective: Osteoarthritis (OA) is the most common form of arthritis. It becomes more prevalent in women around the age of menopause, leading to a higher prevalence in women compared to men in later life. It has therefore been suggested that the decrease in estrogen at menopause may be important in the pathophysiology of development of OA. The literature is conflicting however, especially around HRT use and OA, and a recent meta-analysis suggested that HRT use may actually be associated with an increased risk of joint replacement. In this systematic review we consider whether other reproductive factors are associated with an increased risk of OA.
Methods: Using PRISMA guidelines, a search strategy was generated to find articles using MEDLINE, CINAHL and Web of Science databases up to October 15, 2023. The articles were deduplicated using Endnote and imported to Rayyan where further deduplication was carried out. The titles and abstracts of the remaining articles were then screened independently by two reviewers, with final adjudication by a third reviewer. 14 papers, published over 26 years, were found to be relevant to the study. The papers were assessed for risk of bias.
Results: Of the 14 papers included, 4 were found to be of low quality. Sample size of populations studied ranged from 348 to 1134 680 with worldwide geographic variation. Hand, hip and knee OA outcomes were included. Increased parity was associated with increased risk of OA in 10 studies; use of the oral contraceptive pill was identified as a risk factor in 3 studies and spontaneous abortion and breast feeding were each associated as a risk factor in 2 studies. Relationships between higher parity and OA were observed in women of low/normal weight.
Conclusion: Several studies have suggested a positive association between several reproductive factors such as higher parity and OA. Further epidemiological analyses in newer cohorts are now required to support basic science research in this important subject area.

P490
COMPARISON OF FRAILTY SCREENING INSTRUMENTS ON PREDICTIVE OF DEPENDENCY IN THE OLDER INPATIENTS

F. O. Kayhan Kocak[1], M. Gürsu[2]

[1]Geriatric Medicine, Internal Medicine, Gazi Yaşargil Education and Research Hospital, Diyarbakır, [2]Internal Medicine, Bakircay Univ. Cigli Training and Research Hospital, İzmir, Turkey

Objective: Frailty and dependency in older patients can have significant implications for hospitalization. Older adults who are frail and dependent may face increased risks and challenges during hospital stays. The aim of this study is to evaluate the relationship between frailty screening instruments and dependency in Turkish older inpatients.
Methods: This cross-sectional study involving 127 subjects aged 65 years or older was conducted at tertiary hospital internal medicine inpatient clinic from September to November 2023. Frailty was defined by the Clinical Frailty Scale (CFS), the Seniors At Risk (ISAR) tool and Triage Risk-Screening Tool (TRST). Dependency was defined by Katz Index of Independence in Activities of Daily Living (ADL), The Lawton Instrumental Activities of Daily Living (IADL).
Results: A total of 127 subjects were examined, of which 72 (56.7%) were in the 75–101 years old subgroup with a median age of 82.5 y. There were 75 (59.1%) female subjects. According to the ADL and IADL, 44 (34.6%) and 91 (71.7%) were classified as dependency, respectively. Frailty was identified in 54 (42.5%), 108 (85.5%) and 73 (57.5%) patients according to CSF, ISAR and TRST, respectively. The AUC values of the CFS, ISAR and TRST were 0.969 (95% CI 0.942–0.996), 0.899 (95% CI 0.845–0.952) and 0.784 (95% CI 0.705–0.862) for predicting dependency in ADLs. The AUC values of the CFS, ISAR and TRST were 0.879 (95% CI 0.821–0.936), 0.760 (95% CI 0.677–0.843) and 0.737 (95% CI 0.648–0.827) for predicting dependency in IADLs.
Conclusion: Frailty, as measured by the CFS, is associated with an increased risk of adverse health outcomes, including dependency. The Clinical Frailty Scale is a valuable tool for assessing levels of frailty in older adults and, in place of the ISAR and TRST, can help healthcare providers anticipate and manage dependency issues during hospitalisation.

P491
ASSOCIATION BETWEEN FRAILTY SCALES AND THE LENGTH OF STAY AMONG OLDER PATIENTS

F. O. Kayhan Kocak[1], M. Gürsu[2], H. C. Fehmioğlu[2], B. Emekdaş[2]

[1]Geriatric Medicine, Internal Medicine, Gazi Yaşargil Education and Research Hospital, Diyarbakır, , [2]Internal Medicine, Bakircay Univ. Cigli Training and Research Hospital, İzmir, Turkey

Objective: Frailty is independently associated with morbidity and mortality among older patients. We investigated the relationship between frailty and length of stay in Turkish older inpatients.

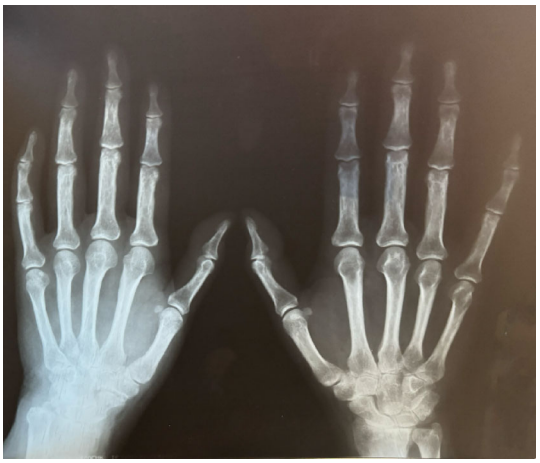
Methods: This cross-sectional study included 133 patients aged 65 years and older who were admitted from the emergency department to tertiary internal medicine inpatient unit between September 2023 and December 2023. Frailty status evaluated by the clinical frailty scale (CFS), the Seniors At Risk (ISAR) tool and Triage Risk-Screening Tool (TRST).
Results: The 133 participants (56 men, 42.1%) had a mean age of 76.8 ± 8.1 y, which ranged from 65–101. Frailty was present in 58 (43.6%), 114 (85.7%) and 76 (57.1%) of the patients according to CSF, ISAR and TRST, respectively. The mean length of stay was 6.6 ± 4.1 d. Three of the patients died during hospitalization. At the correlation analysis, we found that there was a positive correlation between the CSF score and length of hospital stay. ($p = 0.005$, $r = 0.244$). TRST and ISAR had no correlation with length of stay ($p > 0.05$, $r = 0.118$ and $p > 0.05$, $r = 0.116$, respectively).
Conclusion: We found that the frailty according to CFS is associated with a marked increase in length of stay in older patients. In the context of hospitalisation, the CFS, rather than ISAR and TRST, can play an important role in guiding healthcare decisions and providing appropriate care for older patients.

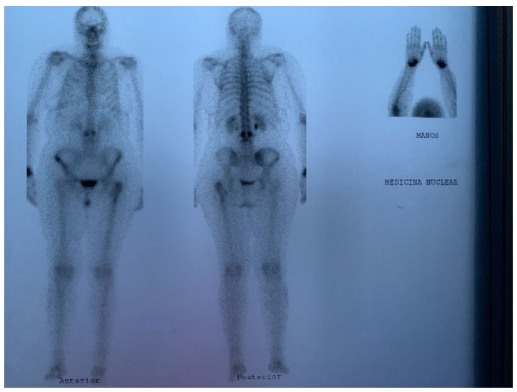
P493
RHEUMATOID ARTHRITIS AND POLYOSTOTIC PAGET'S DISEASE OF BONE: A CASE REPORT

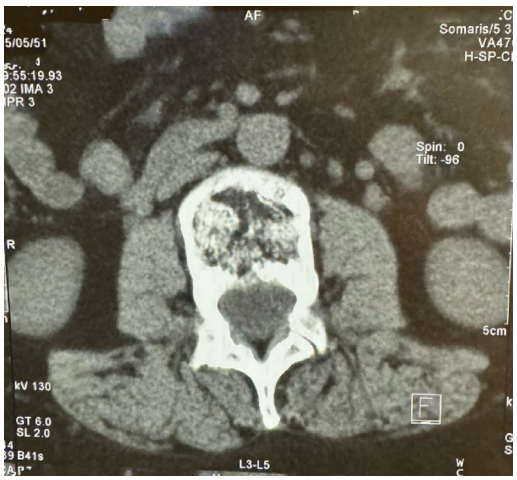
F. Rivas Santirso[1], P. Rivas Calvo[2], J. González García[3]

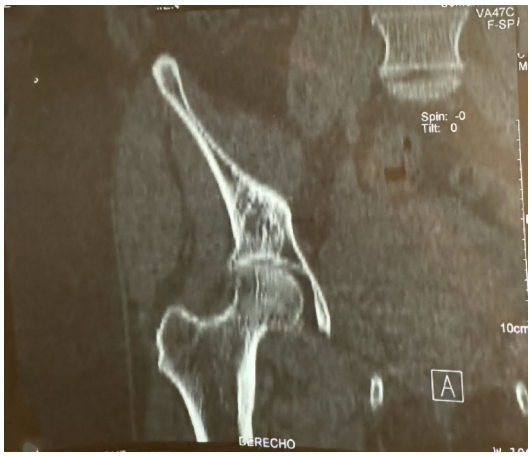
[1]Rheumatology and Rehabilitation Clinic Doctores Rivas, [2]Rheumatology and Rehabilitation Clinic Doctores Rivas (Segovia) and San Pablo CEU Univ. (Madrid), [3]Radiodiagnosis Service, Recoletas Hospital, Segovia, Spain

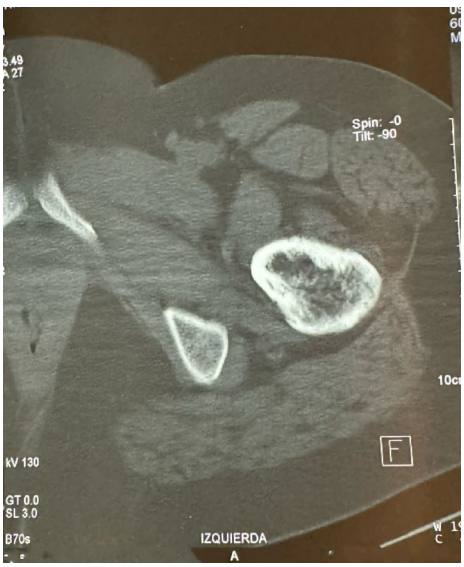
Rheumatoid Arthritis (RA) is a systemic autoimmune disease of unknown cause that mainly causes inflammation with symmetric synovitis of the peripheral joints and usually does not involve the lumbar spine. Paget's disease of bone (PDB) is a progressive monostotic or polyostotic metabolic bone disease which is characterized by a focal abdormal bone remodeling, with increased bone resorption and new bone formation which is excessive and disorganized. RA has been associated with PDB in 1% of cases, but there are not many recent studies.
Casereport: A 61-year-old Caucasian woman who 6 months before going to the clinic had started with symmetrical polyarthritis affecting the shoulders, hands and knees, describing joint pain and stiffness mainly in the hands. Examination revealed synovitis in the carpi and knees. In laboratory tests: ESR, CRP, RF and CCP antibody values were significantly elevated. Serum alkaline phosphatase was 2 times as high as the upper normal limit. Analysis of the knee synovial fluid aspirate was consistent with inflammatory arthritis, no red blood cells or crystals and negative growth on bacterial culture. X-ray: showed symmetrical joint space narrowing and irregularities at the radiocarpal and intercarpal joints, more pronounced on the left hand. CAT scan: areas of mixed bone involvement, mainly blastic with lytic lesions affecting the vertebral bodies of L3–L4, iliac of the right left femoral shaft, trochanteric area and proximal third of the left femoral shaft. Bone scintigraphy with 99mTc: in the metabolic phase, shows pathological hyperfixation of the tracer radius in L3–L4, right iliac spine, right sacroiliac and proximal third of the left femur. Hyperfixation of the tracer in both shoulders, knees and significant pathological deposits in the wrists.











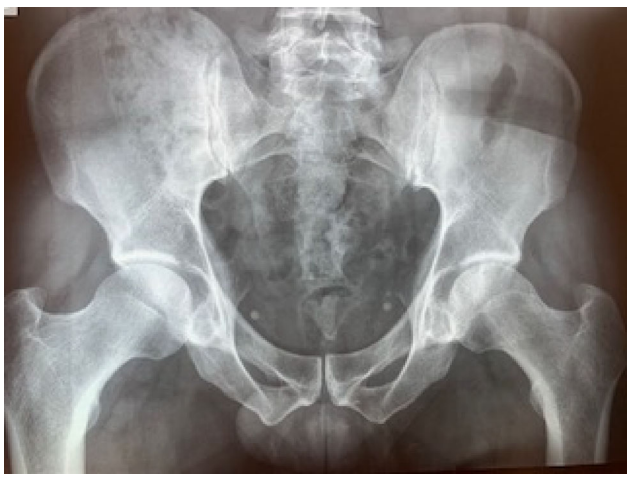
Conclusion: The diagnostic challenges associated with the rare coexistence of RA and PDB. Paget's disease of bone, should be considered as a new addition to the large family of osteoimmunological disorders. The cytokine profiles observed in this disease are also very similar to those observed in other osteoimmunological disorders that should probably be classified accordingly.

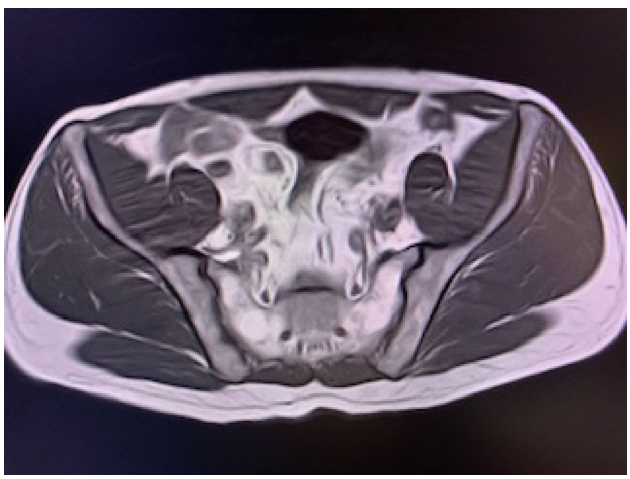
P494
ANKYLOSING SPONDYLITIS AND RADIOGRAPHIC EVIDENCE OF FEMOROACETABULAR IMPINGEMENT: A CASE REPORT

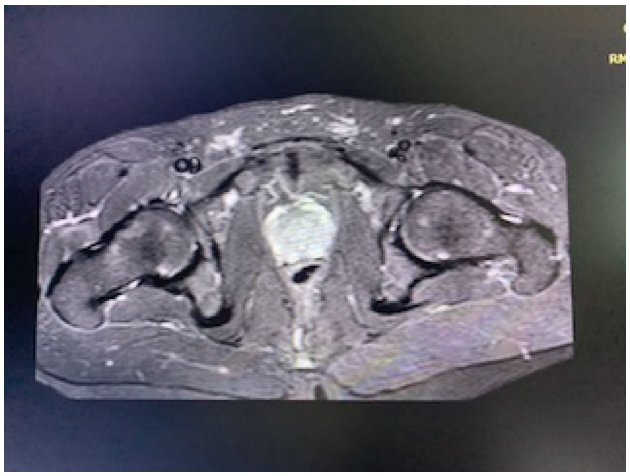
F. Rivas Santirso[1], P. Rivas Calvo[2], J. González García[3]

[1]Rheumatology and Rehabilitation Clinic Doctores Rivas, [2]Rheumatology and Rehabilitation Clinic Doctores Rivas (Segovia) and San Pablo CEU Univ. (Madrid), [3]Radiodiagnosis Service, Recoletas Hospital, Segovia, Spain

Ankylosing spondylitis (AS) is a chronic inflammatory disease of the axial skeleton with involvement of peripheral joints and non-articular structures. Main symptom is lower back pain; however, patients often present hip or groin pain misleading the clinician to think that the cause lies primarily in the hips. Hip involvement increases the burden and negative affects its prognosis of AS. Femoroacetabular impingement (FAI) has been recently identified as a major cause of early primary osteoarthritis (OA) of the hip. FAI refers to abnormal contact between the femoral head-neck junction or the acetabular rim. **Casereport**: A 38-year-old male who comes to the clinic with an inflammatory low back pain that has been going on for one year. He also reported alternating pain in the left buttocks and groin. He didn´t have systemic manifestations. His medical history included Achilles tendonitis and left plantar fasciitis. No family antecedents. Axial examination: no limitation of mobility or pain. Sacroiliac tests were positive bilaterally. Patrick's Faber and Fadir test were positive in the left hip with limitation to internal rotation. Laboratory: ESR: 34 mm/h (0–20); CRP: 12 mg/l (< 5 mg/l). HLA-B27+. The rest of the parameters (hemogram, RF, CCP-antibodies, biochemistry) were normal. X-rays: rectification of lumbar lordosis. Bilateral sacroiliitis, with subchondral sclerosis in both sacroiliac joints and partial effacement of the left and cortical erosion in the lower portion of the left joint. Loss of sphericity of both femoral heads with cam-type FAI and bilateral subchondral sclerosis. MRI: bilateral sacroiliitis with areas of signal change, pattern of edema in the subchondral bone marrow of sacral and iliac bone facets on both sides. Focal deformity in the anterosuperior contour of the cervico-capital femoral junction and increased alpha angle of both hips with cam impingement.







Conclusion: FAI pattern of hip involvement was seen in AS (36.7%), more frequent in male patients and associated with significantly greater grade of sacroiliitis (2.49 ± 1.19). Regarding type of FAI, pincer type was the most common pattern, followed by combined and cam types. Combined type FAI pattern had greater sacroiliitis score than pincer and cam-types.

P495
ASSOCIATION OF DYNAPENIA AND OBESITY WITH ALL-CAUSE MORTALITY: BIRJAND LONGITUDINAL AGING STUDY (BLAS)

M. Rahimi[1], F. Sharifi[2], M. Payab[3], M. Ebrahimpur[2], P. Ebrahimi[4], Z. Shadman[2]

[1]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [2]Elderly Health Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, [3]Non-Communicable Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, [4]Tehran Heart Center, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: To evaluate the effect of dynapenia, obesity and all-cause mortality of community-dwelling older adults.
Methods: The results of this study were come from BLAS. This study is an aging cohort study on a community dwelling older adults (≥ 65 y) that started in 2018. The death occurrence was registered by telephone interview with the family of the participants during September 2018 to end of 2023. The death was approved by provincial death registry of Birjand University of Medical Sciences. Hand grip was measured six times (three times in each hand) the maximum values were considered as value of hand grip. Dynapenia were respectively defined based on grip strength (< 26 kg for men and < 16 kg for women). Obesity was defined by BMI categorization. Univariate and multiple Logistic regression models adjusted for age, gender and number of morbidities were used for assessing association between dynapenic obesity and death.
Results: Mean age of the 1354 participants was 69.77 ± 7.55 y and 703 subjects of the participants were female. In the model after adjustment for age and sex, dynapenia without obesity was associated with all-cause mortality (odds ratio 2.27; CI 95% 1.09–4.71, P = 0.027). In final model after adjustment for age, sex and number of morbidities dynapenia, obesity and dynapenic obesity were not associated with all-cause mortality.

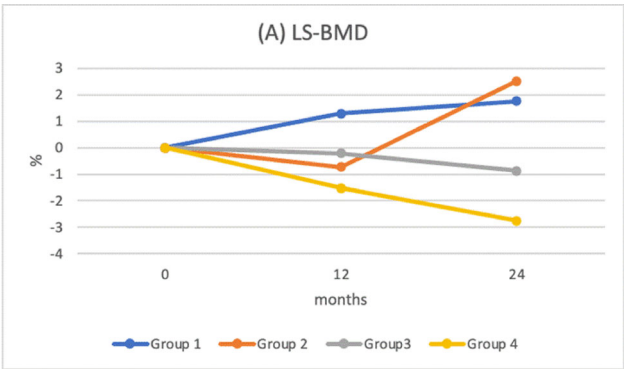
Conclusion: The risk of all-cause mortality may be higher in individuals with dynapenia but not obesity defines by BMI. Also, other factors such as presence of comorbidities may have a stronger effect on death.

P496
THERAPEUTIC STRATEGIES OF DENOSUMAB SEQUENTIAL THERAPY: A FOUR-ARMED MULTI-INSTITUTIONAL RANDOMIZED CONTROLLED TRIAL

F. Shau-Huai[1], L. Chia-Che[2], H. Chih-Chien[3], L. Chung-Yi[4], Y. Hung-Kuan[2], W. Chen-Yu[5]

[1]Dept. of Orthopedics, National Taiwan Univ. Hospital Yun-Lin Branch, Douliu, [2]Dept. of Orthopedic Surgery, National Taiwan Univ. Hospital, Taipei, [3]Dept. of Orthopedics, National Taiwan Univ. Hospital Yunlin Branch, Douliu, [4]Dept. of Public Health, College of Medicine, National Cheng Kung Univ., Tainan, [5]National Center for Geriatrics and Welfare Research, National Health Research Institutes, Yunlin, Taiwan

Objective: Denosumab, a RANKL inhibitor, is renowned for its long-term efficacy in improving BMD and reducing fracture risks. However, its discontinuation leads to a rapid rebound and BMD loss, necessitating effective follow-up interventions. This study aimed to evaluate four treatment regimens post-denosumab discontinuation in patients with osteoporosis.
Methods: The 2-y, multicenter, randomized controlled trial involved 101 postmenopausal women and men who had received biannual denosumab treatments for at least 2 y. The patients were randomized into four groups continued denosumab, zoledronate followed by denosumab, zoledronate for 2 y, and zoledronate followed by a supervised drug holiday. The primary outcome was the percent change from baseline at 24 months in BMD at various sites.
Results: An alternating regimen of denosumab and zoledronate could lead to a BMD enhancement (LS-BMD, 2.25%; IQR, 0.02–5.82%). A strategically timed zoledronate injection can maintain BMD for two years post-denosumab (BMD at the lumbar spine [LS-BMD], -0.71%; interquartile range [IQR], − 3.67% to 2.69%). However, a single zoledronate dose post-denosumab brings significant BMD loss (LS-BMD, − 2.76%; IQR, − 6.12% to 2.06%).



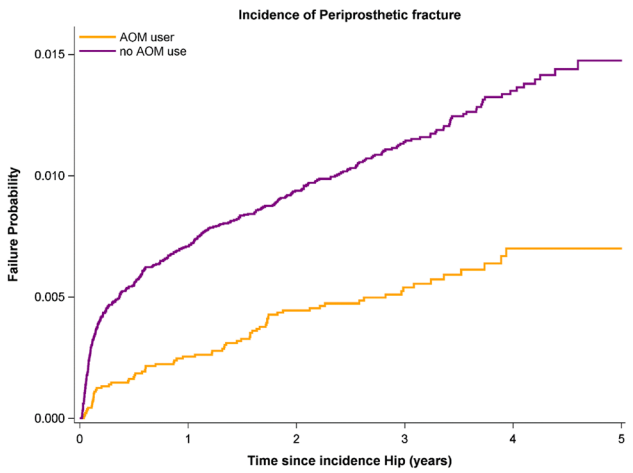
Conclusion: The study highlighted the "catch-up effect" in BMD upon resuming denosumab after a break, suggesting a potential reset in the body's response. Despite limitations like the short follow-up duration, the study provides novel insights into managing bone health post-denosumab discontinuation. Future studies should aim to validate the long-term therapeutic effect and the safety of the alternative regimen.

P497
PROGNOSIS OF PERIPROSTHETIC FRACTURES POST HIP FRACTURE: UNVEILING PROTECTIVE ROLE OF ANTI-OSTEOPOROTIC MEDICATION

F. Shau-Huai[1], Y. Hung-Kuan[2], H. Chih-Chien[3], Y. Rong-Sen[2], L. Chung-Yi[4], W. Chen-Yu[5]

[1]Dept. of Orthopedics, National Taiwan Univ. Hospital Yun-Lin Branch, Douliu, [2]Dept. of Orthopedic Surgery, National Taiwan Univ. Hospital, Taipei, [3]Dept. of Orthopedics, National Taiwan Univ. Hospital Yunlin Branch, Douliu, [4]Dept. of Public Health, College of Medicine, National Cheng Kung Univ., Tainan, [5]National Center for Geriatrics and Welfare Research, National Health Research Institutes, Yunlin, Taiwan

Objective: Periprosthetic fractures (PPF) near prior hip fracture fixation implants present formidable challenges due to intricate fracture patterns, implant presence, and compromised patient bone quality. Limited research exists on PPF prognosis in osteoporotic hip fracture patients. While anti-osteoporotic medication (AOM) effectively reduces secondary hip fracture risks, its impact on PPFs remains unexplored. Our study aims to address these gaps by assessing the influence of initiating AOM post-hip fracture on PPF occurrence and investigating PPF prognosis in a nationwide cohort of hip fracture patients.
Methods: This nationwide cohort study employs Taiwan's National Health Insurance Research Database (NHIRD) from January 1, 2016, to December 31, 2018, identifying 48,082 hospitalized hip fracture patients with concomitant procedures. Collected demographics include age, gender, comorbidities, and comedications. AOM use within one year post-hip fracture was examined. Primary outcome: periprosthetic fracture risk post-incident hip fracture. Secondary outcomes: subsequent osteoporotic fractures and PPF patient mortality. Fine and Gray's subdistribution hazard function explored risk factors and AOM effects on PPF.
Results: Among 48,082 patients with incident hip fractures, 30,182 (62.7%) were female, mean age 77.9 $\pm$ 10.7 y. Over 5 y, 443 (0.92%) developed PPF, with failure probability ranging from 0.58% (first year) to 1.25% (5-y follow-up). AOM users had lower cumulative PPF incidence at 5 y (0.53 vs. 1.08%). AOM post-hip fracture reduced PPF risk by 50% (HR = 0.5, $p < 0.0001$). Among 443 PPF patients, 22 (4.97%) had subsequent osteoporotic fractures, and 72 (16.25%) died within one year.



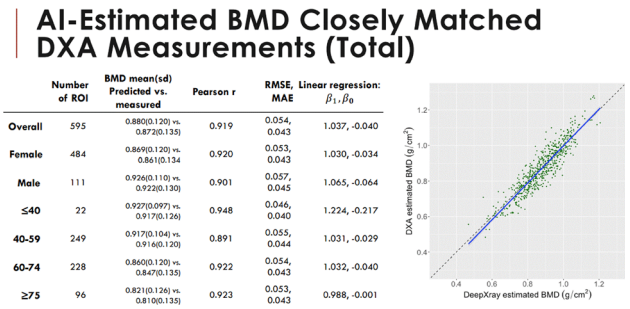
Conclusion: PPF following an incident hip fracture escalates the risk of imminent fractures and mortality within a year. Employing AOM post-hip fracture may effectively mitigate the risk of PPF.

P498
FROM PIXELS TO PREVENTION: AI-POWERED DIGITAL RADIOGRAMMETRY DEMOCRATIZES OSTEOPOROSIS DIAGNOSIS

F. Shau-Huai[1], L. Cheng Wei[2], L. Chia-Hung[2], J. Yu-Ming[2], T. Qingzong[2], L. Yen-Jun[3]

[1]Dept. of Orthopedics, National Taiwan Univ. Hospital Yun-Lin Branch, Douliu, [2]Alpha Intelligence Manifolds, Taipei, [3]Radiology Dept., Far-Eastern Memorial Hospital, New Taipei City, Taiwan

Objective: BMD, assessed through DXA, is the gold standard for diagnosing osteoporosis. However, the availability of DXA remains a challenge, especially in rural areas. This study investigates the estimation of BMD from standard pelvic radiographs as an alternative.
Methods: The study employed deidentified data from Far Eastern Memorial Hospital and three primary care clinics in Taiwan, including 2235 patients with 2321 paired pelvic radiograph-DXA samples. The BMD values obtained from standard DXA scan within $\pm$ 6 months of the Xray imaging time were used as the ground truth value for AI model training. A hip landmark model was developed to extract radiogrammetric parameters, such as Cortical Thickness Index and Femoral Neck Width. Test-time intensity augmentation and ablation studies were performed to assess feature contributions. An AI-augmented radiogrammetric BMD estimation model was developed based on the RegNet neural network architecture while incorporating radiogrammetric features. The model was trained with paired Xray-DXA data from 85% of the patients. The remaining 15% of patient data was reserved for model performance testing. Pearson correlation and RMSE between model-predicted and DXA-measured BMD were evaluated. Binary classification performance of the model for osteoporosis was also assessed.
Results: In the test set of 595 hip x-ray-DXA BMD pairs (81.3% female, mean age 61.4 y), the prevalence of osteoporosis was 24.7%. The Pearson correlation between predicted total hip BMD and measured BMD was 0.919. Subgroup analysis for female and male showed correlations of 0.920 and 0.901, respectively. Correlations remained strong across age groups. Predicted femoral neck BMD and measured BMD correlated at 0.868. Using a T-score ≤ -2.5 as the cutoff, the positive predictive value was 0.903, the negative predictive value was 0.907, and the ROC AUC was 0.950.



Conclusion: The AI model estimates BMD by radiogrammetry rather than absorptiometry, providing a robust and accurate BMD estimate that is highly correlated with DXA-measured BMD. This correlation allows rapid classification of osteoporosis according to established criteria. In addition, the implementation of an opportunistic screening strategy can expand diagnostic coverage, particularly benefiting rural areas.

P499
REAL WORLD CLINICAL OUTCOMES WHEN DISCONTINUED DENOSUMAB OR BISPHOSPHONATES IN SURGICALLY MANAGED PATIENTS WITH OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURE: A POPULATION-BASED COHORT STUDY

F. Shau-Huai[1], H. Chuan-Ching[2], W. Chen-Yu[3]

[1]Dept. of Orthopedics, National Taiwan Univ. Hospital Yun-Lin Branch, Douliu, [2]Dept. of Orthopedic Surgery, National Taiwan Univ. Hospital, Taipei, [3]National Center for Geriatrics and Welfare Research, National Health Research Institutes, Yunlin, Taiwan

Objective: The optimal osteoporosis treatment for patients with surgically treated osteoporotic vertebral compression fractures (OVCFs) is less investigated. This study compared the osteoporosis treatment outcomes between denosumab and bisphosphonates concerning subsequent osteoporotic fractures and mortality.
Methods: We conducted a retrospective nationwide cohort study using the National Health Insurance Research Database. Patients aged $\geq$ 50 y, admitted for surgical interventions for OVCF between 2012–2016, and subsequently received denosumab or bisphosphonates for one year were included. Patients were stratified according to their anti-osteoporosis medications and treatment adherence. A multivariable, time-varying Cox proportional hazards model was applied to evaluate the risks of osteoporotic fractures, vertebral fractures, non-vertebral fractures, and death.
Results: In this study of 2858 participants, denosumab (1123 patients) and bisphosphonates (1735 patients) were compared. Non-persistent denosumab users, persistent bisphosphonate users, and non-persistent bisphosphonate users had elevated risks of osteoporotic fractures (hazard ratios: 1.82, 1.78, 1.55). Non-vertebral fractures were significantly higher for non-persistent denosumab users, persistent bisphosphonate users, and non-persistent users (hazard ratios: 2.09, 1.86, 1.47). Only non-persistent bisphosphonate users showed an increased risk of vertebral fractures (hazard ratio: 1.72). Notably, non-persistent denosumab users had a significantly higher risk of death compared to persistent users (hazard ratio: 3.12).
Conclusion: Among patients with OVCFs requiring hospitalized and surgical intervention, those receiving ongoing denosumab treatment had less risk of developing subsequent osteoporotic fractures than those receiving bisphosphonates or non-persistent denosumab treatment. On the other hand, discontinuation of denosumab was associated with a significantly increased risk for subsequent fractures and death. Thus, adherence to the therapy is crucial for OVCF patients who initiated denosumab.

P500
RISK FACTORS ASSOCIATED WITH LOW BONE MINERAL DENSITY IN AXIAL SPONDYLOARTHRITIS

F. Z. Y. Heddi[1], K. Khelif[1], W. Zahdour[1], A. Benammar[1], Z. Lamri[1]

[1]Faculty of Medicine, Univ. of Oran 1, Rheumatology Dept., Oran Univ. Hospital, Oran, Algeria

Objective: To determine BMD and risk factors of low BMD in patients with spondyloarthritis.
Methods: This retrospective, single-centre study included 171 patients diagnosed with axial spondyloarthritis. BMD measurements of the lumbar spine (L1-L4) and femoral neck by DXA were used and WHO criteria were used for the diagnosis of osteopenia and osteoporosis. Univariable and multivariable linear regression analysis was performed to explore factors associated with low BMD.
Results: Of the 171 patients, 63 (41 males, 22 females) had BMDs, the mean age was 39.7 $\pm$ 14.8 y. The mean age at the diagnosis was 34.8 $\pm$ 12.9 y and the mean disease duration was 12.1 $\pm$ 9.5 y. HLAB27 was positive in 38.5% and smoking was reported by 22.2%. The mean BMI was 26.6 $\pm$ 6.8 kg/m^2 and 22 patients (34.9%) had coxitis. 72.4% had elevated erythrocyte sedimentation rate and 83% had elevated C-reactive protein levels. The mean ASDAS-CRP was 3.7 $\pm$ 1.1 and the mean BASDAI was 4.4 $\pm$ 2.3. Osteopenia and osteoporosis occurred in 23.8% and 17.5% of patients, respectively. Low BMD scores occurred in the lumbar spine in 57.7% of measurements and the femoral neck in 61.5% of measurements. Univariable linear regression showed that older age ($p = 0.004$), longer disease duration ($p = 0.02$), longer delay to diagnosis ($p = 0.006$), smoking ($p = 0.003$), obesity ($p = 0.05$), early-onset arthritis ($p = 0.04$) and the presence of biological inflammatory syndrome ($p = 0.04$) were associated with a low BMD. In multivariable linear regression analysis, only longer diagnostic delay and smoking were associated with low BMD.
Conclusion: 41.3% of patients with axial spondyloarthritis had low BMD. This decrease in BMD seems to be related to smoking and a longer diagnostic delay.

P501
IMPACT OF PERIPHERAL MANIFESTATIONS IN SPONDYLOARTHRITIS

F. Z. Y. Heddi[1], Z. Lamri[1], K. Khelif[1]

[1]Faculty of Medicine, Univ. of Oran 1, Rheumatology Dept., Oran Univ. Hospital, Oran, Algeria

Objective: To investigate the frequency of peripheral manifestations in patients with spondyloarthritis (SpA) and to evaluate their impact on treatment and patient-reported outcomes.
Methods: This observational, single-centre study included 192 patients diagnosed with SpA. Data collected were: demographics, disease characteristics, Peripheral manifestations (peripheral arthritis, peripheral enthesitis, or dactylitis), treatment, and patient-reported outcomes.
Results: 120 patients (62.5%) reported at least 1 peripheral manifestation during their disease course, 98 patients (51.0%) also had axial involvement. Among these, 13 (13.3%) showed at least 1 peripheral manifestation before axial symptoms, 59 (60.2%) concomitantly, and 26 (26.5%) after axial involvement. 57.8%, 40.6%, and 9.9% reported peripheral arthritis, peripheral enthesitis, and dactylitis, respectively. Among the whole population with peripheral joint disease, 23.4%, 37.9% and 38.7% of patients showed monoarticular, oligoarticular and polyarticular involvement, respectively. Peripheral manifestations were associated with older age ($p = 0.005$), longer disease duration ($p = 0.02$), longer delay to diagnosis ($p = 0.03$), psoriasis ($p = 0.002$), higher level of ESR ($p = 0.02$), HLA B27 negativity ($p = 0.05$), and absence of sacroiliitis on X-ray or MRI ($p = 0.03$). No significant differences were observed regarding the degree of disease activity as measured either by ASDAS or BASDAI and the function as measured by the BASFI between patients with and without peripheral involvement. Concerning treatment, 79.1% of patients with peripheral manifestation received csDMARDs, 41.6% bDMARDs and 28.7% had received glucocorticoids.
Conclusion: Peripheral manifestations appear in 62.5% of patients with SpA. Longer delay to diagnosis, psoriasis, and the absence of HLA B27 and radiographic sacroiliitis are associated with the development of peripheral symptoms.

P502
OSTEOPOROSIS AND FRAGILITY FRACTURE IN A PATIENT WITH B THALASSEMIA MAJOR: A CASE REPORT

F. Z. Y. Heddi[1], Z. Lamri[1], K. Khelif[1]

[1]Faculty of Medicine, Univ. of Oran 1, Rheumatology Dept., Oran Univ. Hospital, Oran, Algeria

Osteoporosis is a prominent cause of morbidity in β thalassemia major because of the increased risk for vertebral and long bone fractures. The aim of this case report was to raise awareness of thalassemia-induced osteoporosis, which is multifactorial, and whose management is very difficult. We present a case about a thalassemic young male with osteoporosis and multiple spine fractures.
Casereport: A 20-year-old male patient with β thalassemia major was referred to our Rheumatology Dept. for invalidating back pain with no history of trauma. The thoraco-lumbar X-ray showed a 6-level severe compression vertebral fractures of T5, T10, T11, L1, L3 and L4. Blood testing showed reduced values of hemoglobin, MCV, MCH, and vitamin D, hepatic cytolysis, and high levels of ferritine and serum alkaline phosphatase with normal calcium and phosphorus. The BMD measured by DXA was 0.324 g/cm^2 with a Z-score of − 4.5 standard deviation at the femoral neck and the total body bone density was 0.766 g/cm^2. The diagnosis of severe osteoporosis with multiple vertebral fractures was established. The patient suffered from β thalassemia major requiring transfusion once a month since childhood and iron chelating therapy with desferoxamine and he has a history of hypothyroidism, hypogonadism and splenectomy. His medications consisted of levothyroxine and testosterone undecanoate. He was treated with intravenous zoledronic acid 4 mg/y with calcium and vitamin D supplementation. The patient showed a decrease in spinal pain soon after initiation of therapy and the DXA showed a 6% increase in BMD at the femoral neck compared to the initial evaluation after one year of treatment. No further fractures were identified by VFA and thoraco-lumbar X-ray.
Conclusion: The development of osteoporosis in β thalassemia major patients is multifactorial, the factors included in this case were anemia, bone marrow expansion, Iron overload, hypogonadism, hypothyroidism and vitamin D deficiency. Zoledronic acid plus calcium, vitamin D supplementation improved the BMD.

P503
SEVERE OSTEOMALACIA SECONDARY TO UNDIAGNOSED CELIAC DISEASE: A CASE REPORT

F. Z. Y. Heddi[1], K. Khelif[1], Z. Lamri[1]

[1]Faculty of Medicine, Univ. of Oran 1, Rheumatology Dept., Oran Univ. Hospital, Oran, Algeria

Objective is to highlight the importance of considering asymptomatic celiac disease (CD) as a possible cause of osteomalacia. We describe a case report of a patient with severe osteomalacia and hyperparathyroidism.
Casereport: A 31-year-old woman, with an unremarkable medical history, was admitted to our department of rheumatology because of diffuse bone pain and proximal muscular weakness, which have progressed gradually over the last year. There was no trauma or fall. She denied any gastrointestinal symptoms. She appeared pale, and she had a waddling gait without limitation of the hips. Laboratory tests showed microcytic hypochromic anemia, hypocalcemia, hypophosphatemia, low 24-h urinary calcium and 25-hydroxy vitamin D levels, and a normal PTH level. Erythrocyte sedimentation rate, creatine phosphokinase, liver enzymes and renal function were normal. Skeletal radiographs showed Looser-Milkman fractures of the two pubic rami and costal fractures. Bone scintigraphy revealed a multifocal tracer uptake of Tc-99m. DXA scan showed a Z-score of –1.2 at lumbar spine and –2 at femoral neck. The diagnosis of osteomalacia was then confirmed. Upper gastrointestinal endoscopy with duodenal biopsy revealed diffuse villous atrophy consistent with the diagnosis of CD. Treatment with a gluten-free diet, supplemental calcium, vitamin D and iron was initiated, with a complete resolution of symptoms and normalization of biochemical parameters. At 6 months follow-up, assessment of bone and mineral metabolism revealed high calcemia, phosphaturia, 24-h urinary calcium, and PTH levels with normal phosphatemia and 25-hydroxyvitamin D levels. The findings of Sestamibi parathyroid scintigraphy were consistent with a single parathyroid adenoma, which was surgically removed. The postoperative biological assessment showed normal calcemia and PTH levels.
Conclusion: CD diagnosis should be suspected in any patient with osteomalacia. A gluten-free diet and supplemental vitamin D may reveal, during the follow-up, hyperparathyroidism with hypercalcemia masked by an undiagnosed CD.

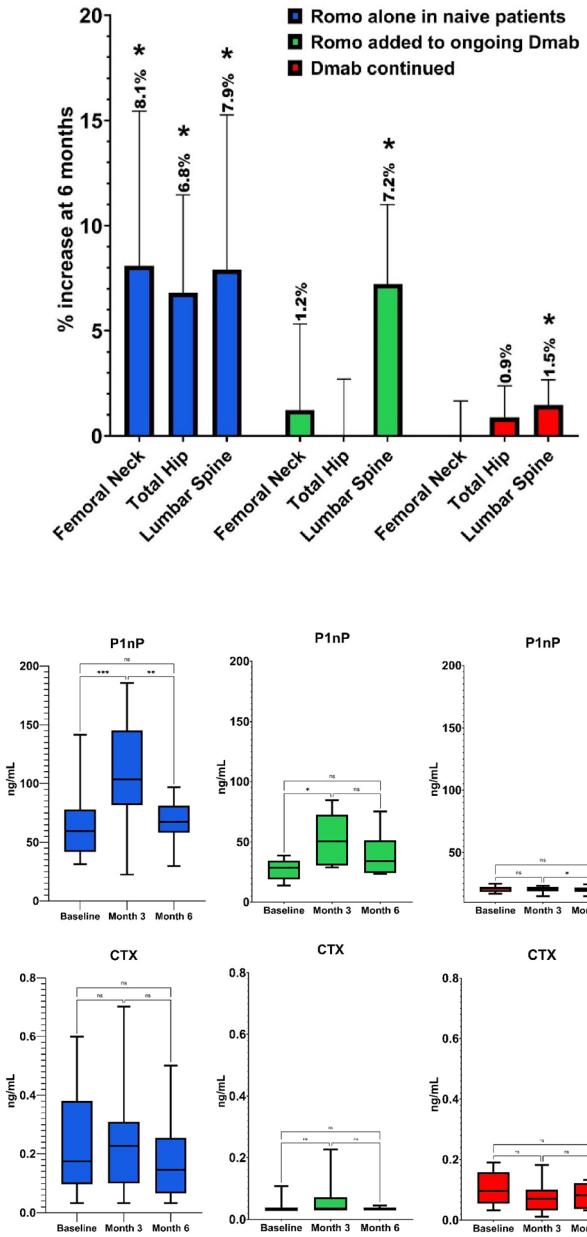
P504
ROMOSOZUMAB AND DENOSUMAB COMBINATION THERAPY IN POSTMENOPAUSAL OSTEOPOROSIS

G. Adami[1], A. Fassio[1], D. Gatti[1], O. Viapiana[1], C. Benini[1], M. Rossini[1]

[1]Univ. of Verona, Rheumatology Unit, Verona, Italy

Objective: Optimization of sequential and combination treatment is crucial in shaping long-term management of postmenopausal osteoporosis (OP). We aimed to investigate the effectiveness of the combination of romosozumab to ongoing denosumab treatment.
Methods: We conducted a 6-month prospective observational study on postmenopausal women with severe OP receiving treatment with romosozumab either alone (in patients naïve to treatment) or in combination with ongoing long-term denosumab (> 2 y). We also included a group of patients with ongoing denosumab (> 2 y) as a control group to isolate the specific effects attributable to romosozumab, especially on bone turnover markers (BTMs) and calcium metabolism. We collected serum samples for BTMs, bone modulators and calcium phosphate metabolism at baseline, month 3 and month 6. BMD was assessed at baseline and after 6 months.
Results: 52 postmenopausal women (73 ± 9.6 y) with OP were included in the study. Nineteen received romosozumab alone, 11 received romosozumab combined to ongoing denosumab and 22 continued denosumab alone. Baseline characteristics did not differ significantly between groups at baseline (including FRAXplus adjusted for recency of the fracture, 10y% fracture risk 37 ± 14 vs. 47 ± 16 vs. 33 ± 13, p NS). BMD increased significantly at all sites at 6 months of follow-up in the romosozumab alone group (femoral neck + 8.1%, total hip + 6.8% and lumbar spine + 7.9%). In contrast, BMD increased significantly only at lumbar spine in the combination group (+ 7.2%) and in the denosumab group (+ 1.5%) (Fig. 1). P1NP increased significantly in romosozumab groups at month 3 (+ 70.4% SD ± 64.5, p 0.0002 in romosozumab alone group; + 99.1% SD ± 100.5, p 0.027 in combination group). CTX decreased (not significantly) in the romosozumab alone group, whereas was suppressed (< 0.033) at all time points in combination group and denosumab alone group (Fig. 2). We found a small decline in calcium concentration at month 3 in the romosozumab alone group (− 2.8% SD ± 3.8, p 0.037), which settled back to normal concentrations at month 6 (-0.06% SD ± 4.1, p ns). Calcium did not change in the combination and denosumab alone groups. Sclerostin levels increased steeply in both romosozumab groups and Dkk1 did not change. After accounting for multiplicity using false discovery rate (Q value 5% of FDR), we found a significant positive association

between baseline sclerostin levels and delta femoral neck BMD between baseline and month 6 in patients receiving romosozumab alone (r2 0.408, p 0.047).



Conclusion: Romosozumab added to ongoing denosumab resulted in an increase in P1NP and lumbar spine BMD, but not in femoral neck BMD. For patients on denosumab, using romosozumab as an additional treatment appeared to be useful in terms of bone formation markers and spine BMD vs. denosumab alone.

P505

VALIDATION OF A NEW POINT-OF-CARE CALCANEAL ULTRASOUND DENSITOMETER (BEETLE)

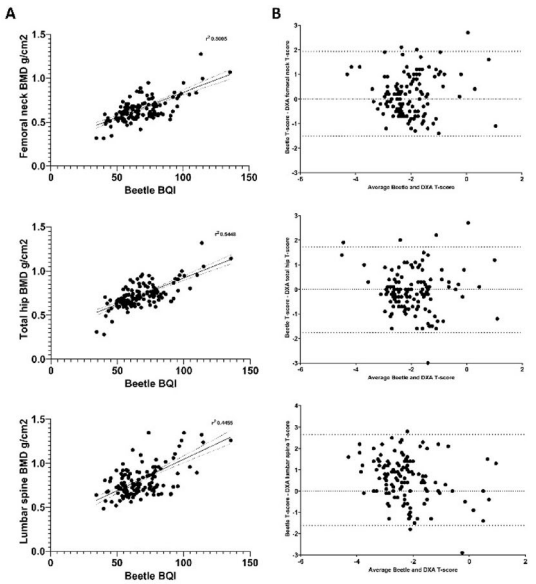
G. Adami[1], D. Gatti[1], O. Viapiana[1], C. Benini[1], A. Fassio[1], M. Rossini[1]

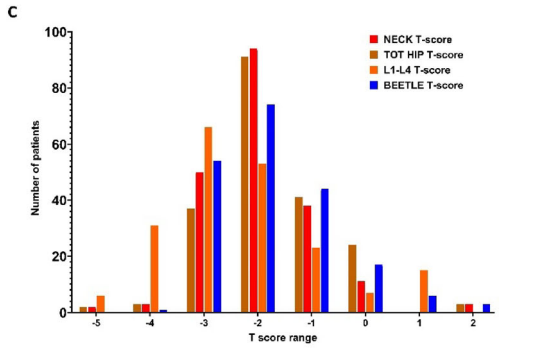
[1]Univesity of Verona, Rheumatology Unit, Verona, Italy

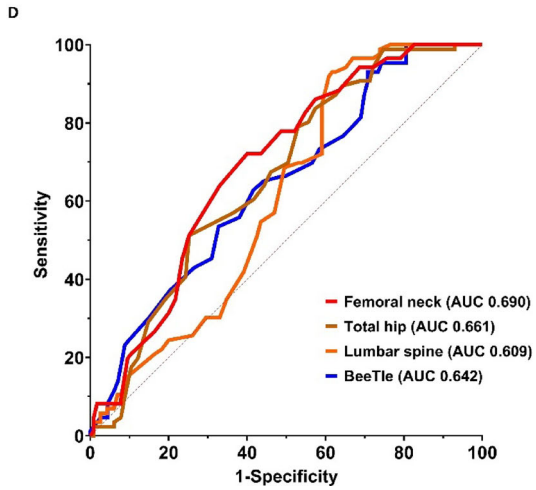
Objective: DXA represents the gold standard for measuring BMD. However, its size and bulkiness limit its use in mass screening. Portable and easily accessible instruments are more suitable for this purpose. We aimed to assess and validate a novel point-of-care ultrasound densitometer.

Methods: We conducted a study to assess the repeatability, sensitivity, accuracy, and validation of a new ultrasound densitometer for the calcaneus (BeeTLe) compared to standard DXA. BMD (g/cm^2) was measured at the femoral and lumbar spine levels using DXA (iLunar General Electric), and the Bone Quality Index (BQI, a dimensionless measure of bone quality) was measured with BeeTLe in patients attending the osteoporosis clinic at two bone specialist centers. The Bland-Altman test and simple linear regression were used to evaluate the association between values measured with the two instruments. Additionally, the ability of the T-score calculated with BeeTLe to identify patients with previous osteoporotic fractures was tested using ROC curves.

Results: A total of 201 patients (94.5% females) with a mean age of 62.1 ± 10.2 were included in the study. The BeeTLe instrument showed a coefficient of variation (CV, in 23 repeated measurements) of 1.22%, which was not statistically different from the CV of DXA (1.20%). Figure 1A shows the regression curves between BQI and BMD at the femoral neck (r2 0.500, $p < 0.0001$), total femur (r2 0.545, $p < 0.0001$), and lumbar spine (r2 0.455, $p < 0.0001$). Figure 1B displays the Bland-Altman plot for T-score differences at various sites. Figure 1C shows the distribution of T-scores with DXA and Beetle. Figure 1D presents the ROC curves describing the ability of BeeTLe and DXA at different sites to classify patients with fractures vs. non-fractured (AUC not significantly different).







Conclusion: In this preliminary study, BeeTLe, a new point-of-care ultrasound densitometer, demonstrated good repeatability and performance similar to DXA. Therefore, its use can be proposed in screening for osteoporosis.

P506
MACHINE LEARNING TO CHARACTERIZE BONE BIOMARKERS PROFILE IN RHEUMATOID ARTHRITIS

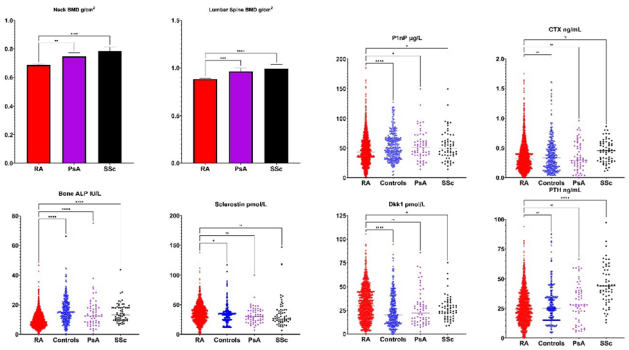
G. Adami[1], D. Gatti[1], C. Benini[1], O. Viapiana[1], A. Fassio[1], M. Rossini[1]

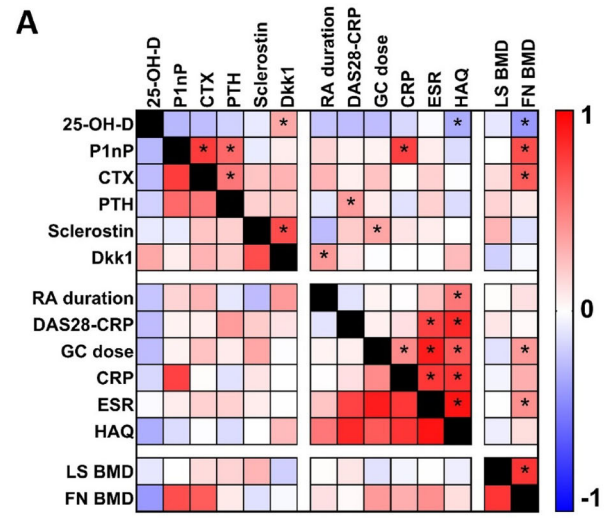
[1]Univesity of Verona, Rheumatology Unit, Verona, Italy

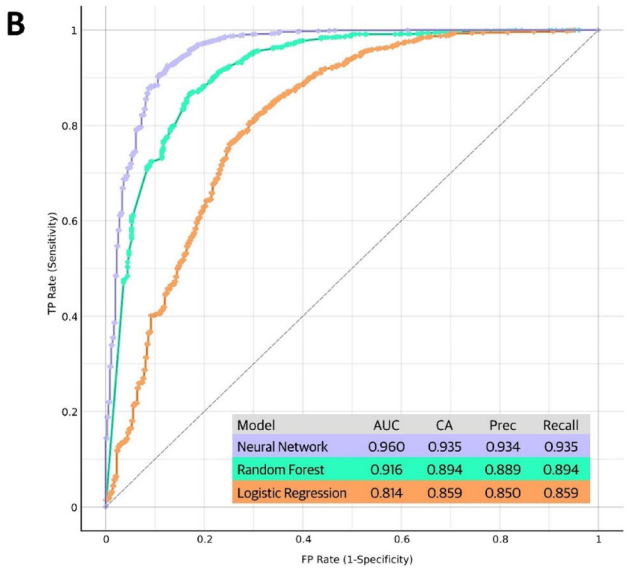
Objective: Bone metabolism is disrupted in rheumatoid arthritis (RA); however, the bone metabolic signature of RA is poorly known. The objective of the study is to further characterize the bone metabolic profile of RA and compare it to psoriatic arthritis (PsA), systemic sclerosis (SSc) and healthy controls.

Methods: We did a cross-sectional case-control study on consecutively enrolled patients and age-matched controls. We collected clinical characteristics, serum biomarkers related to bone metabolism and BMD. A multiple correlation analysis using Spearman's rank correlation coefficient was conducted within the RA patient group to investigate associations between biomarker levels and clinical variables. Machine learning (ML) models and principal component analysis (PCA) was performed to evaluate the ability of bone biomarker profiles to differentiate RA patients from controls. We ran three different ML models (random forest, neural network, logistic regression) considering the following features in addition to all serum biomarkers tested: cumulative glucocorticoid intake, age, gender, CRP levels, csDMARD and b/tsDMARD use. To assess the performance of these machine learning models, we employed standard evaluation metrics, including classification accuracy (CA), precision, recall, and receiver operating characteristic (ROC) curves with area under the curve (AUC) analysis. We implemented cross-validation (10 folds, stratified) to ensure the robustness of our models and mitigate overfitting.

Results: A total of 1883 participants were included in the analysis, comprising 1462 RA patients, 60 PsA patients, 62 SSc patients, and 359 age-matched healthy controls. We found significantly lower BMD in RA patients compared to PsA, and SSc groups. RA patients exhibited higher Dkk1, sclerostin and lower P1nP and B-ALP levels compared to controls. No significant differences in CTX levels were noted. Figure 1 shows the relevant markers. Correlation analysis revealed associations between bone biomarkers and clinical variables (Fig. 2A). PCA and ML highlighted distinct biomarker patterns in RA which can effectively discriminated bone biomarkers profile in RA from controls (Fig. 2B).







Conclusion: Our study helped uncover the distinct bone profile in RA, including changes in bone density and unique biomarker patterns. These findings enhance our comprehension of the intricate links between inflammation, bone dynamics, and RA activity, offering potential insights for diagnostic and therapeutic advancements in managing bone involvement in this challenging condition.

P507

LONG-TERM EFFECTS OF WEIGHT RESTORATION ON BONE MINERAL DENSITY (BMD) IN PATIENTS WITH ANOREXIA NERVOSA

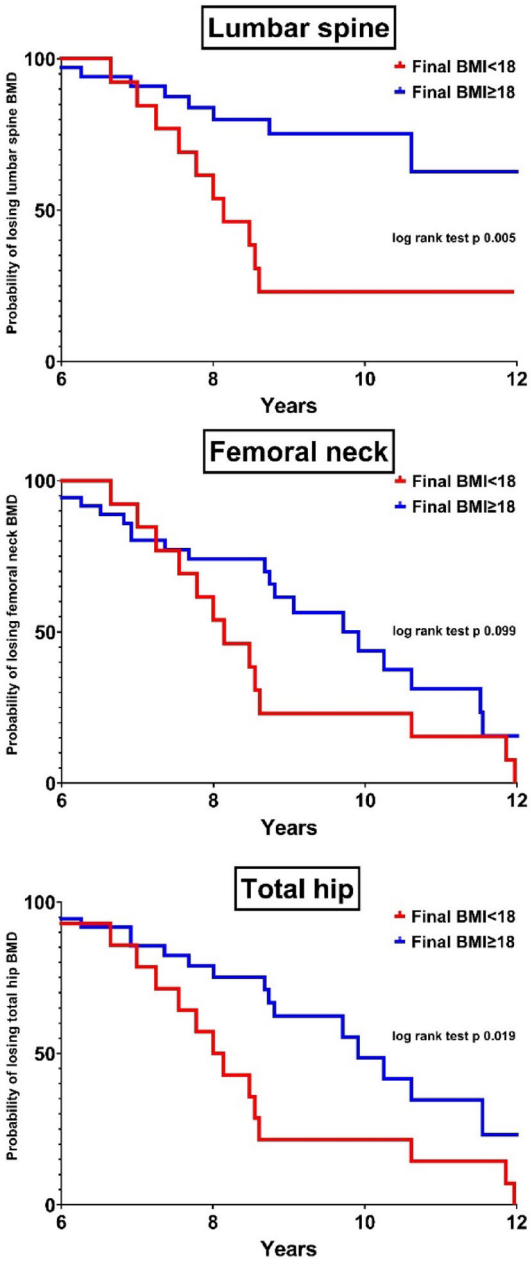
G. Adami[1], O. Viapiana[1], S. Calugi[2], M. Molgora[2], M. Chimini[2], B. Segattini[2], A. Dalle Grave[2], D. Gatti[1], R. Dalle Grave[2]

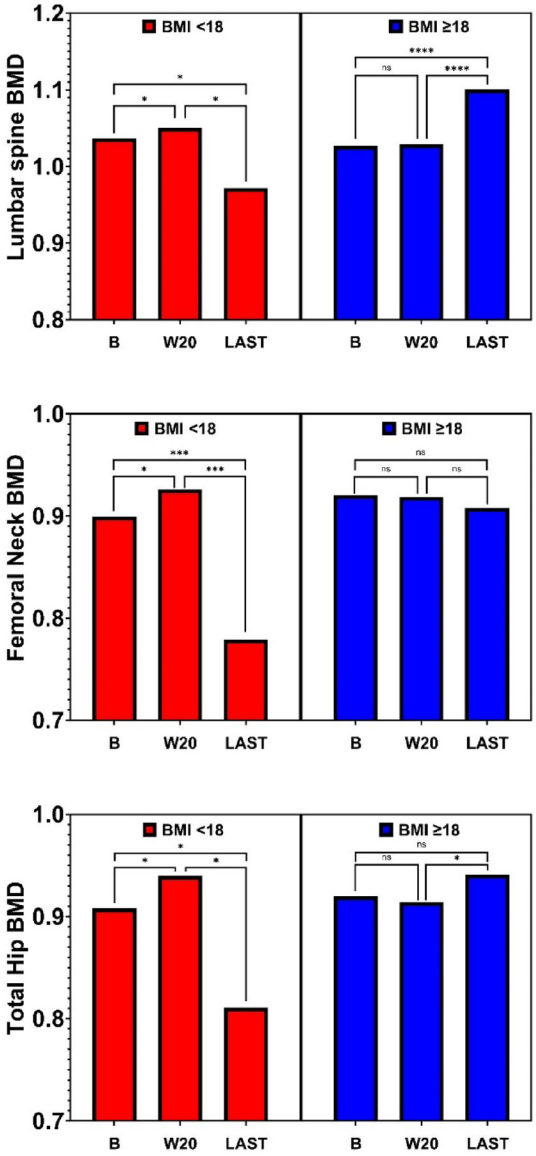
[1]Univesity of Verona, Rheumatology Unit, [2]Casa di Cura Villa Garda, Verona, Italy

Objective: Anorexia nervosa is an eating disorder characterized by extremely low BMI with consequent low BMD and higher risk of fractures. We aimed to investigate the long-term effects of body weight restoration on BMD in patients with anorexia nervosa.

Methods: We conducted a prospective observational study of patients with anorexia nervosa admitted to an eating disorder clinic for intensive weight restoration program, inpatient (20-week program) followed by an outpatient long-term follow-up. Clinical, demographic, body composition and BMD data were collected at baseline (admission), at week 20 (W20) and after > 5 y.

Results: 53 women were enrolled in the study. Mean age at baseline was 32 ± 9.2 y and the median follow-up was 8.0 y (IQR 9.1–7.0). Mean BMI at baseline was 15.8 ± 1.7. Lumbar spine BMD Z-score at baseline was -0.72 ± 1.14, femoral neck Z-score at baseline was -0.37 ± 0.97 and total hip Z-score at baseline was -0.40 ± 1.06. All patients had normal (> 20 ng/mL) 25-OH-vitamin D levels throughout the study. All subjects achieved BMI ≥ 18 at W20 and in aggregate BMD increased at all sites at W20. However, after a median follow-up of 8.1 years (IQR 7.3–8.6), 14 patients had BMI < 18 (weight loss after discharge—in red in the Figures), whereas 39 subjects kept BMI ≥ 18 over a median follow-up of 8.0 y (IQR 6.9–9.2), in blue in the Figures. Figure 1 shows the cumulative probability of losing BMD at various sites stratified by maintenance of BMI above or below the threshold of 18. Figure 2 shows the trend in BMD levels at the femur and lumbar spine in patients that maintained BMI ≥ 18 or < 18.





Conclusion: In aggregate, short-term weight restoration was associated with a significant increase in BMD at all sites. Keeping BMI $\geq$ 18 in the long term was associated with a positive non-plateau effect on lumbar spine BMD. In contrast, weight loss after discharge was associated with a significant bone loss at all sites.

P508

3D MODELING OF HIP DUAL-ENERGY X-RAY ABSORPTIOMETRY (DXA) IN POSTMENOPAUSAL WOMEN TREATED WITH ROMOSOZUMAB

G. Adami[1], O. Viapiana[1], D. Gatti[1], A. Fassio[1], C. Benini[1], M. Rossini[1]

[1]Univesity of Verona, Rheumatology Unit, Verona, Italy

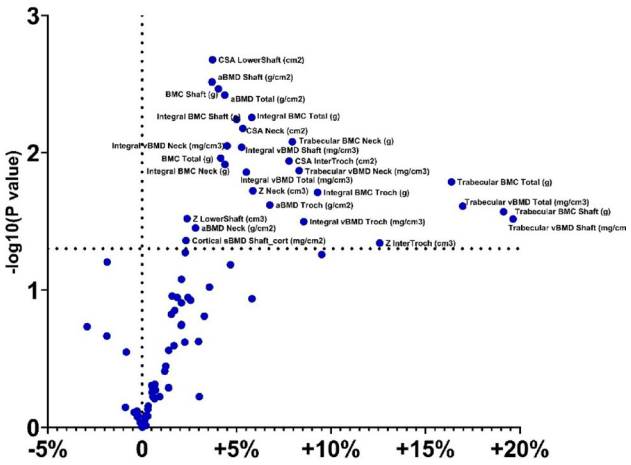
Objective: Romosozumab, a sclerostin inhibitor, can increase BMD faster and to a higher extent than any other anti-osteoporotic drugs available. However, the precise effects on cortical and trabecular bone are not fully clarified. We aimed to investigate the effect of

romosozumab on three-dimensional QTC-like parameters of cortical and trabecular compartments of the proximal femur.

Methods: We conducted a 6-monhts prospective observational study on postmenopausal women treated with romosozumab. Image files of the hip DXA scans at baseline and after 6 months of romosozumab were transferred for DXA-based 3D modeling (3D-SHAPER v2.10.1, Galgo Medical, Spain). In brief, the software built a QCT-like 3D proximal femur model for each DXA image, based on a database of QCT scans from a reference population. Integral, cortical and trabecular vBMD (mg/cm^3) were extracted. Other 3D-DXA measurements included: Cortical surface sBMD (mg/cm^2), cortical BMC (g), cortical and trabecular volume (cm^3), cortical thickness (mm), cross-sectional area (CSA, cm^2) and cross-sectional moment of inertia (CSMI, cm^4).

Results: 19 postmenopausal women were included in the study. The increase in aBMD were paralleled by a significant increase in most trabecular parameters but not cortical parameters. Figure shows the 6-month % increase in 3D-DXA parameters and p-values adjusted with Holm–Šídák method. In synthesis (list not complete—see Table for absolute variations and Figure for % variations in X-axis the % increase in the parameter and in Y-axis the − log10 of the p value, the higher the more significant change): Trabecular vBMD Total (mg/cm^3) increased from 74.82 to 83.56 (SE of difference 3,43, p 0.02), integral vBMD Total (mg/cm^3) increased from 194.7 to 204.4 (SE of difference 3.79, p 0.02), CSA InterTroch (cm^2) increased from 0.97 to 1.03 (SE of difference 0,02, p 0.01) and CSMI InterTroch (cm^4) increased from 3.46 to 3.68 (SE of difference 0.09, p 0.02).

	Adj P value	Mean of Month 6	Mean of Baseline	Difference	SE of difference
aBMD Neck (g/cm2)	**0,0404**	0,6825	0,6625	0,01998	0,009043
aBMD Troch (g/cm2)	**0,0293**	0,5455	0,5157	0,02978	0,01257
aBMD Shaft (g/cm2)	**0,0041**	0,8346	0,8064	0,02815	0,008569
aBMD Total (g/cm2)	**0,0067**	0,6973	0,6699	0,02745	0,008959
BMC Neck (g)	0,2941	3,203	3,059	0,1436	0,1328
BMC Troch (g)	0,1967	6,981	6,679	0,3015	0,2249
BMC Shaft (g)	**0,0053**	12,01	11,57	0,4401	0,1388
BMC Total (g)	**0,0141**	22,20	21,31	0,8852	0,3257
Cortical sBMD Total (mg/cm2)	0,1007	114,2	111,6	2,568	1,484
Trabecular vBMD Total (mg/cm3)	**0,0203**	83,56	74,82	8,738	3,432
Integral vBMD Total (mg/cm3)	**0,0198**	204,4	194,7	9,713	3,798
Integral BMC Total (g)	**0,009**	16,02	15,22	0,7984	0,2725
Integral BMC Neck (g)	**0,0218**	3,155	3,024	0,1307	0,05204
Integral BMC Troch (g)	**0,0213**	4,252	3,969	0,2837	0,1125
Integral BMC Shaft (g)	**0,0096**	8,609	8,225	0,3841	0,1326
Trabecular BMC Total (g)	**0,0089**	5,108	4,597	0,5114	0,1744
Trabecular BMC Neck (g)	**0,0103**	1,324	1,237	0,08687	0,03033
Trabecular BMC Troch (g)	**0,0159**	1,759	1,557	0,2019	0,07585
Trabecular BMC Shaft (g)	**0,0122**	2,025	1,803	0,2226	0,07989
Cortical BMC Total (g)	0,0973	10,91	10,62	0,2871	0,1641
Cortical BMC Neck (g)	0,2075	1,831	1,788	0,04382	0,03351
Cortical BMC Troch (g)	0,1266	2,493	2,411	0,08177	0,05104
Cortical BMC Shaft (g)	0,1172	6,584	6,422	0,1615	0,09812
Integral vBMD Neck (mg/cm3)	**0,0209**	245,7	234,3	11,40	4,503
Integral vBMD Troch (mg/cm3)	**0,0395**	144,3	135,2	9,081	4,091
Integral vBMD Shaft (mg/cm3)	**0,0158**	250,2	238,8	11,48	4,307
Trabecular vBMD Neck (mg/cm3)	**0,0194**	130,1	119,9	10,25	3,992
Trabecular vBMD Troch (mg/cm3)	**0,0298**	70,63	62,51	8,120	3,442
Trabecular vBMD Shaft (mg/cm3)	**0,0232**	79,47	70,21	9,262	3,734
Cortical vBMD Total (mg/cm3)	0,0913	678,5	666,6	11,96	6,705
Cortical vBMD Neck (mg/cm3)	0,0721	699,9	687,7	12,27	6,420
Cortical vBMD Troch (mg/cm3)	0,0558	566,8	553,9	12,91	6,316
Cortical vBMD Shaft (mg/cm3)	0,0754	752,1	736,9	15,26	8,089
Cortical Thickness Total (mm)	0,5677	1,674	1,665	0,008375	0,01439
Cortical Thickness Neck (mm)	0,546	1,509	1,498	0,01058	0,01719
Cortical Thickness Neck Lat (mm)	0,3662	1,000	0,9883	0,01180	0,01273
Cortical Thickness Neck Med (mm)	0,9588	2,515	2,513	0,001704	0,03250
Cortical Thickness InterTroch (mm)	0,7334	1,656	1,651	0,005127	0,01482
Cortical Thickness InterTroch Lat (mm)	0,6732	1,157	1,149	0,008578	0,02001
Cortical Thickness InterTroch Med (mm)	0,8112	2,653	2,659	-0,006075	0,02507
Cortical Thickness Shaft_cort (mm)	0,5162	2,451	2,439	0,01181	0,01783
Cortical Thickness Shaft_cort Lat (mm)	0,8002	2,341	2,333	0,007922	0,03084
Cortical Thickness Shaft_cort Med (mm)	0,9578	3,961	3,959	0,002056	0,03836
Cortical sBMD Neck (mg/cm2)	0,125	101,6	98,76	2,840	1,765



Conclusion: Romosozumab increased most trabecular 3D-DXA parameters in 6 months. Cortical parameters did not change over time.

P509
RADIOFREQUENCY ECHOGRAPHIC MULTI SPECTROMETRY (REMS) FOR NON-IONIZING ASSESSMENT OF BMD IN THE PEDIATRIC POPULATION

G. Adami[1], C. Caffarelli[2], S. Casciaro[3], A. Colucci[4], F. Conversano[3], A. Fassio[1], D. Gatti[1], S. Gonnelli[2], F. A. Lombardi[3], G. Luceri[4], P. Pisani[3], M. Rossini[1]

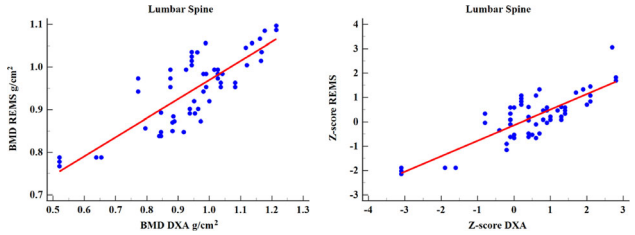
[1]Univ. of Verona, Policlinico GBRossi, Rheumatology Unit, Verona, [2]Dept. of Medicine, Surgery and Neuroscience, Univ. of Siena, Policlinico Le Scotte, Siena, [3]Institute of Clinical Physiology, National Research Council, Lecce, [4]R&D Dept., Echolight S.p.a., Lecce, Italy

*Equal contributors listed in alphabetic order

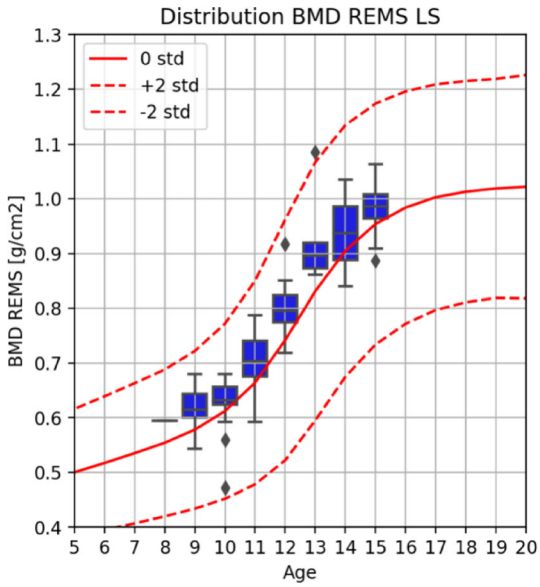
Objective: Starting from pediatric age, monitoring bone growth is important both in healthy subjects to prevent bone pathologies, and in pathological patients to timely identify any growth alteration. Since the use of X-ray is strongly restricted in pediatrics, REMS can represent a particularly suitable alternative to DXA on this patient categories thanks to its non-ionizing nature. REMS technology is already used for the assessment of bone health status and fracture prediction on the reference axial sites in adult subjects. The aim of this work is to evaluate bone health status in pediatric patients by a dedicated REMS algorithm.

Methods: In this preliminary study a cohort of 81 pediatric patients of both genders were unrolled (age < 15 y). All patients underwent REMS and DXA scan on lumbar spine (LS). Starting from REMS adults models, a new REMS-based algorithm has been developed to evaluate BMD and Z-SCORE in pediatric populations. The diagnostic agreement between REMS and DXA (BMD and Z-score parameters) was assessed by Pearson correlation coefficient.

Results: Significant correlation was found between REMS-BMD and DXA-BMD ($r = 0.81$; $p < 0.0001$), and between REMS-Z-score and DXA-Z-score ($r = 0.82$; $p < 0.0001$):



Although the number of considered patients was relatively low, for each considered age the REMS-based BMD distribution was in good agreement with the DXA-based reference curves, as shown in the Figure below.



Conclusion: The obtained results showed the REMS capability to assess the bone health status at the lumbar spine also in pediatric subjects. Therefore, REMS can represent an accurate non-ionizing technology to assess pediatric subjects, avoiding the use of X-ray on this fragile patient categories.

P510
PARTICULATED COSTAL HYALINE CARTILAGE ALLOGRAFT WITH SUBCHONDRAL DRILLING IMPROVES JOINT SPACE WIDTH AND SECOND-LOOK MACROSCOPIC ARTICULAR CARTILAGE SCORES COMPARED WITH SUBCHONDRAL DRILLING ALONE IN MEDIAL OPEN-WEDGE HIGH TIBIAL OSTEOTOMY

G. B. Kim[1], J. Y. Jung[2]

[1]Yeungnam Univ. College of Medicine, Daegu, [2]Gumi CHA Univ. Medical Center, Gumi, South Korea

Objective: To compare the articular cartilage regeneration based on second-look arthroscopy in patients who underwent medial open-wedge high tibial osteotomy (MOWHTO) combined with particulate costal hyaline cartilage allograft (PCHCA) implantation with those who underwent MOWHTO and subchondral drilling (SD). Moreover, we compared the clinical and radiographic outcomes between the groups.

Methods: From January 2014 to November 2020, patients with full-thickness cartilage defect on the medial femoral condyle who

underwent MOWHTO combined with PCHCA (group A) or SD (group B) were reviewed. Fifty-one knees were matched after propensity score matching. The status of regenerated cartilage was classified according to the International Cartilage Repair Society-Cartilage Repair Assessment (ICRS-CRA) grading system and Koshino staging system, based on second-look arthroscopic findings. Clinically, the Knee Injury and Osteoarthritis Outcome Score, the Western Ontario and McMaster Universities Osteoarthritis Index, and range of motion were compared. Radiographically, we compared the differences in the minimum joint space width (JSW) and change in JSW.

Results: The average age was 55.5 y (range, 42–64 y), and the average follow-up period was 27.1 months (range, 24–48 months). Group A showed a significantly better cartilage status than group B based on the ICRS-CRA grading system and Koshino staging system ($P < .001$ and $< .001$, respectively). There were no significant differences in clinical and radiographic outcomes between groups. In group A, the minimum JSW at the last follow-up was significantly increased than that before surgery ($P = .013$), and a significantly greater increase in JSW was observed in group A ($P = .025$).

Conclusion: When performed with MOWHTO, the combination of SD and PCHCA was associated with superior articular cartilage regeneration on the ICRS-CRA grading and Koshino staging on second-look arthroscopy performed at a minimum of 2 y follow-up than SD alone. However, there was no difference in clinical outcomes.

P511
ASSOCIATION BETWEEN SOCIAL SUPPORT AND MUSCULOSKELETAL HEALTH IN COMMUNITY-DWELLING OLDER ADULTS: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY

G. Bevilacqua[1], S. D'Angelo[1], F. Laskou[1], E. Zaballa[1], E. M. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK

Objective: Poor physical functioning and low BMD are common in later life and are associated with increased mortality and risk of fracture. Previous studies have suggested that social support, a measure of the emotional and practical assistance within an individual's social environment, are associated with physical capability and musculoskeletal health. Here we consider how different dimensions of social support relate to grip strength, physical capability tests, and BMD among community-dwelling older adults.

Methods: Participants were recruited from the Hertfordshire Cohort Study. Confiding/emotional, practical, and negative support (indicating that a participant would have liked to confide more with someone or talking to them made things worst) were assessed using the Close Persons Questionnaire. Muscle strength was measured by grip strength dynamometry. Physical capability was assessed by timed up-and-go, chair rises, and walking speed tests. BMD was assessed using DXA (Hologic QDR 4500). Outcomes were transformed into z-scores. Linear regression was used, and estimates were adjusted for age, sex, BMI, alcohol, smoking, physical activity, social class, and diet.

Results: 1842 men and women (mean [SD] age 65.7 [2.8] y) participated. Low emotional support (vs. high) was associated with weaker grip strength and poorer physical capability tests, although estimates were not robust to adjustment. Participants who received low practical levels of support completed the timed up-and-go (β − 0.171, 95% CI − 0.319, − 0.024) and walking speed (β − 0.157, 95% CI − 0.306, − 0.007) tests in shorter times. Negative aspects of social support were associated with lower grip strength (β − 0.145, 95% CI − 0.223, − 0.067), and slower walking speeds (β 0.159, 95% CI 0.004, 0.314). No social support exposures were associated with BMD.

Conclusion: Different types of social support are differentially associated with different measures of musculoskeletal health in older adults. Not unexpectedly, a limited requirement for practical support was associated with better physical capability. However, high negative aspects of social support were also associated with poorer physical capability outcomes. In contrast to physical performance measures, no measure of social support was associated with BMD. Further work is required to better understand these relationships to develop interventions to support older adults.

P512
RELATIONSHIPS BETWEEN SELF-PERCEIVED FRACTURE RISK AND FAMILY HISTORY IN THE HERTFORDSHIRE INTERGENERATIONAL STUDY: THE SAME OR DIFFERENT TO PERCEPTIONS REGARDING HEART DISEASE RISK?

G. Bevilacqua[1], L. D. Westbury[1], C. Cooper[1], E. M. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK

Objective: Self-perceived fracture risk (SPR) has been associated with fracture independent of FRAX objectively calculated risk, and links to osteoporosis medication uptake. A family history of fracture is an important predictor of personal fracture risk. We examined correlates of SPR among UK community-dwelling individuals, aged 21–70 y. We also compared the relationship between SPR and family history of hip fracture with the relationship between self-perceived risk of heart disease and family history of myocardial infarction.

Methods: We studied 303 participants from the Hertfordshire Intergenerational Study. Participants indicated whether they thought that their risk of breaking a bone was 'much lower', 'a little lower', 'about the same', 'a little higher' or 'much higher' compared to others of the same sex. Potential correlates examined included sociodemographic and lifestyle factors, comorbidity level (assessed by number of systems medicated) and family history of hip fracture. Associations between these exposures and SPR were explored using ordinal logistic regression with adjustment for sex and age. Statistically significant correlates ($p < 0.05$) were then included in a mutually-adjusted model along with sex and age. Relationships were compared with those between self-perceived risk of heart disease and family history of myocardial infarction.

Results: Median (lower quartile, upper quartile) age of participants was 56 (43, 61) y. The only factors related to SPR in all analyses were personal fracture history and number of systems medicated. Relationships between SPR and family history of hip fracture were much weaker than relationships between perceived heart disease risk and family history of myocardial infarction ($p = 0.37$ vs. $p < 0.001$).

Conclusion: This analysis highlights differences in perception of risk of clinical outcomes among individuals with a family history of hip fracture vs. myocardial infarction. It suggests that better education around how a family history of hip fracture impacts individual risk might be beneficial to empower individuals to make positive lifestyle and healthcare choices at a point in the lifecourse when such change might have substantial benefit.

P513
BODY COMPOSITION, BONE DENSITY AND BONE GEOMETRY IN URBAN AND RURAL INDIAN ADULTS

G. Bhat[1], A. Ireland[2], N. Shah[1], K. Gondhalekar[1], A. Khadilkar[1]

[1]Hirabai Cowasji Jehangir Medical Research Institute, Jehangir Hospital Pune, Pune, India, [2]Manchester Metropolitan Univ., Manchester, UK

Objective: Osteoporosis is a growing public health concern in India due to its large, rapidly-ageing population, whilst large-scale rural-urban migration is associated with changes in exposures such as physical activity and diet relevant to osteoporosis. We aimed to characterize differences in body composition, bone density and geometry in urban and rural Indians and study associated factors.
Methods: Sociodemography, 24 h diet recall, physical activity, tobacco consumption, sunlight exposure, anthropometry were assessed in 744 healthy urban (359) and rural (385) adults (men-346, women-398, mean age 53.3 ± 7.7 y) from Pune, India. Body composition, lumbar spine and femur BMD DXA and bone geometry at 4%/66% proximal-distal radius length (pQCT) were assessed.
Results: Rural participants had lower lean mass, fat mass, BMD and calcium intake ($p < 0.05$). Prevalence of osteoporosis was higher ($p < 0.05$) in rural men (10.7%) & women (42.6%) than urban men (6.2%) and women (18.1%). Regression analysis showed that BMD (spine/femur) was negatively associated with lower lean and fat mass indexes, increasing age, rural residence, and menopause in women. Trabecular density was positively associated with LMI in both sexes ($p < 0.05$) and calcium intake ($B = 0.024$, $p = 0.011$) in women. Periosteal circumference was higher in rural participants and was associated with LMI ($p < 0.05$). Endosteal circumference in women, was negatively associated with older age and urban residence and positively with tobacco consumption ($p < 0.05$). Stress-strain index was significantly higher in rural men and women and was positively associated with LMI ($p < 0.05$).
Conclusion: We found significant differences in body composition, bone density/geometry between urban and rural participants. While bone density (DXA) of rural participants was lower, higher bone cross-sectional area, periosteal circumference and SSIp in rural participants indicated a larger bone size with better bone strength. This could be explained by differences in genetic, environmental and lifestyle factors including mechanical loading via heavy physical activity, and greater sun exposure in rural participants. Greater endosteal circumference in rural participants indicated more age-related loss in bone mass.
Acknowledgement: Funding from Hirabai Cowasji Jehangir Medical Research Institute, Jehangir Hospital, Pune, India.

P514
OUTCOME OF ZOLEDRONIC ACID ON THE VERTEBRAL BODY BONE MINERAL DENSITY AFTER INSTRUMENTED INTERVERTEBRAL FUSION IN OSTEOPOROTIC POSTMENOPAUSAL WOMEN OF INDIA

G. C. Kakadiya[1]

[1]Topiwala National Medical College & BYL Nair Hospital, Mumbai, India

Objective: To evaluate the effect of zoledronic acid, an anti-osteoporosis treatment, during the perioperative period on vertebral body BMD after spinal fusion surgery in postmenopausal women with osteoporosis.
Methods: A Retrospective cohort study. The postmenopausal patients from India with osteoporosis who underwent instrumented intervertebral fusion for lumbar degenerative spine disease between July 2017 and May 2020 were included in this study. Patients with high comorbidities or conditions which might affect bone metabolism were excluded from this study. 92 patients did not receive any anti-osteoporosis treatment before surgery and during the postoperative follow-up (untreated group). Another 92 patients were treated with zoledronic acid perioperatively and were matched for age and BMI to patients in the untreated group. Preoperative and postoperative DXA records and lumbar BMD values of the involved spinal segments and of the cephalad levels, as well as of the femoral neck were recorded.
Results: The mean age in the treated group was 67.33 ± 10.14 and 67.17 ± 10.30 in the untreated group. a mean follow-up period of 8.89 ± 1.8 months. A significant decrease in cephalad vertebral BMD values was observed in the untreated group (− 11.46%, $P < 0.001$), with a slight decrease in the femoral neck (− 1.27%, $P > 0.05$). Zoledronic acid prevented rapid bone loss after instrumented intervertebral fusion surgery, with a bone loss in the cephalad levels of − 0.76 ± 4.73% compared to – 11.46 ± 16.45% in the untreated group ($P < 0.001$). while the change in BMD of the femoral neck in the treated group was 1.52 ± 5.89% compared to − 1.27 ± 6.57% in the untreated group ($P = 0.036$).
Conclusion: Perioperative zoledronic acid treatment may offer protection against a significant decrease in BMD of cephalad vertebrae after spinal fusion surgery among postmenopausal women with osteoporosis.

P515
ROLE OF TERIPARATIDE ON SUBSEQUENT VERTEBRAL FRACTURES AFTER SPINE FIXATION SURGERY FOR OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURES

G. C. Kakadiya[1]

[1]Topiwala National Medical College & BYL Nair Hospital, Mumbai, India

Objective: To assess the incidence and effect of teriparatide on subsequent vertebral fractures following a long-instrumented fusion surgery for osteoporotic vertebral compression fractures (OVCFs).
Methods: A retrospective study. A total of 94 patients who underwent long-instrumented fusion surgery (≥ 3 levels) for OVCFs with neurological deficits between 2016–2020 were enrolled in this study. Teriparatide was used in 38 patients (TP group). The mean age of the subjects was 75.6 y. The average of fused vertebrae was 4.9. The incidence of subsequent vertebral fractures was estimated with Kaplan–Meier analyses and compared between both groups using the log-rank test. Risk factors were evaluated using a Cox proportional hazards model.
Results: A total of 38% (36/94 cases) of the subjects were identified with subsequent vertebral fractures. There were no significant differences in the age, sex, fused levels, presence of prevalent fractures, and correction loss of the two groups. The occurrence of subsequent vertebral fractures was lower in the TP group than in the non-TP group (16 vs. 54%, $p = 0.014$). The log-rank test revealed that the TP treatment significantly reduced the risk of subsequent vertebral fractures ($p = 0.048$). A Cox proportional hazards model revealed that preoperative teriparatide treatment is only a protective factor of subsequent vertebral fractures after instrumented fusion surgery for OVFs (hazard ratio, 0.281; $p = 0.047$).
Conclusion: In this retrospective study, pre-and postoperative teriparatide treatment significantly reduced the incidence of subsequent vertebral fractures after instrumented fusion surgery for OVFs. A prospective randomized study is warranted to determine the efficacy of teriparatide treatments.

P516
POOR BONE QUALITY IN APPARENTLY HEALTHY MALES OFTEN NEGLECTED CLINICAL ENTITY

G. C. Kakadiya[1]

[1]Topiwala National Medical College & BYL Nair Hospital, Mumbai, India

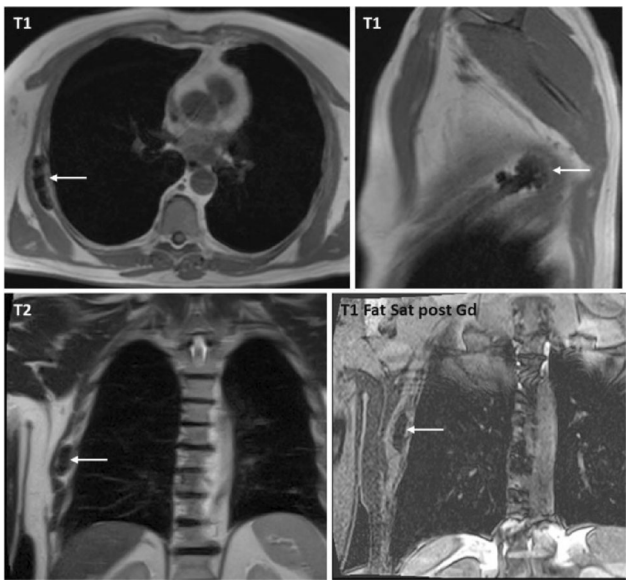
Objective: Current guidelines recommend BMD measurement in asymptomatic men above age 70 y and vertebral fracture assessment above 80 years with T-score < -1.0 with risk factors. We studied the prevalence of osteoporosis and morphometric vertebral fracture in asymptomatic males aged 60 y and above in India.
Methods: Free-living community-dwelling men (n = 482, age: mean ± standard deviation 68.0 ± 6.2 y) underwent a detailed history, physical examination, biochemical evaluation, and BMD measurements at three different sites: lumbar spine, total hip (TH), and femoral neck (FN). Morphometric vertebral fractures were assessed by instant vertebral assessment using Genant's semiquantitative method.
Results: We observed osteoporosis, osteopenia, and normal BMD in 19%, 56%, and 25% of subjects, respectively. The decade-wise prevalence of osteoporosis in the age groups 60–70 y, 71–80 y, and > 80 y was 16.9%, 17%, and 50%, respectively. Mean serum vitamin D3 levels were 17.2 ± 10.3 ng/mL. Vitamin D deficiency (65 ng/mL) was present in 68.8% and 45.4%, respectively. A vertebral fracture was present in 29.6% of subjects (grade I: 58%, grade II: 32.4%, and grade III: 8.8%). Age and serum PTH had a significant negative correlation with BMD at FN and TH. Serum 25-OHD had no correlation with BMD at any site. The prevalence of VF was positively associated with age (p = 0.018) and negatively associated with BMD at FN (p = 0.002) and TH (p = 0.013).
Conclusion: Osteoporosis and vertebral fractures are common in asymptomatic Indian males aged 60 years and above. Screening for osteoporosis and instant vertebral assessment may be recommended earlier than currently existing guidelines.

P517
A RARE BONE DISORDER: MELORHEOSTEOSIS-FLUOROSIS CONUNDRUM IN HYPOPARATHYROIDISM PATIENT

G. C. Kakadiya[1], P. Gedam[1]

[1]Topiwala National Medical College & BYL Nair Hospital, Mumbai, India

Osteosclerosis is a condition characterized by high BMD associated with disorders such as hypoparathyroidism, renal osteodystrophy, fluorosis and osteopetrosis. Hypoparathyroidism and fluorosis are two of the most common diseases causing sclerotic bone disease. Fluorosis also causes secondary hyperparathyroidism and has been implicated in renal dysfunction. The co-occurrence of these disorders is both rare and confusing.
Casereport: A 41-year-old male, previously diagnosed case of hypoparathyroidism presented with, fixed flexion deformity of the spine and limbs, episode of seizure, recurrent carpopedal spasms and low back ache. On examination, there were positive Chvostek's and trousseau signs, proximal muscle weakness and restriction of movement at both hip and spine, dental examination revealed mottling without any discernable pitting. On investigation, serum calcium was low (5.92 mg/dl), and serum phosphorus was high (7.82 mg/dl). Serum PTH and vitamin D levels were 2.9 pg/ml and 26.8 ng/ml respectively. X-ray was suggestive of osteopetrosis, DXA scan—left neck femur: + 3.8, lumbar spine: + 5.9. On further workup, the patient's drinking water fluoride content was measured and was found to be 12 ppm over 10 times the recommended WHO limit. The candle wax appearance especially in the tibia also posed melorheosteosis as a potential differential diagnosis but the fact that the patient hailed from the fluoride belt of Rajasthan and other features along with raised fluoride led us to the diagnosis of hypoparathyroidism with fluorosis and the patient was managed on oral calcium and calcitriol.



Conclusion: Hypoparathyroidism together with fluorosis is a rare entity and timely diagnosis can prevent morbidity and improve the quality of life.

P518
DOES BONE MINERAL APPARENT DENSITY FACILITATE ACCURATE IDENTIFICATION OF OSTEOPOROSIS IN SHORT POSTMENOPAUSAL WOMEN?

G. C. Kakadiya[1]

[1]Topiwala National Medical College & BYL Nair Hospital, Mumbai, India

Objective: Height is one of the most important aspects affecting the areal BMD. There are several height adjustments in children but none in widespread use for adults. This is specifically a problem in ethnic groups where mean height is substantially lower. We hypothesized that height adjustment of areal BMD would reduce the misclassification in short individuals.
Methods: This is a retrospective study involving 373 postmenopausal women. Their records were reviewed and bone mineral apparent density (BMAD) was calculated. Areal BMD T-scores and BMAD T-scores were then compared.
Results: The mean height of the cohort was 154.4 cm. There were 47 women who were defined as short ($\leq$ 147 cm). In short women, BMAD neither showed improvement nor decrement in T-scores, and BMAD T-scores predicted more osteoporosis than BMD T-scores. When divided into height ranges, taller women (> 160 cm) showed worsening of BMAD T-scores as compared to BMD T-scores (chi-square test for trend $P < 0.001$). Hence, BMAD might actually be "correct" for larger bones and not shorter bones.
Conclusion: BMAD was not found to be a suitable alternative in short postmenopausal women to accurately determine whether the low bone density in them is because of DXA artefact or whether they truly have a low density.

P519
PSEUDO-SEPTIC HIP ARTHRITIS AS THE PRESENTING FEATURE OF JUVENILE ANKYLOSING SPONDYLITIS: A CASE REPORT

G. C. Kakadiya[1]

[1]Topiwala National Medical College & BYL Nair Hospital, Mumbai, India

Juvenile onset AS differs from the adult form of the illness in that peripheral joint (like hip) arthritis is much more common and can precede, by many years, the onset of inflammatory back disease.
Casereport: A young male patient of 15 years started having hip pain (right > left) associated with limping. Initially, he was diagnosed as a case of right side TB hip but anti-tubercular therapy failed to improve his symptoms. After about 3 y he was again diagnosed with bacterial septic arthritis, this time of the left hip and managed for that. Finally, the diagnosis of juvenile onset ankylosing spondylitis (AS) was made based on modified New York criteria. Intervention: Emphasis was placed on the importance of a long-term home exercise program. Outcome: At a 2-month follow-up visit, the patient gained significantly in his ease of performing activities of daily living. Also, he was referred for surgical spinal osteotomy for kyphosis correction and/or bilateral total hip replacement.
Conclusion: Pseudo-septic hip arthritis as the presenting features of AS has been quite rare but may be expected in the juvenile onset variant.

P520
EFFECT OF INTRA-KNEE INJECTION OF AUTOLOGOUS ADIPOSE STEM CELLS OR MESENCHYMAL VASCULAR COMPONENTS ON SHORT-TERM OUTCOMES IN PATIENTS WITH KNEE OSTEOARTHRITIS

G. C. Kakadiya[1]

[1]Topiwala National Medical College & BYL Nair Hospital, Mumbai, India

Objective: Osteoarthritis (OA) of the knee is a prevalent degenerative joint disease that affects a staggering 350 million people worldwide. The study objectives were to assess the efficacy of single and multiple intra-articular injections of autologous adipose-derived stem cells (ASCs) and adipose-derived stromal vascular fraction (ADSVF) for the treatment of knee OA.
Methods: We conducted a thorough and systematic search of several databases, including PubMed, Embase, Web of Science, Cochrane Library, and ClinicalTrials.gov, to identify relevant studies. The included studies were randomized controlled trials (RCTs) that involved single or multiple intra-articular injections of autologous ASCs or ADSVF for the treatment of patients with knee osteoarthritis, without any additional treatment, and compared to either placebo or hyaluronic acid.
Results: A total of 7 RCTs were analyzed in this study. The results of the meta-analysis show that compared to the control group, both single and multiple intra-articular injections of ASCs or ADSVF demonstrated superior pain relief in the short term ($Z = 3.10$; $P < 0.0001$ and $Z = 4.66$; $P < 0.00001$) and significantly improved function ($Z = 2.61$; $P < 0.009$ and $Z = 2.80$; $P = 0.005$). Furthermore, MRI assessment showed a significant improvement in cartilage condition compared to the control group. ($Z = 8.14$; $P < 0.000001$ and $Z = 5.58$; $P < 0.00001$).
Conclusion: In OA of the knee, single or multiple intra-articular injections of autologous ASCs or ADSVF have shown significant pain improvement and safety in the short term in the absence of adjuvant therapy. Significant improvements in cartilage status were also shown. A larger sample size of randomized controlled trials is needed for a direct comparison of the difference in effect between single and multiple injections.

P521
NOVEL LOW-COST MODALITY TO AUGMENT PEDICLE SCREWS IN OSTEOPOROTIC SPINE: MERSILENE TAPE

G. C. Kakadiya[1], K. C. Chaudhary[2]

[1]Topiwala National Medical College & BYL Nair Hospital, [2]P D Hinduja Hospital & Research Centre, Mumbai, India

Objective: Gradually kyphosis and collapse are a natural history of osteoporotic vertebral compression fractures (OVCF). The principle of OVCF is fixing instability, providing anterior support, and decompression. The osteoporotic spine has weak and rarified trabeculae in the cancellous bone and pedicles, which offer little resistance against screw pull-out. The sublaminar implant relies on the lamina for holds which is the strongest part of vertebrae. The study purpose was to assess the safety and efficacy of sublaminar mersilene tape-augmented pedicle screws fixation as a novel and low-cost modality for OVCFs instrumentation fixation.
Methods: A retrospective study of 40 consecutive patients of the OVCFs. All patients were operated with open decompression, pedicle screw fixation, and sublaminar mersilene tape augmentation. Preoperative and postoperative clinical (visual analogue scale [VAS], modified Oswestry disability index [M-ODI], neurologic deficit, revision surgeries, and infection) and radiological (axial collapse, fracture union, implant failure/back out,) parameters were compared to describe the utility of sublaminar mersilene tape augmented pedicle screws for OVCFs treatment.
Results: Compete neurological improvement was noted in 38 patients and two patients had Frankel Garde D neurology. The mean VAS was significantly improved from preoperative 8.98 ± 0.60 to 2.76 ± 0.54, final follow-up and M-ODI from 80.10 ± 6.90 to 15.30 ± 6.90. The mean local kyphosis angle was improved from $23.20 \pm 5.90°$ preoperative to $5.30 \pm 3.9°$ postoperatively and $3.30 \pm 2.50°$loss of correction at final follow-up. There was no pseudoarthrosis and implant failure noted. No iatrogenic dural or nerve injury.
Conclusion: Sublaminar mersilene tape augmentation relies on the lamina for its hold, which is the strongest part of an osteoporotic vertebra. Sublaminar mersilene tape augmented pedicle screws fixation is a novel and low-cost modality for OVCFs. It provides significant improvement in clinical and radiological outcomes. This technique is an easy learning curve, is user-friendly and safe, which makes this a viable alternative option for OVCFs fixation.

P522
VERTEBROPLASTY WITH SHORT SEGMENT FIXATION VERSUS LONG FIXATION FOR OSTEOPOROTIC VERTEBRAL FRACTURE: A RETROSPECTIVE COMPARATIVE STUDY

G. C. Kakadiya[1]

[1]Topiwala National Medical College & BYL Nair Hospital, Mumbai, India

Objective: The thoracolumbar region is susceptible to injury because of its location between the stiff thoracic kyphotic and mobile lumbar lordotic. The osteoporotic vertebral compression fractures (OVCFs) can lead to delayed union or non-union and lead to progressive collapse that can result in kyphosis with the possibility of neurological deficit. There is controversy regarding the ideal treatment for OVCFs. The study purpose was to compare the safety and efficacy of

vertebroplasty with short-segmented cement-augmented pedicle screws fixation and long-segment fixation for OVCF in elderly patients.

Methods: A retrospective study of 182 single-level OVCF. 88 patients were treated by vertebroplasty and short-segment PMMA cement augmented pedicle screws fixation, and 94 patients were operated with long-segment posterior fixation. Local kyphosis angle, vertebral height, VAS, ODI and neurological state were compared and analysed.

Results: 48.35% of patients had short segment and 51.65% had long segment Spine fixation. Significant improvement was noted in VAS, ODI and neurological status in both groups. The mean kyphosis angle was corrected significantly from 19.08 ± 4.9° preoperative to 6.49 ± 2.59° immediately post-operative, and 8.62 ± 2.60° at one-year follow-up in the short segment group In the long segment group mean kyphosis was also corrected significantly from 23.20 ± 5.90° to 5.30 ± 3.9°immediate postop, and 8.60 ± 4.60° at one-year follow-up. Anterior vertebral height was restored from 56.10 ± 8.9 to 85.9 ± 11.2% postoperative in the short segment group. In the long segment, it was restored from 55.80 ± 11.9 to 87.6 ± 13.1. Four cases of cement leakage in the short-segment group. In the short-segment group, one patient had proximal junction failure, two had implant failure and it was four and six in the long-segment group respectively.

Conclusion: Both short-segment and long-segment fixation can restore local kyphosis for osteoporotic vertebral fracture with lower complication and faster pain relief. A short-segment stabilization has faster relief of pain, lesser tissue destruction, minimised blood loss, and shorter surgical duration with less stress risers at the junctional area.

P523
A COMPREHENSIVE ANALYSIS OF FACTORS INFLUENCING 1-YEAR MORTALITY IN ELDERLY WITH FRAGILITY HIP FRACTURES: INSIGHTS FROM THE FRAGILITY FRACTURE NETWORK TREATMENT—A PRELIMINARY REPORT

G. Chinvattanachot[1]

[1]Ramathibodi Hospital, Mahidol Univ., Bangkok, Thailand

Objective: To evaluate the factors affecting adverse outcomes of elderly fragility hip fractures (EFHF). In addition to commonly studied factors such as demographic data and surgical considerations, we also incorporated biological markers to study the predictive value of each factor, contributing to the development of a future prognostic scoring system.

Methods: A retrospective review was conducted on EFHF patients between 2020–2021. All patients received standard care following the Fragility Fracture Network treatment protocol. Predictive factors, including demographic data and laboratory results, were collected, while outcomes were assessed in terms of complications, 30-d, and 1-y mortality. Multivariate logistic regression analysis was carried out to identify independent risk factors. The predictive value of the model was calculated through ROC analysis.

Results: 88 patients were included, with mean age of 81.4 y and mean time from admission to surgery of 44.5 h. The 1-y mortality rate was 15.9%. Factors significantly associated with mortality included frailty, Charlson's comorbidity index, total lymphocyte count (TLC), monocyte to lymphocyte ratio, neutrophil to lymphocyte ratio, pre-operative hemoglobin, albumin, and the number of units of blood transfusion ($p < 0.1$). After multivariate analysis was performed, only frailty and TLC remained statistically significant, with a hazard ratio of 7.798 ($p = 0.002$, 95% CI 2.14–29.72) and 0.998 ($p = 0.025$, 95% CI 0.997–0.999), respectively, with area under the curve of 0.82 (95% CI 0.72–0.89).

Conclusion: Among all considered factors, frailty emerged as the most impactful determinant influencing 1-year mortality in elderly individuals with fragility hip fractures. The combination of frailty and TLC could provide good predictive value of 1-y mortality in EFHF.

P524
INTEGRATING OSTEOPOROSIS IN PRIMARY CARE: THE OSTEOPOROSIS RISK AND MANAGEMENT (ORMA) PROJECT

S. Vogrin[1], D. Navarro-Perez[1], A. Beauchamp[2], M. Grossman[3], P. Hamblin[1], J. Zanker[4], G. Duque[5]

[1]Australian Institute for Musculoskeletal Science (AIMSS), St. Albans, Australia, [2]School of Rural Health, Monash Univ., Melbourne, Australia, [3]Dept. of Medicine Austin Health, Melbourne Medical School, Univ. of Melbourne, Melbourne, Australia, [4]Australian Institute for Musculoskeletal Science (AIMSS), St. Albans, Canada, [5]Bone, Muscle & Geroscience Group. Research Institute of the McGill Univ. Health Centre, Montreal, Canada

Objective: Despite the availability of accurate diagnostic methods and very effective pharmacotherapy, osteoporosis remains significantly underdiagnosed and undertreated, particularly in primary care settings. The objective of the ORMA Project was to facilitate identifying and treating osteoporosis in primary care practices using innovative technology without demanding additional effort by health professionals.

Methods: The ORMA Project was a randomized stepped wedge study from September 2020 to January 2022. We implemented and evaluated a novel osteoporosis e-technology (Clinical Audit Tool (CAT)-Osteoporosis) which, after being integrated into medical software supports: 1. detection and management of osteoporosis and associated risk factors; 2. education for general practitioners (GPs) on osteoporosis; and, 3. assistance for GPs in the development of care plans. Sixteen primary care practices (125 GPs) were randomly assigned in a 1:1 ratio to the CAT-Osteoporosis + education (2-h teaching sessions) vs. education alone. Identification of risk factors, densitometries requests and treatment initiation data were collected from the software.

Results: A total of 11,326 participants were recruited. Participants' median age was 71 y (IQR 65, 78), 61% female and, on average, having 16 consultations within the last 24 months (IQR 4, 31). The rate of risk factor identification increased (at month 1 IRR 1.05 [1.02, 1.08], $p = 0.0009$ and at month 4 IRR 1.17 [1.13, 1.20], $p < 0.0001$) in the CAT-Osteoporosis group. At baseline, 13% had a record of BMD performed, 56% had vitamin D tested, and only 10% had both tests performed. Over the study period, the testing rate for BMD + vitamin D had an increase of up to 5% in the CAT-Osteoporosis group ($p = 0.045$). Treatment (medication + vitamin D) was received by 37% of participants with osteoporosis. The highest proportion of treatment was noted in a subgroup that had a formal diagnosis of osteoporosis and a record of minimal trauma fracture (around 50%, 203/477). In comparison, participants with a minimal trauma fracture and no history of osteoporosis had the smallest rate of treatment (~ 10%, 40/386). The study intervention showed no effect on treatment rates in either subgroup of participants.

Conclusion: Although the effectiveness of our intervention could have been affected by the COVID-19 pandemic, our e-technology effectively increased the identification of osteoporosis and the use of bone densitometries by primary care physicians. The reason for the lack of increase in osteoporosis treatment remains unknown and will be identified in future studies.

P525
IN-VIVO PRECISION OF TRABECULAR BONE SCORE VERSION 4.0 (TBS INSIGHT®) ACROSS MULTIPLE DXA DEVICES

G. Gatineau[1], K. Hind[2], D. Krueger[3], N. Binkley[3], B. Dawson-Hughes[4], E. Shevroja[1], D. Hans[1]

[1]Center of Bone Diseases, Rheumatology Unit, Bone and Joint Dept., Lausanne Univ. Hospital, & Univ. of Lausanne, Lausanne, Switzerland, [2]Medimaps group SA, Plan-Les-Ouates, Switzerland, [3]Osteoporosis Clinical Research Program, Univ. of Wisconsin-Madison, Madison, USA, [4]Bone Metabolism Laboratory, Jean Mayer USDA Human Nutrition Research Center on Aging, Tufts Univ., Boston, USA

Objective: TBS iNsight version 4.0 (v4) is the latest advancement in TBS software, assessing bone quality via DXA. It incorporates a soft tissue correction based on DXA-measured abdominal soft tissue thickness, diverging from the previous version (v3) which relied on BMI. This study evaluated the in vivo precision of TBS v4 across multiple DXA devices.

Methods: This study involved in vivo lumbar spine DXA scans derived from four different devices: GE Lunar Prodigy, GE Lunar iDXA, Hologic Discovery and Hologic Horizon, with 30 participants per device and 42 for Hologic Horizon. Participants received two consecutive scans with repositioning, and analysis was conducted using TBS iNsight v4.0. Precision was calculated as the root mean square coefficient of variation (RMS-CV%), least significant change (LSC) at 95% and root mean square standard deviation (RMS-SD). The minimum acceptable precision for TBS v4.0 was calculated from the upper 90 percentile RMS-CV%, based on the 2005 International Society for Clinical Densitometry official positions on minimum precision standards for DXA.

Results: Participant characteristics varied slightly across devices, with mean ages ranging from 60.7 (SD 8.9) to 72.2 (SD 9.6) y and BMI from 25.9 (SD 4.5) to 26.8 (SD 5.2). Measurement precision varied across devices: LSC was lowest for Hologic Discovery (3.64%) and highest for GE Prodigy (5.16%). TBS v4 average precision was 1.55% (LSC = 4.29%), and the minimum acceptable precision was 1.76% (LSC = 4.87%).

Table 1 Precision assessment of TBS v4 and abdominal soft tissue thickness across four different DXA devices.

	RMS CV%		LSC (95%)		RMS-SD
	TBS v4	Tissue Thickness	TBS v4	Tissue Thickness	TBS v4
GE Lunar Prodigy	1.86	1.35	5.16	3.75	0.025
GE Lunar iDXA	1.52	1.06	4.21	2.95	0.020
Hologic Discovery	1.31	0.87	3.64	2.42	0.017
Hologic Horizon	1.50	0.98	4.15	2.73	0.019
Average	1.55	1.06	4.29	2.96	0.020
Upper 90 percentile	1.76	1.26	-	-	-

Conclusion: This study confirms the reliability of TBS v4.0 across various DXA devices, with noted precision variations between devices. The global LSC derived from the upper 90 percentile of RMS CV% provides a conservative benchmark for clinicians and researchers interpreting TBS measurements, particularly for monitoring and follow-up of individuals.

P526
EFFECTIVENESS OF *LIMOSILACTOBACILLUS REUTERI* IN THE PREVENTION OF EARLY POSTMENOPAUSAL BONE LOSS: A RANDOMIZED PLACEBO-CONTROLLED SINGLE-CENTER CLINICAL TRIAL

G. Gregori[1], A. Pivodic[2], P. Magnusson[3], L. Johansson[4], U. Hjertonsson[1], E. Brättemark[1], M. Lorentzon[1]

[1]Univ. of Gothenburg, Dept. of Internal Medicine and Clinical Nutrition, Sahlgrenska Osteoporosis Centre, Gothenburg, [2]APNC, Gothenburg, [3]Univ. of Linköping, Dept. of Clinical Chemistry, Biomedical and Clinical Science, Linköping, [4]Sahlgrenska Univ. Hospital The Västra Götland Region, Dept. of Orthopedics, Mölndal, Sweden

Objective: Daily supplementation with *Limosilactobacillus reuteri* ATCC PTA 6475 (L.Reuteri) vs. placebo has previously been demonstrated to reduce bone loss in an estrogen deficiency mice model and older women, although the magnitude of the effect was small. We hypothesized that long-term treatment with L.Reuteri could result in clinically relevant skeletal benefits in postmenopausal osteoporosis. We aimed to evaluate if daily supplementation with L.Reuteri vs. placebo could reduce early postmenopausal bone loss and if the effects remained or increased over time during two years of treatment.

Methods: The study is a double-blind randomized placebo-controlled single centre clinical trial performed in Gothenburg, Southwestern Sweden. Participants: Recruited by online advertisements and letters which were sent to 10,062 women 50-60 years old. Women who responded (n = 752) underwent a first telephone screening process, resulting in 292 women who were invited to a screening visit. Of those screened, 239 women met all inclusion criteria and had no exclusion criteria. Interventions: Capsules with L.reuteri in two different doses, 5×10^8 or 5×10^9 colony-forming units (CFU), taken twice daily, or placebo. All capsules also included 200 IU of cholecalciferol. Main outcome measures: The primary outcome was the relative change in tibia total volumetric BMD (vBMD) over 2 y. Secondary outcomes included relative change in areal BMD of the spine and hip, bone turnover markers CTX and P1NP, as well as tibia trabecular bone volume fraction and cortical BMD.

Results: Tibia vBMD, hip and spine BMD and tibia cortical area and BMD declined significantly in all groups with no group-to-group differences. There were no significant treatment effects on any other predefined outcomes. A pre-specified sensitivity analysis found a significant interaction between BMI and treatment effect (Fig. 1).

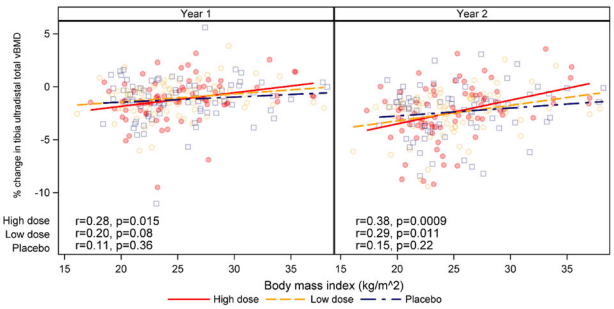


Figure 1. Pearson correlation between BMI and% change in tibia total vMBD by treatment group over time (ITT population).

Conclusion: Supplementation of L.Reuteri RCT did not affect bone loss or bone turnover in early postmenopausal women over two years. The observed interaction between BMI and treatment effect warrants further investigation.

P527
SINGLE-CELL TRANSCRIPTOMICS REVEALS THE HETEROGENEITY IN OSTEO-IMMUNE FUNCTIONS OF OSTEOPOROSIS

G. H. Kim[1], B. R. Keum[2], H. J. Kim[3], J. H. Shin[2], H. K. Chang[4], D. G. CHANG[3]

[1]Korea Basic Science Institute, Cheongju, [2]School of Medicine, Chungnam National Univ., Daejeon, [3]Inje Univ. Sanggye Paik Hospital, Seoul, [4]Korea Univ. Ansan Hospital, Seoul, South Korea

Objective: Although bisphosphonates (BPs) are frequently prescribed as an antiresorptive agents for osteoporosis, BP treatment failure rate can be high as 40%. The objective of this study was to describe the heterogeneity of immune system in osteoporosis patients with different BP-responses.

Methods: Three groups of postmenopausal women were recruited under the strict exclusion criteria: nonosteoporotic, osteoporosis that improved after BP treatment, and osteoporosis that did not improve after BP treatment. Peripheral immune cells were collected from the cohort, then single-cell RNA sequencing was performed. Proportions of immune cell subtypes, enriched cellular pathways, differentially expressed genes (DEGs), cell-cell networks were analyzed between cohorts.

Results: The populations and gene expression profiles of monocytes, T cells, NK cells, and B cells were different in patients with and without osteoporosis, and in patients for whom BP succeeded or failed. Osteoporotic condition retains an increased proportion of monocytes-to-lymphoid cells. Particularly, T-cell-receptor-expressing macrophages were enriched in osteoporosis patients. The NK cell population was expanded in the BP-failure group; this cell type is closely associated with stimulation of osteoclastogenesis. Moreover, subtypes of monocytes, lymphoid cells, and B cells showed differently enriched cellular pathways and DEGs which distinguishes three conditions. Cell-cell interaction analysis revealed the heterogeneity in outgoing and incoming signaling patterns in immune cell subtypes.

Conclusion: This study provides a microscopic atlas of postmenopausal osteoporosis, which will help us to better understand the role of immune heterogeneity in BP-failure. Moreover, this study can be useful source of information to develop potential diagnostic and therapeutic targets for preventing BP treatment failure.

P528
CENTRAL SENSITIZATION DURING OSTEOARTHRITIS AND ITS IMPACT ON PATIENT'S LIFE'S QUALITY IN A TUNISIAN POPULATION

G. H. Nahdi[1], F. Arfaoui[2], H. Ajlani[2]

[1]Faculty of Medicine of Tunis, Tunis, [2]Regional Hospital of Ben Arous, Ben Arous, Tunisia

Objective: Osteoarthritis is the most prevalent disease in the world, leading to disability and so economic burden. This is due to its chronic pain, generally recognized as nociceptive in origin because of the local pathology. However different studies and trials have shown that pain experience in OA is not stable and its quality is important to consider. The purpose of our study is to identify the type of pain among patients with osteoarthritis, thus we can improve pain management and reduce the resulting disability.

Methods: This is a descriptive cross-sectional study carried out over a period of 2 months (September–October 2023) in a rheumatology unit. 101 patients followed for osteoarthritis were included. Patients' data was obtained through a pre-established questionnaire associated with an exhaustive examination and a radiological assessment. Central sensitization inventory (CSI), Visual analog scale and DN4 were completed to type the pain experience. The SF-12 was also calculated to evaluate to life quality.

Results: There were 101 patients with mean age 57 y (24-88) and 85% were women. The most prevalent comorbidities were hypertension (32.7%) and diabetes (24.8%). The average duration of progression of osteoarthritis was 3.8 y. The different joints affected with osteoarthritis were lumbar spinal, cervical spinal and knee with respectively 62.4%, 49.5% and 40.6%.The half of the studied population had more than one joint affected. The totality of our patients was under medication: Nonsteroidal anti-inflammatory and paracetamol, physical rehabilitation was prescribed to 48.5%. Two patients only had corticoid infiltration. The VAS mean was 6.09 ($\pm$ 1.42SD). Central sensitization inventory was between 24–66 with mean a of 45.65 ($\pm$ 7.8SD). The SF12 mean score was 33 which is 70% of optimal. Patients with lumbar spinal osteoarthritis had the lowest SF12 scores. 79% had a CSI score $\geq$ 40, which means the presence of central sensitization. Among them, 20 patients were followed for lumbar spinal osteoarthritis, 15 for cervical spinal osteoarthritis and 9 for knee osteoarthritis. Thirty patients with CSI score $\geq$ 40 had 2 or more joints affected. The DN4 score was $\geq$ 4 in only 9 patients; testifying neuropathic pain. The interaction between CSI score and the VAS was significant, high VAS had central sensitization. Moreover we have found that the CSI score was significantly associated with the duration of progression of osteoarthritis (p-value = 0.001); patients with the longest duration had the highest CSI score. It was also associated with the number of joints affected (p-value = 0.001). The quality of life was associated with the central sensitization; patients having nociplastic pain had the lowest SF12 scores. However, there was no interaction between the CSI score and the osteoarthritis treatment.

Conclusion: In persons with osteoarthritis affecting different joints, any type of pain may exist. The central sensitization; indicator of nociplastic pain is not uncommon. It is associated with the number of joints affected, and the duration of osteoarthritis' progression. Our management of the OA must considerate these characteristics in order to relieve the patient's pain, improve his quality of life and prevent disability.

P529
OSTEOARTHRITIS AMONG HYPERTENSIVE PATIENTS IN A TUNISIAN POPULATION

G. H. Nahdi[1], F. Arfaoui[2], H. Ajlani[2]

[1]Faculty of Medicine of Tunis, Tunis, [2]Regional Hospital of Ben Arous, Ben Arous, Tunisia

High blood pressure may interfere with the pathogenesis of osteoarthritis (OA) since the final pathway of OA is perfusion abnormality of the synovium, articular cartilage and subchondral bone. That presupposes that high blood pressure as a vascular disease can change the OA course. This study was undertaken to assess the clinical and functional characteristics of osteoarthritis in hypertensive patients consulting in a rheumatology unit in Tunisia.

A total of 101 patients with osteoarthritis were included. Thirty-three (28 females, 5 males) had high blood pressure (HBP), 68 had not and were taken as controls. All participants had completed preliminary questionnaires, clinical examination and an X-ray exam. Scores were used for pain (visual analog scale VAS, central sensitization index CSI) and for the quality of life (SF-12).

The mean age of participants was 57.56 y [$\pm$ 13 SD]. The frequency of diabetes was 57.7% in HBP compared with 9% in controls. Forty-five percent (45%) of the HBP group and 55% of controls were workers. Hypertensive patients had higher VAS scores (VAS average = 6.7 $\pm$ 2.14) than the controls (VAS average = 4.8 $\pm$ 3.3). The prevalence of knee OA was higher in hypertensive patients than in

controls with 54.5% and 30% respectively. The central sensitization was found in 75% of both groups' patients. The hypertensive patients with OA had lower work ability index with poor work ability in 15% and moderate work ability 45% than controls with poor work ability in 10%. The quality of life was bad in HBP patients. All patients were under medication. There were significant associations of high blood pressure and knee osteoarthritis, VAS score, SF-12 ($p = 0.026$, $p = 0.004$ and $p = 0.016$ respectively).

High blood pressure is prevalent in patients with OA, especially knee OA and associated with worse pain, work ability score and impaired quality of life. Patients attending rheumatology unit for OA should have their BP taken, and those with known high blood pressure should have the co morbidity under control and well treated.

P530
SAFETY OF ANTI-OSTEOARTHRITIS MEDICATIONS: PRELIMINARY FINDINGS FROM A SYSTEMATIC REVIEW OF POST-MARKETING SAFETY SURVEILLANCE STUDIES

G. Honvo[1], L. Lengelé[2], J.-Y. Reginster[1,3,4], O. Bruyère[1,3]

[1]Division of Public Health, Epidemiology and Health Economics, Univ. of Liège, Liège, Belgium, [2]Metabolism and Nutrition Research Group, Louvain Drug Research Institute, UCLouvain, Université Catholique de Louvain, Sint-Lambrechts-Woluwe, Belgium, [3]World Health Organization (WHO) Collaborating Center for Epidemiology of Musculoskeletal Health and Ageing, Univ. of Liège, Liège, Belgium, [4]King Saud University (KSU), College of Science, Riyadh, Saudi Arabia

Objective: In 2019, we published a series of meta-analyses reassessing the safety of antiosteoarthritis (OA) drugs, using mainly data from full safety reports. The current systematic review (SR) intends to provide complementary insights on the safety of anti-OA medications, now using evidence from post-marketing safety surveillance studies.
Methods: This study followed the Cochrane methodology for SRs of interventions. Four bibliographic databases were comprehensively searched: Medline, CENTRAL, Scopus and TOXLINE. The outcomes of this review were any adverse events (AEs), or any safety issues reported in the included studies.
Results: Fifty-three (53) studies were retrieved, which assessed various anti-OA medications including non-steroidal anti-inflammatory drugs (NSAIDs, 22 studies), intra-articular hyaluronic acid (IAHA, 16 studies), symptomatic slow-acting drugs for osteoarthritis (SYSADOAs, 5 studies), Opioids (4 studies), Corticosteroid injections (4 studies), Nutritional supplements and herbal mixtures (2 studies). Most of these studies were cohort studies or case reports. The most common AEs reported by drugs were: Meloxicam (Gastrointestinal [GI] AEs), Celecoxib (Cardiovascular AEs), Nimesulide (GI, nervous system AEs), and Flurbiprofen (small increase in serum creatinine); other studies (1 per drug) reported mainly GI AEs with Piroxicam, Naproxen, Indoprofen, Sulindac, Etodolac, Fenbufen, Imidazole salicylate, Flavocoxid, and multiple NSAIDs; there was a case report of specific AEs with Etoricoxib (toxic epidermal necrolysis), Ibuprofen (delayed blood clotting with concomitant use of warfarin) and Diclofenac (spontaneous thigh hematoma). Other drugs and AEs were: IAHA (injection site pain); Diacerein (GI AEs and reddish urine); ASU-Piascledine (GI AEs—1 study); Combinations of non-pharmaceutical grade Glucosamine and Chondroitin (allergic reactions, musculoskeletal and GI disorders—2 studies); Opioids (hip fracture associated with long-term tramadol use among older adults and a case of anaphylaxis complicated by loss of consciousness; a case of topical erythematous reaction with a buprenorphine transdermal patch; and various GI and nervous system disorders with hydrocodone); Corticosteroid injections (increased risk of OA progression; a case of rare vision disturbances and of a septic arthritis); Nutritional supplements and herbal mixtures (GI AEs).
Conclusion: This very first SR of post-marketing surveillance studies in OA confirms previous evidence from SRs of phase 3 clinical trials. Real-life safety surveillance of anti-OA medications should be strengthened with large cohort studies and complementary data from adverse drug reaction report registries.

P531
THE FIT-FRAILTY APP FOR ASSESSMENTS OF FRAILTY IN OLDER ADULTS: RELIABILITY IN A GERIATRIC CLINIC

G. Ioannidis[1], A. Relan[2], C. C. Kennedy[1], S. Park[1], P. Fisher[3], S. Vinson[3], J. D. Adachi[1], K. Rockwood[4], B. Egbujie[5], A. Papaioannou[1]

[1]McMaster Univ./Dept. of Medicine, Hamilton, [2]McMaster Univ./Dept. of Health Research Methodology, Hamilton, [3]St. Peter's Hospital, Hamilton, [4]Dalhousie Univ./Dept. of Medicine, Halifax, [5]Univ. of Waterloo/School of Public Health Sciences, Waterloo, Canada

Objective: Frailty has been described as the most problematic expression of population aging. Assessing frailty with existing tools may be too time-consuming and require additional equipment and staff-time. The Fit-Frailty App is a comprehensive measure of frailty utilizing fully guided, interactive smartphone/tablet technology. It was designed to be easily completed with older adults in clinical/research settings in $\sim$ 15 min. Scoring is based on the well-validated Rockwood Frailty Index method and considers disease-related, physical, cognitive, mood, psychosocial, nutritional, and functional aspects. The full assessment includes interactive cognitive screening and physical performance measures. The primary aim is to conduct a reliability study of the Fit-Frailty App in older adults attending a geriatric clinic.
Methods: A convenience sample of 75 patients over the age of 65 y attending a geriatric clinic in Hamilton, ON were recruited. A clinic nurse administered the App with the patient during their clinic appointment and phone Fit-Frailty assessments were administered by a trainee 7 (follow-up 1) and 14 d (follow-up 2) after. The Fit-Frailty scores were categorized into severe frailty (> 0.4), frail (0.25–0.40), and not frail (< 0.25). Intraclass correlation coefficient (ICC) and 95% CI was calculated.
Results: The sample was 53% female, mean age 79.2 y (SD = 7.03) and SMMSE 23.8 (SD = 5.52). A total of 33% of participants were severely frail (25/75), 40% were frail (30/75), and 27% were not frail (20/75). The mean fit-frailty score was 0.33 (SD = 0.13) at in-person assessment, 0.30 (SD = 0.13) at phone follow-up 1 and 0.30 (SD = 0.11) at phone follow-up 2. The mean time to complete the virtual assessment was 13.7 min (SD = 8.4). The ICC between in-person and phone follow-up 1 was 0.840 (95% CI 0.830–0.853). The ICC between phone follow-up 1 and follow-up 2 was 0.911 (95% CI 0.911–0.912).
Conclusion: The Fit-Frailty App demonstrated excellent reliability when compared to in-person App assessment in measuring frailty in older adults attending a geriatric outpatient clinic. The Fit-Frailty App can assess home bound older adults, assist with triaging, and monitor changes over time.

P532
IMPORTANCE OF CALCIUM USE IN THE TREATMENT OF POSTMENOPAUSAL OSTEOPOROSIS

G. Kavaja[1], B. Kavaja[2], S. Tonuzi[1]

[1]Durres Regional Hospital, Durres, [2]Faculty of Medicine, Tirane, Albania

Objective: Osteoporosis is a progressive, systemic skeletal disorder characterized by reduced bone density. Patients with osteoporosis are at increased risk of fracture, although the condition remains asymptomatic until a fracture occurs. Oral bisphosphonates are generally considered the first-line treatment for patients with osteoporosis. It is important to ensure that patients with osteoporosis have adequate calcium and vitamin D levels for better results. We aimed to study the importance of using calcium as a supplement in bisphosphonate therapy in postmenopausal women with osteoporosis.
Methods: The study included 250 menopausal women diagnosed with osteoporosis. The diagnosis was made during the rheumatology visit and DXA examination. The first group included 150 female patients in menopause who were treated with oral bisphosphonate once a week and oral calcium 500 mg/d. The second group included 100 female patients in menopause who were treated with oral bisphosphonate once a week. In this group, the use of calcium was irregular due to the patients' compliance with it. The patients were followed for a period of 2 y by measuring the bone density every year.
Results: In the group of women in menopause treated with bisphosphonate and calcium, the prevention of bone loss was more significant compared to the second group where calcium intake was rare ($p < 0.05$). Mean changes in bone density were [± SE], for the spine $0.56 \pm 0.94\%$ vs. $-1.06 \pm 0.88\%$ and for the femoral neck $1.04 \pm 0.82\%$ vs. $-1.94 \pm 0.77\%$.
Conclusion: Treatment with bisphosphonate and calcium was more effective than treatment with bisphosphonate alone. The use of calcium slowed the bone loss in the femoral neck and spine in women in menopause.

P533
OBSERVATIONAL STUDY ON BONE QUALITY BY EVALUATION OF "BONE STRAIN INDEX" IN MALE AND FEMALE PATIENTS AFFECTED BY OSTEOGENESIS IMPERFECTA

G. Marcucci[1], F. Miglietta[1], C. Signorini[1], M. L. Brandi[2], L. Masi[3]

[1]Dept. of Experimental and Clinical Biomedical Sciences, Univ. of Florence, [2]FIRMO Foundation Onlus, Italian Foundation for Research on Bone Diseases, [3]Bone Unit, Univ. Hospital of Florence, CTO-Careggi, Florence, Italy

Objective: Osteogenesis Imperfecta (OI) is a group of connective tissue disorders with a broad range of phenotypes characterized primarily by bone fragility. Recently, a new densitometric index of "Bone Strength" has been introduced, which provides information on skeletal resistance to loads, called "Bone Strain Index" (BSI). The aim of the study was to evaluate the BSI in patients affected by OI and to correlate this index to BMD, T- and Z-score, measured by DXA, in male and female patients.
Methods: An observational, retrospective, single-center study was conducted on patients with OI. The statistical analyzes used include: descriptive statistical analyses, Pearson correlation coefficient, and t-test.
Results: 46 patients affected by OI were enrolled (females: 29/46; males: 17/46) with an average age of 37.7 ± 20.4 years. The lumbar BSI (L1–L4) was ≥ 2.4 (reduced Bone Strength) in 41.3% of patients (n: 19/46), > 1.68– < 2.4 (partially reduced) in 45.6% (n:21/46), and ≤ 1.68 (normal) in 13% (n: 6/46). Femoral neck BSI was ≥ 2.4 in 16.6% of patients (n: 6/36), > 1.68– < 2.4 in 50% (n: 18/36), and ≤ 1.68 in 33.3% (n:12/36). L1–L4 BSI negatively correlates with L1-L4 BMD (r: -0.63, $p < 0.001$), Z-score (r: -0.52, p:0.003), and T-score (r: -0.91, $p < 0.0001$). Femoral neck BSI negatively correlates with femoral neck BMD (r: -0.51, p: 0.001), and T-score (r: -0.90, $p < 0.001$). In females, lumbar BSI was ≥ 2.4 in 10.34% (3/29), > 1.68 to < 2.4 in 51.72% (15/29), and ≤ 1.68 in 37.93% (11/29). In males, lumbar BSI was ≥ 2.4 in 23.5% (4/17), > 1.68 to < 2.4 in 35.29% (6/17), and ≤ 1.68 in 41.17% (7/17). In females, femoral neck BSI was ≥ 2.4 in 25% (n: 6/24), > 1.68 to < 2.4 in 54.16% (n:13/24), and ≤ 1.68 in 20.83% (n:5/ 24). In males, femoral neck BSI was ≥ 2.4 in 40% of patients (n: 6/15), > 1.68 to < 2.4 in 46.66% (n:7/15), and ≤ 1.68 in 13.33% (n:2/ 15).
Conclusion: In the majority of patients, the BSI index was reduced or partially reduced and negatively correlated significantly with the BMD, T- and/or T-score. These preliminary results are essential for further studies on BSI in patients affected by OI, and correlations with clinical data, fractures, other bone quality parameters and response to therapies.
Acknowledgment: ENDO-BOND-ERN.

P534
OBSERVATIONAL STUDY ON BONE MINERAL DENSITY, TRABECULAR BONE SCORE AND BIOIMPEDANCE IN PATIENTS AFFECTED BY ANOREXIA NERVOSA

G. Marcucci[1], C. Dani[2], L. Cianferotti[1], C. Signorini[1], E. Rossi[2], E. Cassioli[2], A. I. Altomare[2], E. Borri[2], A. De Martino[2], F. Cioppi[3], L. Vannucci[3], G. Castellini[2], V. Ricca[2], L. Masi[3]

[1]Dept. of Experimental and Clinical Biomedical Sciences, Univ. of Florence, [2]Psychiatry Unit, Dept. of Health Sciences, Univ. of Florence, [3]Bone Unit, Univ. Hospital of Florence, CTO-Careggi, Florence, Italy

Objective: Anorexia nervosa (AN) is often associated with reduced BMD and increased fracture risk. The aim of the study was the evaluation and correlation between BMD, TBS and bioelectrical impedance analysis (BIA).
Methods: An observational, retrospective, single-center study was conducted on patients with AN. Evaluation of risk factors for bone fragility, laboratory exams of bone metabolism, BMD and TBS measured by DXA, and bioimpedance analysis were performed. Statistical analyzes used included: Pearson correlation coefficient, age-corrected correlations, and ANOVA (Bonferroni post hoc test).
Results: 85 female patients (mean age: 25.39 ± 10.19 y) with AN, and mean BMI of 15.47 ± 1.38 kg/m^2 were enrolled. The mean disease duration was 8.7 ± 11.3 y. The mean BMD L1–L4 values were 0.870 ± 0.13 g/cm^2 with Z-score -1.46 ± 1.21, neck femur BMD 0.750 ± 1.44 g/cm^2 with Z-score -1 ± 1.16, and total femur BMD 0.820 ± 0.91 g/cm^2 with Z-score -1.4 ± 0.8. The Z-score was < -2 in 34.6% of patients at the lumbar level and in 18.6% at the femoral neck. Mineral metabolism tests showed normal parameters, with the exception of mean 25(OH)D_3 levels slightly below the normal range (29.6 ± 10.9 ng/ml). In a subgroup of 35 patients, TBS and bioimpedance measurement were performed. The study showed a significant correlation between free fat mass (FFM) and lumbar BMD (r: + 0.33, p: 0.04), femoral neck BMD (r: + 0.38, p:0.017), femoral neck Z-score (r: + 0.41, p:0.011). Mean value of TBS was 1313 ± 1197 (min: 1197; max: 1469). The 62.85% of patients (22/35) had TBS partially degraded, and the remainder were normal. The TBS score correlated positively with lumbar and femoral BMD and Z-scores measured with DXA and FFM in a statistically significant manner.

Conclusion: The significant positive correlation between FFM, TBS and DXA described represent important results for further correlation studies between these parameters, measured with widely used methods, in order to evaluate FFM as a predictive risk factor for reduction of low bone mass and altered bone quality in affected patients from AN.

P535
UNVEILING CHALLENGES: HIGH MORTALITY AND DISABILITY IN OSTEOPOROTIC PATIENTS WITH HIP FRACTURE IN A BRAZILIAN TERTIARY SETTING: A 1-YEAR FOLLOW-UP STUDY

G. Pacífico Seabra Nunes[1], H. Neneve Prohmann[1], J. Alícia Silveira Lopes[1], L. Vicentini Godoy de Lucca[1], B. Fernandes Boaventura[1], P. De Oliveira Barbalho Junior[1], E. De Azevedo[1]

[1]IAMSPE, São Paulo, Brazil

Objective: To evaluate the profile of patients who had a hip fracture in the period of 2021 and 2022, and one-year follow-up to assess the degree of mortality, disability and treatment of osteoporosis.
Methods: Retrospective study based on medical records and phone inquiry of one year follow up regarding mortality and morbidity of patients who experienced hip fracture in 2021 and 2022 in a tertiary hospital of São Paulo.
Results: 138 patients were hospitalized due to hip fracture in the period. The median age was 83 y (range, 50–101 y), most of them were female (71.7%). All the patients underwent surgical treatment, except one that died before treatment. 45 (32.6%) patients died within one year after fracture. Fourteen patients died during the hospitalization, 9 caused by infections and 5 by pulmonary embolism. 63% of the remaining alive patients had some sort of disability after one year of fracture; 36 (38.7%) had to use walking stick, 18 (19.3%) were in a wheelchair and 5 (5.3%) were bedridden. 57 (61.3%) patients claimed that they were not informed that they had the diagnosis of osteoporosis. From the total patients, only 31 (22.4%) patients were referred for osteoporosis treatment. Bisphosphonates were the main treatment used in this population.
Conclusion: In the study population we can identify that the median population age and mortality is higher than the other studies. These differences may be interrelated. As expected, the degree of disability at the end of the first post-fracture year was also high (approximately 65% of the patients). High mortality, high disability rates and little knowledge about the disease highlight the great burden of osteoporosis.

P536
BREAKING THE SILENCE ON OSTEOPOROSIS TREATMENT: A DEEP DIVE INTO A SÃO PAULO'S TERTIARY HOSPITAL EXTREME ELDERLY POPULATION

B. Fernandes Boaventura[1], G. Pacífico Seabra Nunes[1], P. De Oliveira Barbalho Junior[1], E. De Azevedo[1]

[1]IAMSPE, São Paulo, Brazil

Objective: To outline the clinical and treatment profile of osteoporosis in individuals above 85 years old in a tertiary hospital in São Paulo.
Methods: Data collection and retrospective analysis of electronic medical records from a sample of 100 patients above 85 years old, under follow-up in a specialized rheumatology outpatient clinic of a tertiary service in São Paulo in 2022–2023.
Results: Among the evaluated patients, 89% were women. Regarding the clinical profile, only 2% had one comorbidity; 49% had two to four, and 49% had five or more. These values correlate with polypharmacy, with only 3% of patients using up to 3 medications; 49% using four to eight, and 52% using nine or more continuous medications. A history of osteoporotic fracture was present in 76%, ranging from one to six affected sites, with 29% having a fracture at a single site, 39% at two sites, and 8% at three sites. The majority used bisphosphonates as first-line treatment (90%). Of these, 80% had an indication for sequential therapy. Denosumab was indicated in 41%, mainly due to prolonged use of bisphosphonates and renal dysfunction. Replacement with Teriparatide occurred in 40.28% and was also motivated by duration of use or therapeutic failure. After the anabolic cycle, the transition to denosumab was observed in 44% and to bisphosphonates in 13%.
Conclusion: Osteoporosis in the extremely elderly poses a significant challenge, given the increasing incidence of osteoporotic fractures with age, impacting morbidity and mortality. Understanding and Treating osteoporosis in this population is crucial given the high risks, and the beneficial impact that the therapy causes.

P537
GDNF LIGANDS AND RET: IMPLICATIONS FOR FUNCTIONALITY OF GROWTH CARTILAGE

G. Palmini[1], C. Aurilia[2], S. Donati[2], I. Falsetti[2], F. Marini[1], F. Giusti[3], R. Zonefrati[1], G. Galli[2], L. Funaro[4], R. Civinini[5], T. Iantomasi[2], F. Tonelli[1], G. Picchioni[4], M. L. Brandi[6]

[1]Fondazione Italiana Ricerca sulle Malattie dell'Osso (F.I.R.M.O Onlus), [2]Dept. of Experimental Clinical and Biomedical Sciences, Univ. of Florence, [3]Dept. of Experimental Clinical and Biomedical Science, Univ. of Florence; Donatello Bone Clinic, Villa Donatello, Sesto Fiorentino, [4]Stabilimento Chimico Farmaceutico Militare (SCFM)_Agenzia Industrie Difesa (AID), [5]SOD Ostopedia, AOU Careggi, Univ. of Florence, [6]Fondazione Italiana Ricerca sulle Malattie dell'Osso (F.I.R.M.O Onlus); Donatello Bone Clinic, Villa Donatello, Sesto Fiorentino, Florence, Italy

Objective: Very few is still known about RET role in the pathophysiology of the marfanoid habitus affecting MEN2B patients. Aim of this study is evaluating the presence of RET in a cell model of human growth plate, to investigate RET role in MEN2B marfanoid habitus.
Methods: A biopsy of growth plate has been collected and treated to establish a primary cell line of hypertrophic chondrocytes. Specific cellular and molecular biology analyses were performed to confirm the phenotype of hypertrophic chondrocytes before studying the possible effects of RET ligand (i.e., GDNFRa1 and GDNFRa2) treatment, at several concentrations (i.e., 100 nM, 50 nM, 25 nM and 10 nM), on cell proliferation, and on osteogenic and chondrogenic differentiation. GDNFra1 and GDNFRa2 effects have been evaluated by using immunohistochemical assays, fluorometric assay and Taq-Man technology.
Results: We have established a primary cell line of human hypertrophic chondrocytes, marked as GP-1. GP-1 line expressed all the hypertrophic cartilage marker genes, had the capacity to differentiate in osteoblasts or chondrocytes, under specific differentiation conditions, maintaining the expression of RET mRNA and protein, respect to a primary cell line of differentiated articular cartilaginous cell line. Regarding the effects of GDNF ligands on osteogenic differentiation we showed not only an increase of alkaline phosphatase activity and of hydroxyapatite deposition, but also an increment of chondrogenic differentiation potential under treatment with GDFRa1 and GDFRa2, respectively. It has been noticed that both these treatments positive regulate expression levels of osteogenic and chondrogenic marker genes during both differentiation processes. Finally, we reported an increase of the proliferation rate for both GDNF ligand treatments.

Conclusion: Our research established a human hypertrophic chondrocyte cell line characterized by the presence of RET protein, setting up the first in vitro human model to study RET pathway in the cartilage. Our data suggested that GDNF ligands and RET are significantly associated with the functionality of hypertrophic chondrocytes, opening the possibility that RET is directly involved in the clinical manifestation of the marfanoid habitus in MEN2B patients.

P538
PREVALENCE AND POPULATION ATTRIBUTABLE FRACTION OF ASSOCIATED RISK FACTORS ON SARCOPENIA: IRANIAN MULTICENTER OSTEOPOROSIS STUDY (IMOS-2021)

A. Ghazbani[1], G. Shafiee[1], A. Aghakhani[2], N. Fahimfar[3], A. Ostovar[3], R. Heshmat[1]

[1]Chronic Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, [2]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [3]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: As an important musculoskeletal disease, sarcopenia is characterized by the degeneration of both muscle mass and functionality. Recognizing the growing importance of musculoskeletal disorders within the Iranian population, the current investigation was undertaken to address a knowledge gap in the existing literature by measuring the prevalence and population-attributable fraction (PAF) of established risk factors for sarcopenia in Iran using data from the Iranian Multicenter Osteoporosis Study (IMOS-2021).
Methods: IMOS was a population-based, cross-sectional survey that was conducted in Iran to estimate the prevalence of osteoporosis, osteopenia, and sarcopenia and their possible related risk factors among people over 50 y of age in Iran. Sarcopenia was defined by the presence of low muscle mass with low muscle strength, and severe sarcopenia was considered when low muscle strength, low muscle mass, and low physical performance were all detected. The survey set analysis was carried out using the STATA statistical software, to determine the weighted prevalence of sarcopenia among adults in Iran. Using modified Poisson regression analysis, an adjusted prevalence ratio (PR) with 95% CI was used to show the measure of associations in the final model. To calculate the PAF of established risk factors for sarcopenia, the complex survey design was taken into consideration, along with the incorporation of sampling weights.
Results: In the present study, 716 participants $\geq$ 60 y were included. The mean subjects' age was 66.8 $\pm$ 6.1 y and 51.4% of those were women. The weighted prevalence of sarcopenia (including sarcopenia and severe sarcopenia) was estimated to be 13.8% (11.1–17.0%). There was a significant increasing trend in the prevalence of sarcopenia with advancing age (p for trend = 0.001). The results of the Poisson regression analysis revealed that high-fat mass was positively associated with sarcopenia (PR: 2.09, 95% CI 1.33–3.28). Age $\geq$ 75 y had a positive association with sarcopenia (PR: 1.72, 95% CI 1.10–2.70). Subsequently, low physical activity emerged as another significant factor, with a prevalence ratio of 1.64 (95% CI 1.04–2.60). In addition, the direct associations were detected with low BMI (PR: 6.69, 95% CI 2.78–16.12) and low protein intake (PR: 1.66, 95% CI 1.01–2.75) and having sarcopenia. The attributable risks of advancing age (> 75 y), low BMI (BMI, 25 kg/m^2), low protein intake, low physical activity, and high-fat mass were as follows: 17.3%, 19.7%, 23.8%, 28.8% and 40.7% for sarcopenia. However, most of the PAF was due to high-fat mass, the combination of the PAF of these risk factors accounted for 78.6% of sarcopenic subjects.
Conclusion: Our finding demonstrated a high prevalence for sarcopenia suggesting a high disease burden in a rapidly aging country. Also, these data confirm that high fat mass, low physical activity, and low protein intake are major risk factors for sarcopenia. Therefore, implementing effective prevention programs that specifically target these factors has the potential to significantly reduce the occurrence of sarcopenia in Iran.

P539
RELATIONSHIP BETWEEN DYSMOBILITY SYNDROME AND MALNUTRITION WITH THE RISK OF MORTALITY IN OLDER PEOPLE: THE BUSHEHR ELDERLY HEALTH (BEH) PROGRAM

G. Shafiee[1], F. Abbasloo[2], H. R. Aghaei Meybodi[3], N. Fahimfar[4], A. Ostovar[4], S. Maleki Birjandi[1], I. Nabipour[5], R. Heshmat[1]

[1]Chronic Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [2]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [3]Evidence-Based Medicine Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [4]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran[5]The Persian Gulf Tropical Medicine Research Center, Bushehr Univ. of Medical Sciences, Bushehr, Iran

Objective: Dysmobility syndrome and malnutrition are highly prevalent in older adults and are associated with adverse outcomes. This study aimed to evaluate the role of a combination of dysmobility syndrome and malnutrition on the mortality rate in a cohort of older adults in Iran.
Methods: The BEH program is a prospective population-based cohort study, which aims to investigate the incidence of non-communicable diseases and their risk factors among people over 60 years old in Bushehr, Iran. Dysmobility was defined as three or more of the following: high body fat, osteoporosis, low muscle mass, low muscle strength, slow gait speed, or falling history. Body composition was assessed with DXA. Gait speed was measured via a timed walk, muscle strength via hand grip strength, and fall risk via self-reported balance problems in the past year. Nutritional status was determined with a). The participants were divided into six groups: No dysmobility/normal nutrition, No dysmobility/malnutrition risk, No dysmobility/malnutrition, dysmobility/normal nutrition, dysmobility/malnutrition risk, and dysmobility/malnutrition. Hazards ratios (HR) for mortality were calculated with Cox proportional hazards models.
Results: The study included 2123 participants: 660 had no dysmobility/normal nutrition, 932 had dysmobility/normal nutrition, 263 had dysmobility/malnutrition risk, and 151 had dysmobility/malnutrition. Over 7 y of follow-up, there were 355(14.6%) deaths, and the Kaplan-Meier curves showed that dysmobility/malnutrition had a higher risk of mortality. The incidence rates of mortality were 11.62, 16.06, 9.00, 20.88, 32.40, and 36.55 per 100 person-years among patients with no dysmobility/normal nutrition, no dysmobility/malnutrition risk, no dysmobility/malnutrition, dysmobility/normal nutrition, dysmobility/malnutrition risk, and dysmobility/malnutrition, respectively. In the survival analysis, the group with dysmobility and malnutrition showed a higher HR of 2.90 (95% CI 185-4.55) for mortality when compared to a group with no dysmobility/normal nutrition in all models.
Conclusion: Older adults with dysmobility and malnutrition combined showed higher mortality risk. These findings highlight the

importance of diagnosing and treating malnutrition and dysmobility in older people for both can increase mortality rate.

P540
ASSOCIATION OF VITAMIN B6 AND KYNURENINE PATHWAY WITH SARCOPENIA, METABOLOMIC APPROACH: RESULTS OF BUSHEHR ELDERLY HEALTH (BEH) PROGRAM

G. Shafiee[1], N. Zargar Balajam[1], H. A. Mardani-Fard[2], N. Fahimfar[3], F. Razi[4], A. Etemadi[5], A. Kasaeian[5], F. Bandarian[4], A. Ostovar[3], R. Heshmat[1]

[1]Chronic Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [2]Dept. of Mathematics, Yasouj Univ., Yasouj, [3]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [4]Metabolomics and Genomics Research Center, Endocrinology and Metabolism Molecular-Cellular Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [5]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Sarcopenia, the age-related decline in muscle mass and function, poses a significant health challenge. The intricate molecular mechanisms underlying age-related muscle mass decline are not yet fully understood. The present study aimed to investigate the impact of tryptophan (Trp), downstream kynurenine metabolites, and Vitamin B_6 as a coenzyme in this pathway on sarcopenia in older people.
Methods: Data was randomly extracted from 2426 elderly people $\geq$ 60 y participating in the second stage of the BEH program, a population-based prospective cohort study in Bushehr, Iran. Anthropometric measurements, performance and muscle strength tests, blood pressure, and body composition measurements were performed, and venous blood was taken from participants after 12 h of fasting. Frozen plasma samples measured kynurenine- tryptophan metabolites and vitamin B6- metabolomics. Metabolites were analyzed using tandem mass spectrometry. Data processing included replacing zero values with half the minimum value and missing values with mode. We conducted the lasso regression analysis to detect the strongest metabolites associated with sarcopenia and also logistic regression models were used to calculate crude and adjusted odds ratios (ORs).
Results: A total of 400 participants were included in this study. We adjusted the analysis for possible confounders including; sex, age, BMI, diabetes, smoking, physical activity, and vitamin B group intake. The Lasso model showed effective metabolites on the occurrence of sarcopenia. 3-hydroxykynurenine, anthranilic acid, xanthurenic acid, pyridoxal 5-phosphate (the active form of vitamin B6), nicotinamide, and 3-hydroxyanthranilic acid had the most relationship with sarcopenia and its parameters, respectively. Our results showed that in the full model, Xanthurenic acid, and anthranilic acid were positively associated with sarcopenia, and pyridoxal 5-phosphate and Picolinic acid were inversely associated with sarcopenia ($P < 0.05$).
Conclusion: Our investigation reveals compelling associations between the Trp and vitamin B6 metabolites with sarcopenia. These findings may pave the way for innovative approaches to prevent or treat this disease**,** ultimately enhancing the quality of life for the elderly. Further research in this area is warranted to elucidate the underlying mechanisms and develop targeted interventions.

P541
CLINICAL PRACTICE GUIDELINES FOR SARCOPENIA PREVENTION, DIAGNOSIS AND MANAGEMENT IN IRAN

G. Shafiee[1], N. Zargar Balajam[2], F. Abbaspour[1], S. Maleki Birjandi[1], R. Heshmat[1]

[1]Chronic Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, [2]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Sarcopenia, as an age-related progressive loss of muscle mass and muscle strength, is one of the most important topics of elderly medicine that occurs in approximately 37% of hospitalized older adults aged > 65 y. Therefore, the existence of a comprehensive guideline for the prevention, diagnosis, or possible treatment of this disease is vital and practical. There is no comprehensive guideline about this disease in Iran, so the purpose of this article is to provide the most effective evidence-based clinical practice guidelines (CPGs) for screening, diagnosis, management of sarcopenia, and formulation of monitoring policies in the elderly.
Methods: This guideline for sarcopenia in Iran was developed based on various existing guidelines from different societies, such as the Foundation for the National Institutes of Health (FNIH), International Clinical Practice Guidelines for Sarcopenia (ICFSR), European Working Group on Sarcopenia in Older People (EWGSOP/ EWGSOP2), Asian Working Group for Sarcopenia (AWGS) as well as two the Australian and New Zealand society for sarcopenia and frailty research (ANZSSFR) expert working group. All studies in national and international journals by Iranian authors in the field of sarcopenia from the inception until the start of 2024 were included in this comprehensive study. Databases including MEDLINE (PubMed), Web of Science, and SCOPUS were used as sources of information.
Results: The final guideline of sarcopenia in Iran was made by answering questions about screening, diagnosis, prevention, and treatment of this disease. These questions were answered according to the existing guidelines, a model called the Sarcopenia Screening Assessment Model (SarSA Mod) designed in Iran, and the available clinical evidence directly from the patients, which included the following: (I) Who should be screened for sarcopenia? (II) How to find people at risk of sarcopenia? (III) How to diagnose the possibility of sarcopenia? (IV) What is the definitive diagnosis of sarcopenia? (V) What is the basis of the prevention and treatment of sarcopenia? (VI) What is the role of nutrition in the prevention and treatment of sarcopenia? (VII) What is the role of drug interventions in the prevention and treatment of sarcopenia?
Conclusion: Here we present the sarcopenia guideline for the Iranian community, emphasizing the need for improved clinical trial quality. Although these guidelines are based on available studies and articles as well as data obtained from patients to make better decisions about sarcopenia, their applicability may vary across different settings and patient populations. By incorporating additional parameters and removing restrictions, more comprehensive models can be developed and implemented to address this condition effectively.

P542
ALTERATIONS IN BONE HEALTH IN TRANSGENDER ADOLESCENTS AND ADULTS RECEIVING GENDER AFFIRMATION HORMONAL THERAPY AND/OR SEX REASSIGNMENT SURGERY: SCOPING REVIEW

G.-A. Cruz-Priego[1], A. Gonzalez-Miranda[1], M.-A. Guagnelli[1], J.-L. Neyro[2], P. Clark[1]

[1]Clinical Epidemiology Research Unit, Hospital Infantil de Mexico Federico Gomez, Mexico City, Mexico, [2]Servicio de Ginecología y Obstetricia, Hospital Universitario Cruces. International Master on Climacteric. Univ. of Madrid (UDIMA), Bilbao, Spain

Objective: This scoping review aims to consolidate current evidence on bone health alterations in transgender adolescents and adults receiving gender-affirming hormonal treatments (GAHT).
Methods: A comprehensive literature review was conducted across various digital libraries, encompassing all cultures, geographies, races, and genders. This review was unrestricted by language or publication year and focused on transgender adolescents and adults who received aGnRH therapy, gender affirmation therapy, or sex reassignment surgery. The primary focus was on alterations in bone metabolism, specifically BMD and bone marker changes. The review included secondary and tertiary evidence, such as systematic reviews, overviews, umbrella reviews, and international guidelines.
Results: From 991 studies identified, 38 were included: 4 systematic reviews, 1 randomized controlled trial (RCT), 1 quasi-experimental study, 7 longitudinal studies, 9 cross-sectional, and 16 narrative reviews. Systematic reviews revealed inconsistent findings on bone density in male-to-female (MtF) and female-to-male (FtM) transgender patients undergoing long-term hormone therapy. While some studies reported BMD comparable or higher than controls, others noted reduced BMD in MtF patients, with no similar reduction in FtM patients. The limited number and quality of RCTs and quasi-experimental studies impede conclusive evidence. Longitudinal studies displayed variable, sometimes contradictory results, particularly in adult bone density measurements and turnover markers. Adolescent studies also showed varied outcomes, underscoring the need for long-term research. Cross-sectional studies, limited by design, provided baseline data with similar trends in adults and adolescents.

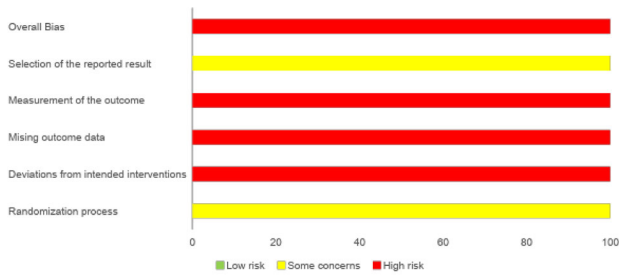


Figure 1. Risk of bias from randomized clinical trials.

Conclusion: Current research is insufficient for a comprehensive understanding of GAHT's bone effects in transgender individuals. High-quality, long-duration prospective studies are necessary for reliable conclusions. There is a critical need for more robust data to inform health professionals in decision-making regarding gender affirmation treatments.

P543
PREDICTIVE CAPACITY OF FRACTURE RISK ASSESSMENT TOOLS: OVERVIEW OF SYSTEMATIC REVIEWS

G.-A. Cruz-Priego[1], B. Araiza-Nava[1], L. Mendez-Sánchez[1], P. Clark[1]

[1]Clinical Epidemiology Research Unit, Hospital Infantil de Mexico Federico Gomez, Mexico City, Mexico

Objective: To conduct an overview of systematic reviews of the current fracture risk prediction tools in use.
Methods: We included systematic reviews (SRs) that assessed the predictive ability of any tool, score, algorithm, or other instrument for fracture risk. The primary outcome measure was the area under the curve (AUC) representing predicted fracture risk within a specified timeframe obtained from receiver operating characteristic (ROC) analysis. We included SRs that studied both men and women with fractures in the general adult population.
Results: The review identified 26 different tools currently in use to predict fracture risk. Within these tools a total, 21,717 different prediction variables were found. Among the different tools, a different number of factors were used ranging from the BWC model that used a single predictor variable to the GSOS tool that incorporated 21,717 predictor variables in its model (including many individual SNPs). Regarding the performance of the tools, AUC ranging from 0.60–0.89. None of the models had a prediction capacity $> 90\%$. Most of the models are within the range of 0.7–0.75, but it cannot be said that any specific one stands out over the others. Rather, a fluctuating behavior is observed in all models within the different studies. The discrimination of the two most frequently validated models, including FRAX with and without BMD, varied among the studies with AUC/C index ranging from 0.55–0.90, respectively. Other commonly validated model, including the Garvan Model showed AUC between 0.57–0.84.
Conclusion: The vast majority of the models performance is within the range of 0.7–0.75. To compare the performance of different tools when predicting fracture, it is very important to consider the differences between prediction tools, the number of risk factors considered, as well as the nature of the variables as they will have an important impact on the feasibility of its use in clinical practice. Likewise, differences in the prediction results may depend on sex, age, types of fractures, as well as the temporal intervals of the prediction and could affect the use of the tools in the daily clinical routine.

P544
TENOFOVIR-INDUCED PHOSPHOPENIC OSTEOMALACIA: A CLINICAL CASE REPORT

H. Bagirova[1], P. Khandaeva[1], E. Przhiayalkovskaya[1], Z. Belaya[1]

[1]Endocrinology Research Centre, Moscow, Russia

HIV infection is a known cause of secondary osteoporosis and bone fragility. However the exact mechanism of bone complications in these patients remains the subject of research. Long-term use of tenofovir, a HIV nucleoside reverse transcriptase inhibitor, may cause osteomalacia in HIV patients.

Case report: a 49-year-old woman was referred to our clinic with a 10-month history of progressive, immobilizing pain involving the back, hips and ankles. The pain was exacerbated by physical activity and she needed a cane for walking. She had been diagnosed with a HIV 7 years previously and had been taking a combination of antiretroviral drugs including tenofovir, lamivudine and dolutegravir. The laboratory revealed severely impaired renal function and proteinuria (0.25 g/L). Serum phosphate was low (0.66 mmol/L) and alkaline phosphatase was high (340 U/L), while 25-OH vitamin D

(68.4 ng/mL) and PTH were normal. Tubular reabsorption of phosphate was 93%. Lateral radiographs of the thoracic and lumbar spine confirmed vertebral fractures at L2–3 (27–29% vertebral body height loss) and vertebral deformities at Th6-8,12. DXA showed severe BMD loss at the femoral neck (− 3.6 SD) and at the lumbar spine (− 2.6 SD) and 33% radius (− 3.4 SD). We diagnosed phosphopenic osteomalacia due to tenofovir use. Tenofovir was replaced by abacavir, treatment with alfacalcidol was initiated, and there was a rapid improvement in symptoms. The bone pain disappeared within a few weeks. The patient was able to walk unaided after 3 months. After stopping tenofovir, serum phosphate and alkaline phosphatase normalized and renal function improved.

Conclusion: Tenofovir treatment may add significantly to the musculoskeletal complications of HIV patients due to the development of phosphopenic osteomalacia. HIV treatment should be reanalysed in case of detected bone fragility or physical performance deterioration.

P545
ASSESSMENT OF OSTEOPOROSIS AWARENESS AMONG TUNISIAN WOMEN

H. Ben Ayed[1], H. Bettaieb[1], M. Boudokhane[1], R. Bourguiba[1], W. Helali[1], M. H. Dougui[1], S. Belakhal[1]

[1]Dept. of Internal Medicine, Internal Security Forces Hospital, La Marsa, Tunisia

Objective: Osteoporosis (OP) ranks as the second most significant healthcare challenge globally, after cardiovascular disease (1). We aimed to assess the level of knowledge of Tunisian women on osteoporosis.

Methods: We conducted a cross-sectional descriptive study among Tunisian women. Participants were invited to answer an anonymous web-based questionnaire composed of 22 questions. Female healthcare workers were excluded from the study. The data were analyzed with descriptive statistics using the SPSS statistical package.

Results: A total of 53 women, with a mean age of 54.4 ± 13.1 y, responded to the questionnaire. 32 (60%) participants pursued higher education at college. 36 (67.9%) of them were postmenopausal. Overall, 72% of them (n = 38) regarded their knowledge level of osteoporosis as good. Their information sources were as follows: social circle (n = 34), family doctor (n = 13) and media (n = 7). Only 20% (n = 11) of participants have had a DXA scan at least once in their lifetime. The test was recommended by a doctor in ten patients, mainly a rheumatologist (n = 6). Regarding the definition of OP, 47% (n = 25) and 23% (n = 13) of participants wrongly identified this disease as a lack of calcium in bone and as bone inflammation disease, respectively. Participants correctly identified these risk factors of OP: dietary calcium deficiency (n = 34), long-term corticosteroids therapy (n = 21) and positive family history of OP (n = 15). Overall, 40% (n = 21) of women were aware that OP leads to an increased risk of bone fracture. In regards to the management of OP, only 13.2% (n = 7) of women recognized that bisphosphonates are effective treatments for this disease, while 62.2% (n = 33) believed that vitamin D supplementation alone is sufficient. According to the participants, the factors that can prevent osteoporosis are as follows: calcium and vitamin D supplementation (n = 43), regular sunlight exposure (n = 34) and physical activity (n = 27).

Conclusion: Our study revealed that while most Tunisian women reported having some awareness of OP, their level of knowledge was average, especially regarding treatment options. Hence, OP education programs are highly recommended among Tunisian women.

Reference: (1) Vaishya R, et al. Indian J Orthop 2023;57(Suppl1):94

P546
EVALUATION OF THE KNOWLEDGE OF TUNISIAN ORTHOPEDIC SURGEONS IN PERIOPERATIVE METHOTREXATE MANAGEMENT

H. Bettaieb[1], H. Ben Ayed[1], M. Ben Romdhane[2], M. Boudokhane[1], W. Helali[1], R. Bourguiba[3], M. H. Dougui[3], S. Belakhal[3]

[1]Dept. of Internal Medicine, Internal Security Forces Hospital, [2]Dept. of Orthopaedic Surgery, Internal Security Forces Hospital, [3]Dept. of Internal Medicine, Internal Security Forces Hospital, La Marsa, Tunisia

Objective: To assess the knowledge and attitudes of Tunisian orthopedic surgeons regarding the perioperative Methotrexate (MTX) management in patients with chronic inflammatory rheumatism (CIR).

Methods: A cross-sectional descriptive study, an anonymous questionnaire composed of 16 questions, designed with the Google-Forms software, was sent to Tunisian orthopedic surgeons. The data were analyzed with descriptive statistics using the SPSS statistical package.

Results: A total of 50 surgeons responded to the questionnaire (46 men and 4 women). The mean age was 38.1 ± 10.7 [26-66] y. Participants were as follows: 40% residents (n = 20), 31% orthopedic surgeons in the public sector and 29% orthopedic surgeons in the private sector. Forty-two percent (n = 21) of them have been practicing for more than 10 years. About 70% (n = 35) of them think that arthroplasty in patients taking MTX is a surgery with septic risk. Forty-four surgeons (88%) agreed that MTX should be discontinued temporarily prior to surgery. During the pre-operative preparation, 82% (n = 41) of orthopedics seek the advice of rheumatologist (82%), 10% of them (n = 5) ask for the anesthetists' opinion and 8% of them (n = 4) rely on the High Authority of Health (HAS) recommendations. According to them, the continuation of MTX could be the cause of an increased perioperative infection risk (57.1% of responses) or a delayed wound healing (22.4% of responses). After orthopedic surgery, only 11 (22%) of participants believed that MTX can be resumed once the wound has healed. Thirteen (26.5%) of them were uncertain about the timing for restarting. Overall, 92% (n = 46) of orthopedic surgeons considered their academic training about the perioperative management of MTX inadequate and poor.

Conclusion: We identified a low to average level of knowledge among orthopedic surgeons regarding the perioperative use of MTX in patients with CIR. Training courses for these physicians on this frequent clinic situation is needed.

P547
JOURNEY OF POLYMYALGIA RHEUMATICA PATIENTS IN TUNISIA: FROM SYMPTOMS TO TREATMENT

H. Ben Ayed[1], H. Bettaieb[1], Y. Makhlouf[2], S. Miladi[2], A. Fazaa[2], H. Boussaa[2], M. Boudokhane[1], L. Souabni[2], K. Ouenniche[2], S. Kassab[2], S. Chekili[2], K. Ben Abdelghani[2], A. Laatar[2]

[1]Dept. of Internal Medicine, Internal Security Forces Hospital, [2]Dept. of Rheumatology, Mongi Slim Hospital, La Marsa, Tunisia

Objective: Polymyalgia rheumatica (PR) is a chronic inflammatory disease characterized by arthralgia and myalgia of the shoulder and hip girdles that occurs in individuals over the age of 50 y (1). This condition is always long under-recognized and therefore underdiagnosed. We aimed to assess the different delays of PR patients' journey from disease onset to treatment initiation and to identify possible influencing factors.

Methods: We conducted a retrospective study including patients with PR (ACR/EULAR 2012 criteria). Demographic and disease characteristics were collected from medical files. Different intervals were

defined from symptom onset until the initiation of treatment. The significance threshold (p-value) was set at 0.05.
Results: 25 patients were enrolled with a mean age of 75.8 ± 12.4 years old. The male-to-female ratio was 0.16. Mean age at PR onset was 68.6 ± 10.5 y. The onset of symptoms was progressive in 68% of cases. Median delays from onset of symptoms until the first consultation and PR diagnosis were 5 ± 10 [0–48] and 33.4 ± 19.6 [0–75] months, respectively. Median delay from PR diagnosis until treatment initiation was 1 ± 1.4 [0-6] months. A significant association was found between the diagnosis delay and the following parameters: progressive symptoms onset ($p = 0.04$), absence of fatigue ($p = 0.035$) and absence of fever ($p = 0.018$). Diagnosis delay was negatively correlated with C-reactive protein level ($r = -0.55$, $p = 0.01$) and anemia ($r = -0.46$, $p = 0.016$) respectively. However, no correlation was noted between diagnosis delay and the following parameters: age ($p = 0.4$), presence of morning stiffness ($p = 0.1$) and shoulder/ pelvic girdle stiffness ($p = 0.5$).
Conclusion: Our study findings indicate that patients with PR encounter a considerable delay in both diagnosis and treatment initiation. These delays primarily stem from the absence of alarming clinical or biological indicators at the onset of the disease.
Reference: (1) Kermani TA, Warrington KJ. Lancet 2013;381:63

P548
CLINICAL AND THERAPEUTIC FEATURES OF POLYMYALGIA RHEUMATICA IN TUNISIA

H. Bettaieb[1], H. Ben Ayed[1], Y. Makhlouf[2], S. Miladi[2], A. Fazaa[2], H. Boussaa[2], M. Boudokhane[1], L. Souabni[2], K. Ouenniche[2], S. Kassab[2], S. Chekili[2], K. Ben Abdelghani[2], A. Laatar[2]

[1]Dept. of Internal Medicine, Internal Security Forces Hospital, [2]Dept. of Rheumatology, Mongi Slim Hospital, La Marsa, Tunisia

Objective: To describe the clinical and therapeutic features of polymyalgia rheumatica (PR) in Tunisia.
Methods: We conducted a retrospective study including patients with PR (ACR/EULAR 2012 criteria). Demographic and disease characteristics were collected from medical files. The significance threshold (p-value) was set at 0.05.
Results: Overall, 25 patients (21 women and 4 men) were enrolled with a mean age of 75.8 ± 12.4 years old. Mean age at PR onset was 68.6 ± 10.5 y. The onset of symptoms was progressive in 68% of cases. Shoulder and pelvic girdle stiffness were reported by 100% and 36% (n = 9) of patients respectively. Morning stiffness was found in 68% (n = 17) of cases. Giant cell arteritis symptoms were reported by 48% of patients: headache (n = 16), jaw claudication (n = 3), scalp hyperesthesia (n = 3), and B symptoms signs (n = 3). At physical examination, shoulder girdle limitation was found in 84% (n = 21) of cases with bilateral involvement in 20 patients. Pelvic girdle limitation and peripheral arthritis were noted in 12% (n = 3) and 16% (n = 4) cases respectively. Blood inflammatory markers were raised in 96% of cases. Mean erythrocyte sedimentation rate and C-reactive protein were 74.8 ± 30.5 [30–125] mm and 34 ± 43.1 [5–136] mg/l respectively. Shoulder ultrasound was necessary to confirm the diagnosis in four patients and revealed subacromial-subdeltoid bursitis (n = 3) and tenosynovitis of the long head of the biceps (n = 2). Median diagnosis and therapeutic delays were 33.4 ± 19.6 months and 34.5 ± 21.4 months. All patients underwent corticosteroid therapy at an initial mean dose of 23.5 ± 9.1 [10–40] mg/d. Treatment with methotrexate was necessary in 4% of cases. The evolution was as follows: healing (64%), relapse (16%), Giant cell arteritis (12%) and corticosteroid dependence (8%). A significant association was found between diagnosis delay (> 3 months) and unfavourable outcomes ($p = 0.04$).
Conclusion: Our study emphasises the heterogeneous presentations of PR in Tunisia. Early diagnosis and treatment are paramount for a better prognosis.

P549
EVALUATION OF HEALTHCARE PROFESSIONALS' KNOWLEDGE ON OSTEOPOROSIS

H. Ben Ayed[1], H. Bettaieb[1], M. Titey[2], M. Boudokhane[1], W. Helali[1], R. Bourguiba[3], M. H. Dougui[3], S. Belakhal[3]

[1]Dept. of Internal Medicine, Internal Security Forces Hospital, [2]Dept. of Occupational Medicine, Internal Security Forces Hospital, [3]Dept. of Internal Medicine, Internal Security Forces Hospital, La Marsa, Tunisia

Objective: Osteoporosis (OP) is a significant health concern globally, characterized by low bone mass and deterioration of bone tissue (1). The role of healthcare professionals in lowering the burden of osteoporosis via patients and public education is critical. We aimed to assess the level of knowledge of healthcare professionals on OP.
Methods: We conducted a cross-sectional descriptive study among Tunisian healthcare workers (doctors excluded). Participants were invited to answer an anonymous web-based questionnaire composed of 20 questions. The data were analyzed with descriptive statistics using the SPSS statistical package.
Results: A total of 37 healthcare workers (29 women and 8 men), with a mean age of 35.3 ± 16.1 y, responded to the questionnaire. 26 participants (70.3%) were nurses and 70% of them have been practicing for > 5 y. Among the participants, 35% (n = 13) worked in a rheumatology department. Overall, 46% of them (n = 17) regarded their knowledge level of osteoporosis as good. However, only 29.7% (n = 11) of them had participated in OP training courses after their graduation. Regarding the definition of OP, 32.4% (n = 12) of participants wrongly identified this disease as a lack of calcium in bone and as bone inflammation disease. 29 participants (78.4%) knew that OP can occur in both genders. Most of the healthcare professionals (79.5%) recognized that the diagnosis is based on the DXA scan test. Only 48.6% of responders understood the difference between osteopenia and OP. Participants correctly identified these risk factors of OP: positive family history of OP (n = 27), early menopause (n = 24) and long-term corticosteroids therapy (n = 22). Overall, 62% (n = 23) of women were aware that OP leads to an increased risk of bone fracture. Only 37.8% (n = 14) of healthcare workers acknowledged bisphosphonates as effective treatments, while 65% (n = 25) believed that vitamin D supplementation alone is sufficient.
Conclusion: Healthcare workers have a moderate level of knowledge and attitude towards OP. Thus, implementing practical and motivational training methods seems essential to improve the understanding and engagement of healthcare professionals.

P550
ARE BLOOD CELLS-DERIVED INDEXES INDICATORS OF LOW BONE MINERAL DENSITY IN RHEUMATOID ARTHRITIS?

H. Ben Ayed[1], Y. Makhlouf[1], H. Boussaa[1], A. Fazaa[1], S. Miladi[1], L. Souabni[1], K. Ouenniche[1], S. Kassab[1], S. Chekili[1], K. Ben Abdelghani[1], A. Laatar[1]

[1]Dept. of Rheumatology, Mongi Slim Hospital, La Marsa, Tunisia

Objective: To investigate the association between different blood-cell-based indexes (BCI) and BMD in rheumatoid arthritis (RA) patients.

Methods: We conducted a retrospective study including patients with RA (ACR/EULAR 2010 criteria). BMD testing was performed using DXA. The following indexes were derived from the absolute neutrophil (N), lymphocyte (L), and platelet (P) counts: the neutrophil to lymphocyte ratio (NLR) = N/L; the platelet to lymphocyte ratio (PLR) = P/L; the product of platelet count and neutrophil count (PPN) and the systemic immune-inflammation index (SII) = P × (N/L).The significance threshold was set at a p value < 0.05.
Results: 48 patients with a male-to-female ratio of 0.17 were included. The mean age was 59.5 (11) [31–83] y. The mean 28 disease-activity-score (DAS28) ESR was 4.07 (1.4) [1.6–6.9]. The mean BMD at the lumbar spine (LS) and femoral neck (FN) sites were 0.916 (0.196) [0.531–1.48] and 0.784 (0.2) [0.263–1.434]. A BMD decrease was noted in 79% of the patients: osteopenia (21%) and osteoporosis (58%). The mean NLR, PLR, PPN and SII were 2.3 ± 1.2, 1.41 ± .55, 151 ± 82.8 and 703.3 ± 474.8, respectively. A positive significant correlation was noted between the DAS28ESR and the PLR (r = 0.3, p = 0.02) and the SII (r = 0.28, p = 0.047). The FN BMD was negatively associated with the PLR (r = − 0.432, p = 0.017) and the SII (r = − 0.288, p = 0.038). No significant correlation was noted between LS BMD and the different BCI ($p > 0.05$). Multiple linear regression analysis showed that NLR (β = − 0.25, p = 0.7), PLR (β = − 0.24, p = 0.07), PPN (β = − 0.82, p = 0.3), and SII (β = − 0.9, p = 0.3) were not independent predictors for BMD decrease.
Conclusion: PLR and SII are significantly associated with a lower FN BMD in RA patients, as they are strongly correlated to disease activity, which suggest that osteoporosis in RA patients results from the systemic immune and inflammatory status of the human body rather than from the direct effect of immune cells on bone cells.

P551
EPIGENETIC REGULATION OF IL-4 PROMOTER TARGETING P300 ATTENUATING INTERVERTEBRAL DISC DEGENERATION AND PAIN BY INHIBITING IL-1B

H. Cui[1], Z. Zheng[2]

[1]Sichuan Academy of Medical Sciences·Sichuan Provincial People's Hospital, Chengdu, [2]The First Affiliated Hospital of Sun Yat-sen Univ., Guangzhou, China

Objective: To investigate the role of p300/IL-4 in intervertebral disc degeneration (IVDD) and pain and elucidate the underlying molecular mechanism.
Methods: Human intervertebral disc samples were collected and graded based on the Pfirrmann grading scheme. A rat model of IVDD was established through posterior disc puncture, and various treatments were administered. The mechanical and thermal hyperalgesia were assessed using von Frey hair tests and the plantar test, respectively. Chromatin immunoprecipitation (ChIP) and ChIP-qPCR were performed, and lentivirus transduction was used for p300 knockdown.
Results: We investigated the role of CBP/p300 in IVDD. Degenerated nucleus pulposus (NP) tissues from IVDD patients exhibited a significant downregulation of p300 at both nucleic acid and protein levels, while CBP levels remained unchanged. Manipulating p300 expression in NPCs regulated matrix production, with p300 overexpression enhancing aggrecan and collagen II expression and knockdown leading to increased matrix-degrading proteins. In a rat IVDD model, activating p300 function with CTPB alleviated IVDD and pain, while inhibiting p300 with C646 exacerbated IVDD and pain. Transcriptome analysis implicated IL-4 as a downstream effector of p300, and IL-4 demonstrated protective effects against IVDD and pain. Mechanistically, p300 was found to acetylate H3K27 at the IL-4 promoter, promoting its expression.

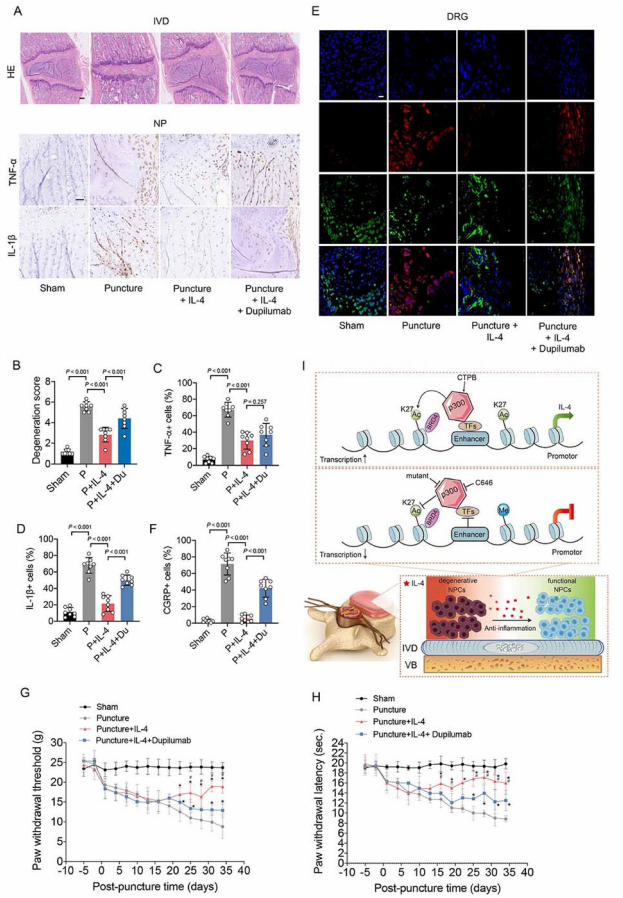


Figure. IL-4 has a therapeutic effect on IVDD and pain behavior. (A-B) Morphological staining and quantitative analysis of the effect of IL-4 and dupilumab on disc degeneration in vivo. IHC staining of TNF-α and IL-1β positive cells in sham, puncture, puncture + IL-4 and puncture + IL-4 + dupilumab group. Scale bar: 100 μm. n=8 per group. (C-D) Quantitative analysis of TNF-α and IL-1β positive cells in (A). (E-F) IHC staining and quantitative analysis of CGRP in DRGs. Scale bar: 100 μm. n=8 per group. (G-H) The 50% withdrawal threshold and thermal withdrawal threshold in puncture model of sham, puncture, puncture + IL-4 and puncture + IL-4 + dupilumab group. (I) Schematic diagram illustrating p300/IL-4 alleviate IVDD and pain by inhibiting the inflammatory microenvironment.

Conclusion: The novel findings of this study suggest that the p300/IL-4/IL-1β axis may represent a promising therapeutic target for IVDD and LBP. These results propose a hypothesis that early in the inflammatory phase, NPCs may initiate a self-protective mechanism through p300, aiding itself in preserving a favorable metabolic microenvironment. This mechanism is primarily mediated by the expression of IL-4, which has the capacity to counteract IL-1β, rather than TNFα.

P552
A SURROGATE FRAX MODEL FOR MONGOLIA

H. Johansson[1], M. Jaalkhorol[2], A. Dashtseren[3], S. Avirmed[4], O. Bruyere[5], M. Schini[6], E. Liu[1], M. Lorentzon[7], L. Vandenput[1], N. Harvey[8], E. McCloskey[9], J. Kanis[10]

[1]Mary McKillop Institute for Health Research, Australian Catholic Univ., Melbourne, Australia, [2]Dept. for Student Development and Management, Mongolian National Univ. of Medical Sciences, Ulaanbaatar, Mongolia, [3]Dept. of Preventive Medicine, School of Public Health, Mongolian National Univ. of Medical Sciences, Ulaanbaatar, Mongolia, [4]Graduate School, Mongolian National Univ. of Medical Sciences, Ulaanbaatar, Mongolia, [5]Division of Public

Health, Epidemiology and Health Economics, Univ. of Liege, Liege, Belgium, [6]Dept. of Oncology and Metabolism, Univ. of Sheffield, Sheffield, UK, [7]Sahlgrenska Osteoporosis Centre, Institute of Medicine, Univ. of Gothenburg, Gothenburg, Sweden, [8]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK, [9]Centre for Metabolic Bone Diseases, Univ. of Sheffield, Sheffield, UK, [10]Mary McKillop Institute for Health Research, Australian Catholic Univ., Melbourne, Australia

Objective: FRAX models are frequently requested for countries with little or no data on the incidence of hip fracture. In such circumstances, the International Society for Clinical Densitometry and International Osteoporosis Foundation have recommended the development of a surrogate FRAX model, based on country-specific mortality data but using fracture data from another country, usually within the region, where fracture rates are considered to be representative of the index country. This abstract describes the development and characteristics of a surrogate FRAX model for Mongolia.

Methods: The FRAX model used the ethnic-specific incidence of hip fracture in men and women living in China, combined with the death risk for Mongolia (United Nations (UN), 2015–2019). The 10-y probability of a major osteoporotic fracture (MOF) was used when comparing the surrogate model and the FRAX model for China. Examples are given for a woman with no clinical risk factors and BMI 25 kg/m^2, where the BMD was not known. The hip fracture incidence and UN population data were used to calculate estimated number of fractures 2020 and 2050.

Results: The surrogate model gave similar 10-y fracture probabilities for men and women compared to the model for China. There were very close correlations (r = 0.99) in fracture probabilities between the surrogate and authentic models, so that the use of the Mongolia model had little impact on the rank order of risk. When the fracture incidence from Chinas was used to the population of Mongolia, it was estimated that 530 hip fractures arose in 2020 in individuals over the age of 50 y, with a predicted increase by approximately 3.6 times to 1896 in 2050.

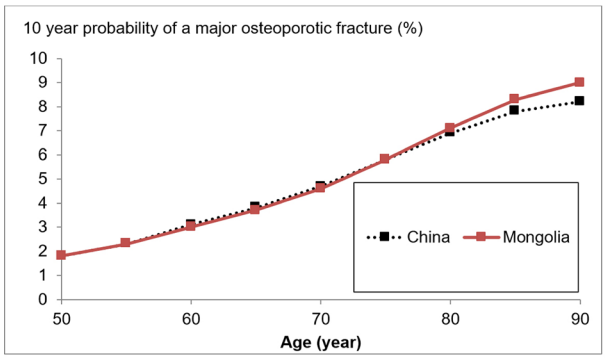


Figure The 10-year probability of a major osteoporotic fracture (%) for a woman with no clinical risk factors, BMI 25 kg/m^2 where the BMD was not known.

Conclusion: The surrogate FRAX model for Mongolia provides an opportunity to determine fracture probability within the Mongolia population and help guide decisions about treatment.

P553
EPIDEMIOLOGY OF HIP FRACTURE IN EGYPT AND DEVELOPMENT OF A COUNTRY-SPECIFIC FRAX MODEL

H. Johansson[1], Y. El Miedany[2], M. El Gaafary[3], N. Gadallah[4], S. Mahran[5], M. Abu-Zaid[6], W. Hassan[7], W. Elwakil[8], N. Harvey[9], M. Schini[10], E. Liu[1], L. Vandenput[1], M. Lorentzon[11], E. McCloskey[12], J. Kanis[13]

[1]Mary McKillop Institute for Health Research, Australian Catholic Univ., Melbourne, Australia, [2]Canterbury Christ Church Univ., England, UK, [3]Community and Public Health, Ain Shams Univ., Cairo, Egypt, [4]Rheumatology and Rehabilitation, Ain Shams Univ., Cairo, Egypt, [5]Physical Medicine, Rheumatology and Rehabilitation, Assiut Univ., Assiut, Egypt, [6]Rheumatology and Rehabilitation, Tanta Univ., Tanta, Egypt, [7]Rheumatology and Rehabilitation, Benha Univ., Benha, Egypt, [8]Physical Medicine, Rheumatology and Rehabilitation, Alexandria Univ., Alexandria, Egypt, [9]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK, [10]Dept. of Oncology and Metabolism, Univ. of Sheffield, Sheffield, UK, [11]Sahlgrenska Osteoporosis Centre, Institute of Medicine, Univ. of Gothenburg, Gothenburg, Sweden, [12]Centre for Metabolic Bone Diseases, Univ. of Sheffield, Sheffield, UK, [13]Mary McKillop Institute for Health Research, Australian Catholic Univ., Melbourne, Australia

Objective: To develop a country-specific fracture prediction FRAX® tool for Egypt based on the epidemiology of osteoporotic fractures in the State of Egypt.

Methods: Hip fracture data (ICD 10: S72.0, S72.1, S72.2) were sourced from Fracture Liaison Service centres in Alexandria and Assiut University Hospitals covering the northern and southern parts of Egypt during the period from February 2022 to February 2023 [El Miedany et al., Arch Osteoporos 2023;18:115]. The derived age- and sex-specific incidence of hip fracture were combined with national mortality rates (United Nations (UN), 2015–2019) to create a FRAX model for Egypt. Fracture probabilities were compared with those from neighboring countries having FRAX models. The hip fracture incidence and UN population data were used to calculate the estimated number of fractures in 2020 and 2050.

Results: Age-specific fracture rates were higher in women than in men except for the age intervals 45–49 y. Hip fracture rates were lower than estimates from Israel, Malta, and Greece, particularly at older ages. Therefore, probabilities of a major osteoporotic fracture or hip fracture were also lower in Egypt than in the comparison countries. When the fracture incidence from Egypt was applied to the population of Egypt, it was estimated that 27,016 hip fractures arose in 2020 in individuals over the age of 50 y, with a predicted increase of approximately 2.8 times to 77,345 in 2050.

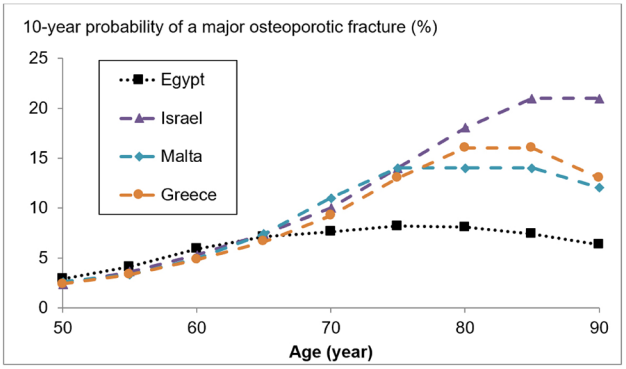


Figure The 10-year probability of a major osteoporotic fracture (%) for a woman with no clinical risk factors, BMI 25 kg/m^2, and BMD not included.

Conclusion: The FRAX model should enhance the accuracy of determining fracture probability among the Egypt population and help guide treatment decisions.

P554
EPIDEMIOLOGY OF HIP FRACTURE IN COSTA RICA AND DEVELOPMENT OF A COUNTRY-SPECIFIC FRAX MODEL

P. Clark[1], H. Johansson[2], S. Cerdas Perez[3], A. Ortiz[4], G. Cruz Pliego[1], N. Harvey[5], M. Schini[6], E. Liu[2], L. Vandenput[2], M. Lorentzon[7], E. McCloskey[8], J. Kanis[9]

[1]Clinical Epidemiology Unit, Children's Hospital of Mexico, Federico Gomez-Faculty of Medicine, National Autonomous Univ. of Mexico (UNAM), Mexico City, Mexico, [2]Mary McKillop Institute for Health Research, Australian Catholic Univ., Melbourne, Australia, [3]Dept. of Endocrinology, Hospital Cima San José, Universidad de Costa Rica, San José, Costa Rica, [4]School of Public Health, Faculty of Medicine, Univ. of Costa Rica, San José, Costa Rica, [5]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK, [6]Dept. of Oncology and Metabolism, Univ. of Sheffield, Sheffield, UK, [7]Sahlgrenska Osteoporosis Centre, Institute of Medicine, Univ. of Gothenburg, Gothenburg, Sweden, [8]Centre for Metabolic Bone Diseases, Univ. of Sheffield, Sheffield, UK, [9]Mary McKillop Institute for Health Research, Australian Catholic Univ., Melbourne, Australia

Objective: To describe the epidemiology of osteoporotic fractures in the State of Costa Rica and develop a corresponding country-specific FRAX® tool.

Methods: Hip fracture data (ICD 10: S72.0, S72.1, S72.2) were retrieved from the discharge database for the years 2015–2019 from Caja Costaricense de Seguro Social (CCSS), the principal public health care provider in the state of Costa Rica. The CCSS covers almost 91%, and is representative, of the country's population. These data were used to derive age- and sex-specific incidence of hip fracture in Costa Rica residents and, combined with national mortality rates (United Nations (UN), 2015–2019), were used to create a FRAX model for Costa Rica. Fracture probabilities were compared with those from neighboring countries having FRAX models. The hip fracture incidence and UN population data were used to calculate the estimated number of fractures nationally in 2020 and 2050.

Results: Age-specific fracture rates were higher in women than in men except for ages 50-59 y. Hip fracture rates were somewhat higher than estimates from Ecuador, Venezuela, Colombia, and Mexico. Therefore, probabilities of a major osteoporotic fracture or hip fracture were also higher in Costa Rica than in the neighboring countries (Figure). Using these incidence rates, it was estimated that 3176 hip fractures occurred in 2020 amongst individuals over the age of 50 years, with a predicted increase by approximately 3.1 times to 9946 in 2050.

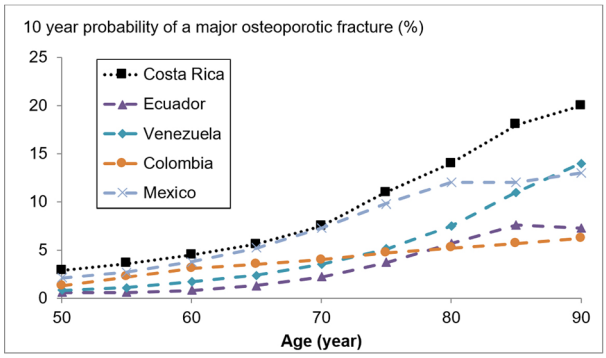


Figure The 10-year probability of a major osteoporotic fracture (%) for a woman with no clinical risk factors, BMI 25 kg/m^2, and where BMD was not known.

Conclusion: The FRAX model should enhance the accuracy of determining fracture probability among the Costa Rica population and help guide treatment decisions.

P555
A SURROGATE FRAX MODEL FOR BRUNEI

H. Johansson[1], Y. Kwang[2], M. Chandran[3], M. Schini[4], M. Lorentzon[5], L. Vandenput[1], N. Harvey[6], E. McCloskey[7], J. Kanis[8], E. Liu[1]

[1]Mary McKillop Institute for Health Research, Australian Catholic Univ., Melbourne, Australia, [2]Endocrine Centre, Raja Isteri Pengiran Anak Saleha Hospital, Brunei Darussalam, Darussalam, Brunei, [3]Osteoporosis and Bone Metabolism Unit, Dept. of Endocrinology, Singapore General Hospital, Singapore, Singapore, [4]Dept. of Oncology and Metabolism, Univ. of Sheffield, Sheffield, UK, [5]Sahlgrenska Osteoporosis Centre, Institute of Medicine, Univ. of Gothenburg, Gothenburg, Sweden, [6]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK, [7]Centre for Metabolic Bone Diseases, Univ. of Sheffield, Sheffield, UK, [8]Mary McKillop Institute for Health Research, Australian Catholic Univ., Melbourne, Australia

Objective: FRAX® models are frequently requested for countries with little or no data on the incidence of hip fracture. In such circumstances, the International Society for Clinical Densitometry and International Osteoporosis Foundation have recommended the development of a surrogate FRAX model, based on country-specific mortality data but using fracture data from another country, usually within the region, where fracture rates are considered to be representative of the index country. This abstract describes the development and characteristics of a surrogate FRAX model for Brunei.

Methods: The FRAX model used the ethnic-specific incidence of hip fracture in men and women living in Singapore with Malay ethnicity (Source: Singapore Ministry of Health), combined with the death risk for Brunei (United Nations (UN), 2019). The 10-y probability of a major osteoporotic fracture (MOF) was used when comparing the surrogate model and the FRAX model for Singapore Malays. Examples are given for a woman with no clinical risk factors, BMI 25 kg/m^2, and BMD unknown. The hip fracture incidence and UN population data were used to calculate estimated number of fractures in 2020 and 2050.

Results: The surrogate model gave similar 10-y fracture probabilities for men and women up to the age of 75 y compared to the model for Singapore Malays. For older ages the probabilities were lower for the surrogate model due to higher death risk in Brunei. There were very close correlations (r = 0.99) in fracture probabilities between the surrogate and authentic models, so that the use of the Brunei model had little impact on the rank order of risk. When the fracture incidence from Singapore Malays was used to the population of Brunei, it was estimated that 117.7 hip fractures arose in 2020 in individuals over the age of 50 years, with a predicted increase by approximately 5.6 times to 663.9 in 2050.

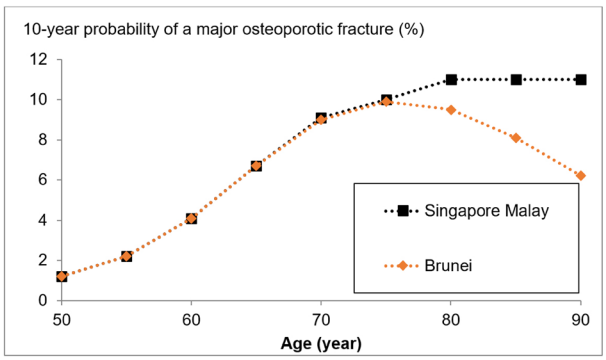


Figure The 10-year probability of a major osteoporotic fracture (%) for a woman with no clinical risk factors, BMI 25 kg/m^2, and BMD unknown.

Conclusion: The surrogate FRAX model for Brunei provides an opportunity to determine fracture probability within the Brunei population and help guide decisions about treatment.

Acknowledgement: Asia Pacific Consortium on Osteoporosis (APCO) for assistance and collaboration

P556
A SURROGATE FRAX MODEL FOR BANGLADESH

H. Johansson[1], A. Shahin[2], M. Choudhury[2], M. Chandran[3], M. Schini[4], E. Liu[1], M. Lorentzon[5], L. Vandenput[1], N. Harvey[6], E. McCloskey[7], J. Kanis.[8]

[1]Mary McKillop Institute for Health Research, Australian Catholic Univ., Melbourne, Australia, [2]Dept. of Rheumatology, Bangabandhu Sheikh Mujib Medical Univ., Dhaka, Bangladesh, [3]Osteoporosis and Bone Metabolism Unit, Dept. of Endocrinology, Singapore General Hospital, Singapore, Singapore, [4]Dept. of Oncology and Metabolism, Univ. of Sheffield, Sheffield, UK, [5]Sahlgrenska Osteoporosis Centre, Institute of Medicine, Univ. of Gothenburg, Gothenburg, Sweden, [6]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK, [7]Centre for Metabolic Bone Diseases, Univ. of Sheffield, Sheffield, UK, [8]Mary McKillop Institute for Health Research, Australian Catholic Univ., Melbourne, Australia

Objective: FRAX® models are frequently requested for countries with little or no data on the incidence of hip fracture. In such circumstances, the International Society for Clinical Densitometry and International Osteoporosis Foundation have recommended the development of a surrogate FRAX model, based on country-specific mortality data but using fracture data from another country, usually within the region, where fracture rates are considered to be representative of the index country. This abstract describes the development and characteristics of a surrogate FRAX model for Bangladesh.

Methods: The FRAX model used the ethnic-specific incidence of hip fracture in men and women living in Singapore with Indian ethnicity (Source: Singapore Ministry of Health), combined with the death risk for Bangladesh (United Nations (UN), 2015–2019). The 10-year probability of a major osteoporotic fracture (MOF) was used when comparing the surrogate model and the FRAX model for Singapore Indians. Examples are given for a woman with no clinical risk factors, BMI 25 kg/m^2, and BMD unknown. The hip fracture incidence and UN population data were used to calculate estimated number of fractures in 2020 and 2050.

Results: The surrogate model gave similar 10- fracture probabilities for men and women compared to the model for Singapore Indians. There were very close correlations (r = 0.99) in fracture probabilities between the surrogate and authentic models, so that the use of the Bangladesh model had little impact on the rank order of risk. When the fracture incidence from Singapore Indians was applied to the population of Bangladesh, it was estimated that 48,185 hip fractures arose in 2020 in individuals over the age of 50 years, with a predicted increase by approximately 3.6 times to 171,858 in 2050.

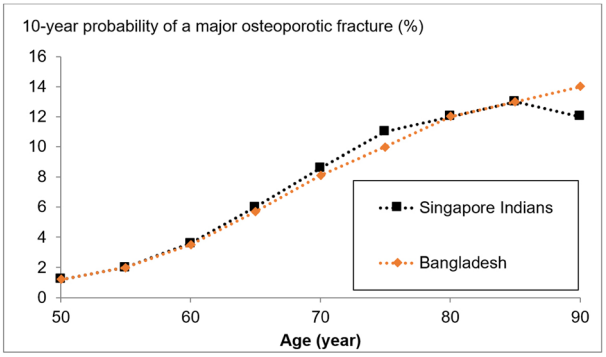


Figure The 10-year probability of a major osteoporotic fracture (%) for a woman with no clinical risk factors, BMI 25 kg/m^2, and BMD unknown.

Conclusion: The surrogate FRAX model for Bangladesh provides an opportunity to determine fracture probability within the Bangladesh population and help guide decisions about treatment.

Acknowledgement: Asia Pacific Consortium on Osteoporosis (APCO) for assistance and collaboration

P557
EFFECTS OF TST002 (BLOSOZUMAB) IN CHINESE SUBJECTS WITH REDUCED BONE MINERAL DENSITY: A SINGLE ASCENDING DOSE TRIAL

J. Li[1], D. Chen[2], P. Feng[2], L. Li[3], X. Zhu[1], B. Cao[1], Q. Wang[2], C. Li[3], X. Qian[4], C. Germa[4], C. Qi[4], J. Wang[4], Z. Yao[4], X. Lin[4], Y. Liu[4], X. Zhu[4], H. Lin[1]

[1]Metabolic Bone Disease Prevention and Treatment Research Center, Nanjing Drum Tower Hospital, Nanjing, [2]Dept. of Endocrinology and Metabolism, West China Hospital, Chendu, [3]Endocrine Dept., The First Affiliated Hospital of Henan Univ. of Science and Technology, Luoyang, [4]Clinical Research & Development, Suzhou Transcenta Therapeutics Co., Ltd, Suzhou, China

Objective: TST002 (blosozumab) is a humanized monoclonal antibody targeting sclerostin. The study was aimed to evaluate the safety, tolerability, pharmacokinetics, pharmacodynamics of TST002 in Chinese population.

Methods: In the randomized, double-blind, placebo-controlled, ascending, single-dose study, eligible subjects received TST002 (200, 400, 800 or 1200 mg) or placebo intravenously in a ratio of 3:1 and were monitored for 85 d after dosing.

Results: 30 postmenopausal women and 2 elder men with reduced BMD were enrolled. The mean lumbar spine, total hip and femoral neck BMD T value at baseline were − 1.50, − 1.42, − 1.70. The single dose administration of TST002 200–1200 mg demonstrated a generally good tolerability and safe profile. Most TEAEs were of grade 1 or 2 (CTCAE v5.0). The TEAEs reported by ≥ 3 subjects included hypocalcemia, fecal occult blood positive, blood triglyceride increased, upper respiratory tract infection, COVID-19, blood low density lipoprotein increased, and blood alkaline phosphatase increased. The incidence was almost balanced between TST002 and placebo cohort and without dose correlation. No DLT, SAE, or death event was reported. The exposure (C_{max}, AUC) showed a positive correlation with TST002 dosage. The half-life ranged from 4.38–8.06 d. Furthermore, a dose dependent increase in lumbar spine bone BMD was observed at D85, ranging from 3.52–6.20%, which was higher than 0.30% in placebo cohort. The percentage change at D85 from baseline in total hip and femoral neck BMD also exhibited a positive correlation with the dosage, ranging from 1.30–1.74% and − 0.01% to 1.85% respectively, which were higher than 0.51% and -0.73% in placebo cohort. The P1NP level experienced a rapid increase with dose correlation while the β-CTX displayed a quick decrease without dose correlation after TST002 administration.
Conclusion: The single dose administration of TST002 up to 1200 mg was found to be well tolerated without cardiac signal. Encouraging increase in BMD was observed, consistent with that in pervious blosozumab SAD studies in Caucasian and Japanese population. These findings suggest the potential efficacy of TST002 as a therapeutic option for the patients with osteoporosis and other bone diseases. Multiple dose studies with less frequent dosing intervals are warranted.

P558
BASELINE BONE HEALTH ASSESSMENTS IN PATIENTS WITH ADVANCED MELANOMA RECEIVING HIGH-DOSE SYSTEMIC GLUCOCORTICOIDS FOR IMMUNE CHECKPOINT INHIBITOR INDUCED TOXICITY

H. N. Katifi[1], N. Coupe[1], H. E. Turner[2], M. Bhattacharyya[3], M. K. Javaid[4]

[1]Dept. of Oncology, Oxford Univ. Hospitals NHS Foundation Trust, Oxford, [2]Dept. of Endocrinology, Oxford Centre for Diabetes, Endocrinology and Metabolism, Univ. of Oxford, Oxford, [3]Berkshire Cancer Centre, Royal Berkshire Hospital, Reading, [4]Nuffield Dept. of Orthopaedics, Rheumatology and Musculoskeletal Sciences, Univ. of Oxford, Oxford, UK

Objective: Immune checkpoint inhibitors (ICIs) have transformed oncology therapeutics yet can cause severe immune-related adverse events (irAEs) that require high-dose systemic glucocorticoids. We evaluate whether bone health assessments and anti-osteoporotic interventions are implemented by oncologists at glucocorticoid initiation for ICI-induced irAEs.
Methods: Between December 2016 and April 2023, 233 adults with advanced melanoma received combination ipilimumab and nivolumab at a UK tertiary cancer centre. 141 (60.5%) were exposed to high-dose glucocorticoids, equivalent to ≥ 5 mg/d prednisolone over 3 months. A consecutive series by NHS number were audited to collect: (i) FRAX® clinical risk factors; (ii) features of vertebral compression fractures (VCFs) including ≥ 4 cm height loss, kyphosis, and back pain; (iii) calcium intake; (iv) 25-hydroxyvitamin D (25-OHD) level; (v) DXA; and (vi) pharmacologic measures to prevent glucocorticoid-induced osteoporosis.
Results: 20 patients were sampled with a median age of 63.5 y. 8/20 patients were female and 75% postmenopausal. 65% received ≥ 2 glucocorticoid courses for irAEs. No patients were considered for anti-osteoporosis medication at baseline glucocorticoid exposure. 4 patients underwent DXA scans, and 2 were subsequently commenced on bisphosphates, both following an osteopenia diagnosis. 6/9 tested for 25-OHD were deficient (< 50 nmol/L). 3/9 patients with back pain had radiographic evidence of VCFs. Smoking and alcohol history were determined in 75% of patients. No patients were evaluated for: calcium intake, ≥ 4 cm height loss, thoracic kyphosis, nor parental history of hip fracture.
Conclusion: Baseline bone health assessments are sub-optimally performed by oncologists for patients with advanced melanoma receiving high-dose systemic glucocorticoids for ICI-induced irAEs. Vitamin D deficiency and VCFs were common, confirming the importance of integrating bone health as part of the management of oncology patients receiving ICIs.
Disclosures: MKJ: Honoraria and consultancy from UCB Ltd and Amgen Ltd, and grant support from UCB Ltd (unrelated to the work presented).

P559
REAL-WORLD DATA OF OSTEOPOROTIC TREATMENT WITH ANABOLIC AGENTS

H. T. Lee[1], Y. L. Teng[2], T. Y. Chen[3]

[1]Lee General Hospital, [2]Osteoporosis Prevention Center, Taichung Veterans General Hospital, [3]Dept. of Neurosurgery, Neurological Institute, Taichung Veterans General Hospital, Taichung, Taiwan

Objective: Osteoporosis is a major health issue in most aging society. As the fourth common health issue in the elderly population in Taiwan, the prevalence of osteoporosis is around 25.9% and 38.3% in man and woman over 50. The condition has brought about substantial morbidity and mortality once left unattended. Teriparatide is an anabolic agent which not only increases BMD, and reduces the risk of vertebral fracture and hip fracture. Romosozumab is another anabolic agent that has been widely used as new tools against osteoporosis with established efficacy, tolerability and preferable treatment interval. The aim of this study is to retrospectively analyze the real-world data of these two agents in terms of improvements in BMD.
Methods: We reviewed the medical records of the patients who received teriparatide or romosozumab in a tertiary medical center in the past 5 y. Those who did not complete the treatment course (12 months of teriparatide or 12 doses of romosozumab) were excluded. The BMD data before and after the treatment was analyzed.
Results: A total of 195 patients were enrolled for analysis; 152 patients received teriparatide and 43 receive romosozumab. The median BMD of lumbar spine before and after treatment with teriparatide was 0.754 and 0.823. BMD of lumbar spine before and after treatment with romosozumab was 0.780 and 0.892. Both groups have statistically significant increase in the BMD. The mean difference in the teriparatide group is 0.053 and the romosozumab 0.101.
Conclusion: We presented real-world data of patients treated with anabolic agents for osteoporosis. Both agents showed notable increase in the BMD but the difference is more prominent in those who treated with romosozumab. Future studies need to focus on subgroup analysis and try to developed personalized, tailored therapy for osteoporotic patients.

P560
NUTRITIONAL AND METABOLIC STATUS AFFECT MUSCLE AND BONE MASS IN ELDERLY JAPANESE TYPE2 DIABETES PATIENTS

H. Todoroki[1], T. Takayanagi[1], K. Kamimura[2], S. Asai[3], A. Harada[4], A. Ito[4], K. Iwai[1], H. Sumioki[1], M. Hatsuno[1], H. Koide[1], Y. Nakajima-Hasegawa[1], K. Yamaguchi[1], H. Shigeyasu[1], K. Nishida[1], S. Kanie[1], S. Fuse[1], R. Morikawa[1], Y. Asada[1], S. Kumon[1], S. Ueno[1], K. Okamoto[1], Y. Matsuo[1], Y. Yoshino[1], I. Hiratsuka[1], S. Sekiguchi-Ueda[1], A. Kakita[5], M. Shibata[1], Y. Seino[1], N. Hayakawa[6], A. Suzuki[1]

[1]Dept. of Endocrinology, Diabetes and Metabolism, Fujita Health Univ., Toyoake, [2]Nursing Dept., Fujita Health Univ. Hospital, Toyoake, [3]Food and Nutrition Services Dept., Fujita Health Univ. Hospital, Toyoake, [4]Food and Nutrition Services Dept., Fujita Health Univ. Hospital, Toyoake, [5]Dept. of Joint Research Laboratory of Clinical Medicine, Fujita Health Univ., Okazaki Medical Center, Okazaki, [6]Clinical Pharmacotherapeutics I, Faculty of Pharmacy, Meijo Univ., Nagoya, Japan

Objective: To evaluate the relationship between nutritional and metabolic status with muscle and bone mass in elderly patients with type 2 diabetes (T2DM).
Methods: A cross-sectional study was conducted in elderly Japanese T2DM patients equal to or above 75 years old in single diabetes center. Nutrient intake and physical activity were estimated by questionnaires. Fasting blood and serum samples were collected. Skeletal muscle index (SMI) by bioelectrical impedance analysis (BIA), handgrip strength, and gait speed were measured. BMD was measured by DXA, and their image at the hip region were analyzed by using 3D-SHAPER^{TM} software.
Results: A total of 46 independent elderly T2DM patients were enrolled from August 2021 to November 2022, with 19 males (81.1 $\pm$ 3.9 y) and 27 females (79.6 $\pm$ 3.4 y). BMI was 22.8 $\pm$ 4.8 kg/m^2 for male, and 21.8 $\pm$ 2.8 kg/m^2 for female. Mean Barthel ADL index was 94.1 $\pm$ 8.7. HbA1c and FBG levels were 8.0 $\pm$ 1.5% and 141.0 $\pm$ 34.0 mg/dL, respectively. According to AWGS2019, 21 participants were diagnosed as sarcopenia. There were 18 participants with osteoporosis, a half of which had both sarcopenia and osteoporosis. SMI had positive correlation with total amino acids, essential amino acids, branched-chain amino acids and C-peptide. Femoral neck BMD showed positive association with serum C-peptide. Although the correlation between exercise amount and SMI was not statistically significant, a tendency toward a positive correlation was observed.
Conclusion: Branched-chain amino acids, which are components of skeletal muscle proteins and have been shown to promote skeletal muscle synthesis and suppress degradation, act to maintain the formation and maintenance of skeletal muscle also in elderly people with type 2 diabetes and suggests that insulin secretion is involved in maintaining skeletal muscle mass and femoral neck BMD.

P561
AGE- AND SEX-SPECIFIC INCIDENCE RATES AND FUTURE PROJECTIONS FOR HIP FRACTURES IN ZIMBABWE

H. Wilson[1], T. Manyanga[2], A. Burton[1], N. Mafirakureva[1], P. Mushayavanhu[3], M. Ndekwere[3], J. Chipanga[2], S. Graham[4], J. Masters[4], M. Costa[4], R. Ferrand[2], C. Gregson[1]

[1]Musculoskeletal Research Unit, Bristol Medical School, Univ. of Bristol, Bristol, UK, Bristol, UK, [2]The Health Research Unit (THRU) Zimbabwe, Biomedical Research and Training Institute, Harare, Zimbabwe, Harare, Zimbabwe, [3]Dept. of surgery, Sally Mugabe Central Hospital, Zimbabwe, Harare, Zimbabwe, [4]Oxford Trauma and Emergency Care, Nuffield Dept. of Orthopaedics, Rheumatology and Musculoskeletal Science, UK, Oxford, UK

Objective: In southern Africa, rapidly ageing populations are increasing demands on healthcare services, hence we estimated current and future hip fracture incidence in Zimbabwe.
Methods: Cumulative hip fracture incidence was determined over 2 y (Oct 2021–Oct 2023) in all adults aged $\geq$ 40 y, resident in Harare, presenting to any of the 7 hospitals in Harare. Sex-specific incidence hip fracture rates per 100,000 were calculated for 5-y age bands using United Nations (UN) population estimates for the city in 2021. National UN estimates were then used to calculate age-standardised hip fracture incidence rates in adults age $\geq$ 40 y across Zimbabwe, and predict future hip fracture numbers up to 2051.
Results: In 2021 there were an estimated 212,830 women and 208,607 men aged $\geq$ 40 y living in Harare, equating to 16.2% of the city's population. Over 2 y we identified 243 hip fracture cases (133 [54.7%] female), mean (SD) age 71.2 (15.9) y, most presented to public hospitals (202[83.1%]), with a fragility fracture (210 [86.8%]). High-impact trauma, e.g., traffic accidents, was most common in younger men. In women, crude incidence per 100,000 person-years rose exponentially with age, reaching a rate of 1261.9 in those aged $\geq$ 80 y. By contrast, between 40-49 y, incidence was higher in men than women (11.3 vs. 1.2), the rate in men fell to match women at age 50-59, and then rose steadily with age to reach 900.6 in those age $\geq$ 80 y. From 2021 to 2051, the overall projected sex-specific age-standardised hip fracture incidence rate (per 100,000 adults age $\geq$ 40 in Zimbabwe) is estimated to increase for women (from 17.8 to 31.2) and men (from 11.3 to 26.4) (Fig. 1). The greatest increase is expected in women and men aged $\geq$ 80 y, with rates increasing from 20.8 to 33.9 for women and from 8.1 to 13.7 in men. Across Zimbabwe, the total number of hip fractures in adults aged $\geq$ 40 y is projected to increase from 813 in 2021 to 2172 by 2051.

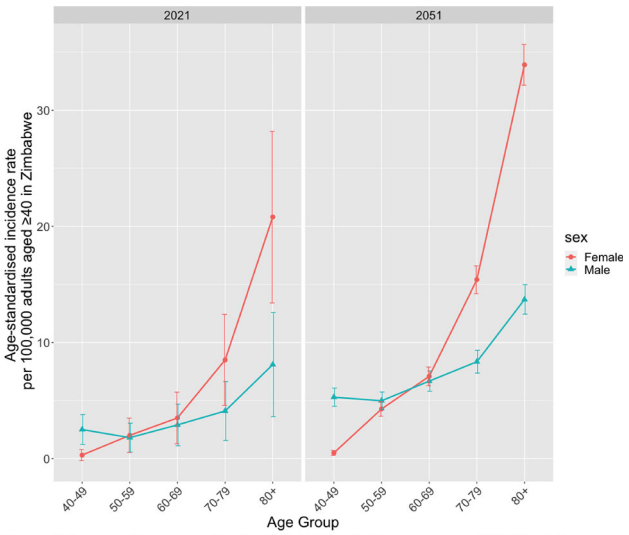


Figure 1. Sex-specific age-standardised hip fracture incidence rate per 100,000 adults age ≥40 y in Zimbabwe in 2021, with predicted rates in 2051.

Conclusion: Hip fracture incidence rates in Zimbabwe are similar to those previously reported in Black South Africans. The majority are fragility fractures, reflecting population ageing. Demands on an already over challenged healthcare system will increase; fracture services will need to respond.

P562
DISCORDANCE BETWEEN SPINE-HIP AND AFFECTED-UNAFFECTED HIP DXA AFTER STROKE: A MULTICENTER STUDY

H. Y. Lee[1], S. D. Yoo[2], J. Y. Lee[3], J. E. Son[4], S. A. Lee[4], T. W. Kim[1]

[1]Seoul National Univ. Hospital, Dept. of Rehabilitation Medicine, National Traffic Injury Rehabilitation Hospital, Dept. of Rehabilitation Medicine, Seoul, [2]Kyung Hee Univ. Hospital at Gangdong, Dept. of Physical Medicine and Rehabilitation, Kyung Hee Univ., Dept. of Medicine (AgeTech-Service Convergence Major), Seoul, [3]National Traffic Injury Rehabilitation Hospital, National Traffic Injury Rehabilitation Research Institute, Yangpyeong, [4]Kyung Hee Univ. Hospital at Gangdong, Dept. of Physical Medicine and Rehabilitation, Seoul, South Korea

Objective: Discordance between the lumbar spine (LS) and hip T-scores is sometimes observed based on the WHO T-score criteria, which can inhibit timely osteoporosis treatment. Bone loss, particularly in the paretic hip, can occur following stroke. Herein, we investigated the prevalence and risk factors of T-score discordance between the spine and hip as well as between the affected and unaffected hips in hemiplegic stroke patients.
Methods: This study was a multicenter retrospective analysis of 579 patients admitted for stroke rehabilitation between 2014–2022, who underwent DXA of LS and bilateral hips.
Results: The prevalence rates of concordance, low LS discordance, and low hip discordance between the hip and LS were 54.9%, 11.9%, and 33.2%, respectively. The discordance rate was 17.8% between the bilateral hips, and was all minor discordance. DXA scans of both hips and LS identified a minor discordance of 0.3% and major discordance of 0.9–1.2% between the spine and the hip that would have been missed owing to underestimation on LS and single-hip DXA scans. Hemiplegic stroke patients showed a higher prevalence of hip low discordance between the LS and hip than the general population. The analysis indicated that a duration of > 6 months after stroke was a significant risk factor for low hip discordance.
Conclusion: As stroke survivors are at high risk for hip fractures, more sensitive measures for identifying osteoporosis with DXA scans of both the hips and LS should be included in the standard management of post-stroke osteoporosis.

P563
UTILIZING DEEP LEARNING ALGORITHMS FOR THE DETECTION AND VISUALIZATION OF VERTEBRAL FRACTURES IN PLAIN RADIOGRAPHS

H.-Y. Chen[1], C. Soong[2], T.-H. Yang[3], R.-S. Yang[4]

[1]Dept. of Orthopedic Surgery, National Taiwan Univ. College of Medicine and National Taiwan Univ. Hospital, Taipei, [2]Institute of Biomedical Engineering, College of Medicine and College of Engineering, National Taiwan Univ., Taipei, [3]Dept. of Orthopedic Surgery, National Taiwan Univ. Hsin-Chu Hospital, Hsinchu, [4]Dept. of Orthopedics, National Taiwan Univ. College of Medicine and National Taiwan Univ. Hospital, Taipei, Taiwan

Objective: Detecting vertebral fractures (VFs) is crucial for effective secondary fracture prevention, as they are linked to higher risks of future fractures. Thoracolumbar Spinal Radiographs are routinely used for various clinical purposes and offer an excellent opportunity for the opportunistic identification of VFs. In this study, we employ a deep convolutional neural network (DCNN) to assess the potential of screening, detecting, and locating VFs using PARs.
Methods: DCNN was initially pretrained using the ImageNet dataset and then further retrained with 1000 thoracolumbar spinal radiographs images with 500 images in anterior-posterior view and 500 images in lateral view database, acquired between August 2015 and December 2018. Five pretrained CNN networks were used as feature extractors. To assess the model's performance, we evaluated its accuracy, sensitivity, specificity, and the area under the receiver operating characteristic curve (AUC). For model interpretation, we utilized the gradient-weighted class activation mapping (Grad-CAM) visualization algorithm.
Results: By employing various deep learning techniques and combining them with the ensemble method, the accuracy of identifying vertebral fractures significantly improved. The best performing ensemble strategy, which included all models, achieved high scores in evaluation metrics such as AUC, accuracy, recall, precision, and F1-score (AUC = 0.87, accuracy = 0.87, recall = 0.88, precision = 0.87, and F1-score = 0.87).
Conclusion: This study demonstrated the effectiveness of deep learning models in enhancing the accuracy of automatic vertebral fracture identification. Continued investigation and development of new model for detecting and diagnosing vertebral fractures are crucial as they have the potential to greatly impact public health and enhance the quality of life for patients.

P564
RISK FACTORS FOR MORTALITY, FRACTURES AND FALLS AMONG PATIENTS PARTICIPATING IN A FRACTURE LIAISON SERVICE PROGRAM: A MACHINE LEARNING APPROACH

R.-S. Yang[1], C. Soong[2], T.-H. Yang[3], H.-Y. Chen[4]

[1]Dept. of Orthopedics, National Taiwan Univ. College of Medicine and National Taiwan Univ. Hospital, Taipei, [2]Institute of Biomedical Engineering, College of Medicine and College of Engineering, National Taiwan Univ., Taipei, [3]Dept. of Orthopedic Surgery, National Taiwan Univ. Hsin-Chu Hospital, Hsinchu, [4]Dept. of Orthopedic Surgery, National Taiwan Univ. College of Medicine and National Taiwan Univ. Hospital, Taipei, Taiwan

Objective: The use of big data for disease prediction has been widely accepted in the fields of public health and healthcare services. This study employs computer learning models to identify the attributable risk factors associated with mortality, fractures and falls among patients participating in a fracture liaison service program.
Methods: Patient data for 600 cases with 112 characteristic fields were analyzed for prediction of "2-year dead," "2-year fracture," and "2-year fall". Model training and validation are conducted using k-fold cross-validation. Feature importance analysis using Recursive Feature Elimination with Cross-Validation (RFECV) selects the most influential features. Performance evaluation metrics such as accuracy, precision, sensitivity, specificity, F1-score, and AUC are utilized to assess the model's predictive abilities in disease diagnosis and classification.
Results: For "2-year dead," the Balanced Random Forest model is superior to the Random Forest model for handling imbalanced data, with better sensitivity, precision and F1-scores. Top 33 features were identified using RFECV as contributive to the classification target. For "2-year fracture," random undersampling performed better at improving the performance of the Balanced Random Forest model in handling extreme imbalanced data, compared to Synthetic Minority Oversampling Technique (SMOTE) and random oversampling. Top 31 contributory features were identified. For "2-year fall", the Balanced Random Forest model achieved better sensitivity and F1-score than the Random Forest model. 64 features were identified as significant predictors to whether a subject will experience a fall within 2 years.

Conclusion: The report demonstrates the importance of machine learning models, preprocessing techniques, and feature selection in disease classification. Addressing sample imbalance and utilizing appropriate evaluation metrics are crucial for accurate predictions. Future research should focus on improving the handling of imbalanced data and optimizing model performance.

P565
EPIDEMIOLOGICAL CHARACTERISTICS OF PATIENTS WITH POTENTIAL DECREASE OF MINERAL DENSITY BONE USING CLASSIC EVALUATION AND MUSCULAR ASSESSMENT

I. Abdula[1], L.-E. Stanciu[2], D. Iliescu[3], A.-D. Nedelcu[1], T. E. Iliescu[3], M.-G. Iliescu[4]

[1]Ovidius Univ. Faculty of Medicine Doctoral School. Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol, [2]Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol. Dept. of Medical Rehabilitation, Faculty of Medicine, Ovidius Univ. of Constanta, [3]Ovidius Univ. Faculty of Medicine, [4]Ovidius Univ. Faculty of Medicine Doctoral School. Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol. Dept. of Medical Rehabilitation, Faculty of Medicine, Ovidius Univ. of Constanta, Constanta, Romania

Objective: Our epidemiological study was conducted to demonstrate the importance of performing bone densitometry regardless of age, background, muscular status and the presence or absence of menopause.
Methods: We made an observational study, carried out by analyzing 100 patients from South-Est area of Romania, who visited the diagnostic center between November and December 2023, who were undergoing their first DXA analysis. Using the Primus Osteosys device, both bone density and body composition were assessed, determining also the risk of sarcopenia by evaluating the physiopathological muscular status.
Results: Following DXA analysis, of the 100 patients included in the study, 48% had osteopenia, 28% osteoporosis, 24% bone density within normal limits and 8% sarcopenia. Female patients predominated, despite the fact that these diagnoses may also be present in male patients. The patient population included 5% patients aged 50–60 y, 27% aged 50–60 y, 40% aged 60–70 y and 26% aged 70–80 y. Most importantly, 7% of patients were not menopausal and resulted in 5% with osteopenia and 1% with osteoporosis. Of the menopausal patients, 43% were diagnosed with osteopenia and 26% with osteoporosis. Also, the majority of the patients belonged to the urban environment, 72% and 28% to the rural environment.
Conclusion: This study could act as a framework for the design and the implementation of osteoporosis prevention interventions, making a real portrait of the patient in this area, with real impact in clinical practice.

P566
WHEN FEMURS LOSE THEIR HEADS

I. Almeida[1], L. Saraiva[1], I. Santos[1], M. Couto[1]

[1]Unidade Local de Saúde Viseu Dão-Lafões, Rheumatology Dept., Viseu, Portugal

Avascular necrosis (AVN) of the femoral head occurs due to the interruption of the vascular supply to the proximal femur, leading to bone ischemia. It can result from traumatic or non-traumatic systemic conditions and, if left untreated, ultimately leads to femoral head collapse and secondary hip osteoarthritis. Glucocorticoids (GC) and chronic alcohol abuse are the most frequently reported nontraumatic causes. Smoking is considered to be correlated with AVN. A non-operative management is recommended for patients in early precollapse stages, while advanced stages require surgical treatment.

Case report: A 55-year-old man, with undifferentiated spondylarthritis for 10 y, taking prednisolone 5 mg/d, calcium 1500 mg/d, vitamin D 880 U/d and acemetacin 90 mg on demand, had been complaining of hip pain for 3 months. The pain radiated to the groin and was briefly relieved with analgesics and nonsteroidal anti-inflammatory drugs. The patient also had a history of alcohol abuse and a smoking history of 40 pack-years. The pelvic X-ray showed severe irregularities in the femoral heads with sclerosis and collapse of the articular surface, corresponding to avascular necrosis at stage IV of the ARCO staging system (Fig. 1). The dose of GC was reduced and the patient underwent total hip arthroplasty.

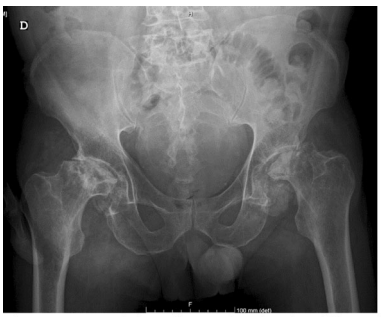


Figure 1. AP pelvic radiography showing bilateral femoral head avascular necrosis

Discussion: AVN resulting from GC therapy manifests in up to 38% of patients and exhibits a dose-dependent relationship. There are few case reports related to low dose of GC ($\leq$ 5 mg prednisone equivalent per day). In this case, the long-term therapy, the history of alcohol abuse and smoking might have increased the risk, ultimately contributing to the occurrence of AVN.
Conclusion: In a patient undergoing GC therapy, even at a low dose, hip pain of recent onset should raise the suspicion of AVN. If feasible, GC administration should be discontinued; alternatively, the dosage should be reduced. Evaluation by an orthopaedic surgeon is essential to assess the need for surgical intervention.

P567
OSTEOMALACIA MISDIAGNOSED AS OSTEOPOROSIS: A CASE REPORT

I. Almeida[1], L. Saraiva[1], M. Couto[1]

[1]Unidade Local de Saúde Viseu Dão-Lafões, Rheumatology Dept., Viseu, Portugal

Osteomalacia is a metabolic bone disease characterized by deficient mineralization of the bone matrix. Crohn's disease (CD) can impair nutrient absorption, either by inflammation of the intestinal mucosa or by the reception of segments of the small intestine. This can lead to deficits in phosphate (P), calcium (Ca) and vitamin D (vit D) that predispose to metabolic bone disease.
Casereport: A 56-year-old man, diagnosed with CD since the age of 15, with a history of 3 ileocecal resections, high cumulative dose of glucocorticoids and multiple intravenous therapies with ferric carboxymaltose, presented with nonspecific complaints of musculoskeletal pain. Bone scintigraphy revealed multiple foci of dispersed hyperuptake, suggestive of multiple fragility fractures of cervical and dorsal vertebrae, costal arches and lesser trochanter, confirmed by CT. Bone densitometry showed a femoral neck T-score of -2.7, and bisphosphonates were started. Due to worsening

musculoskeletal pain and muscle weakness, he was referred to our rheumatology department. Clinical analyses revealed P 1.0 mg/dL (2.3–3.7), Ca 9.2 mg/dL (8.7–10.4), alkaline phosphatase (ALP) 251 IU/L (25–100), PTH 193.7 pg/mL (18.50–88.00), vit D 18.9 ng/mL (30.0–95.0) and tubular P reabsorption rate 59% (78–98%). Ultrasound showed no nodular formations in the parathyroid glands. He started phosphate and calcitriol supplementation and stopped bisphosphonates. After 4 months of therapy, there was clinical and analytical improvement: P 1.4 mg/dl; ALP 210 IU/L; PTH 204 pg/mL; vit D 28.6 ng/mL. The supplementation dosage was adjusted.

Discussion: In this case, hypophosphataemia resulted from several factors: poor intestinal absorption; ferric carboxymaltose therapy causing increased FGF23 and subsequent renal P wasting; vit D deficiency with secondary hyperparathyroidism amplifying renal P excretion.

Conclusion: Fragility fractures in a patient with low BMD do not equate to osteoporosis. A complete bone metabolism study for accurate diagnosis and appropriate treatment is essential, especially in the presence of pathologies that compromise nutrient absorption.

P568
EFFECT OF THE CONSUMPTION OF BIOACTIVE COMPOUNDS (VITAMIN C, D3, CA, POLYPHENOLS) ON BONE METABOLISM INDICES IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS' RISK: A PROSPECTIVE STUDY

M. Konstantinidi[1], I. Anastasiou[2], Stavroula Stoupi[3], NikolaosVlachos[4], George Tsakotos[5], Antonios Koutelidakis[1]*

[1]Laboratory of Nutrition and Public Health, Unit Of Human Nutrition, Department of Food Science and Nutrition, University of the Aegean, 81400, Myrina, Lemnos, Greece, [2]Orthopedic Clinic, Agiou Georgiou 51 Korydallos, Greece, [3]Department of Dietetics, School of Health, Metropolitan College, 74 Sorou st., Marousi, [4]Orthopedic Clinic, Athens Medical Group, Antersen 1 Psychic, Greece, [5]Orthopedic Clinic, Kyprou 1, Tripoli Arcadias, Greece

Objective: The evaluation of possible changes in biomarkers of bone metabolism and in bone density in postmenopausal women, with high risk of osteoporosis, followed by a nutritional intervention program.

Methods: It was a prospective randomized controlled trial with 115 postmenopausal women with decreased bone density, aged 45-75 y. The women randomized into four interventional groups: (I) group (n = 40) received daily 1000 mg vitamin C, 500 mg vitamin D_3, 500 mg calcium (Ca) and 300 mg magnesium (Mg), (II) group (n = 42) received daily 500 mg vitamin D_3, 500 mg Ca and 300 mg (Mg), (III) group (n = 18) received daily 150 mg bisphosphonates, 500 mg vitamin D_3, 500 mg Ca and 300 mg (Mg) and (IV) group (n = 15) received daily 364 mg polyphenols via an innovative functional food (50 g olive paste enriched with mountain tea extract) along with 500 mg vitamin D_3, 500 mg Ca and 300 mg Mg. Groups I-III received supplementation for one year whereas group IV for 5 months. Changes in calciregulatory PTH were evaluated at the beginning of the study as well as at 5 and 12 months intervals. Blood levels of vitamin D, vitamin C, Ca, Mg and the lipid profile were assessed at the beginning and at the end of the study. Bone density were evaluated with DXA at the beginning and at the end of the study. Statistical analysis was performed with IBM-SPSS Statistics 21 with level of statistical significance at $p < 0.05$.

Results: Vitamin D levels were improved, in groups II, III and IV, while PTH levels were increased for groups I and IV at the end of the intervention period. Significant positive changes recorded in bone density, in all four study groups. Significant beneficial changes on total cholesterol was observed in group IV and on HDL-Cholesterol in group I.

Conclusion: More clinical and epidemiological studies are needed for further investigation of the role of specific bioactive compounds on bone metabolism.

P569
EFFECT OF TYPE OF FAT DISTRIBUTION ON SEVERITY OF OSTEOARTHRITIS OF KNEE JOINTS

I. Bashkova[1], I. Madyanov[2]

[1]Chuvash State Univ. named after I.N. Ulyanov; Federal Center for Traumatology, Orthopedics and Arthroplasty (Cheboksary), [2]Chuvash State Univ. named after I.N. Ulyanov; Institute for the Improvement of Doctors, Cheboksary, Russia

Objective: To evaluate the association of fat distribution patterns with the course of primary knee osteoarthritis (OA).

Methods: We examined 91 patients (22 men) with a reliable diagnosis of primary knee OA (the clinical group) according to ACR criteria. The average age of patients was 54 [50; 58] y, duration of OA—7 [4; 12] y. Anthropometric examination, assessment of joint pain by VAS, Lequesne index, WOMAC, radiographic and arthrosonographic examination of knee joints were performed. The type of fat distribution—abdominal (AO) or gluteofemoral (GFO) obesity—was judged by waist circumference and waist to hip circumference ratio index. The control group was formed from 114 practically healthy individuals and was representative of the age and sex composition of the clinical group.

Results. The mean value of BMI in OA patients was 28.6 ± 5.8 kg/m^2 and was not significantly higher than in the control group—27.6 ± 4.5 kg/m^2. BMI increase was directly related to the increase in the size of osteophytes ($r = 0.434$, $p = 0.003$) and inversely correlated with the width of the X-ray articular gap ($r = -0.373$, $p = 0.014$). It appeared that it is not obesity itself, but the nature of its distribution that is of greater importance for OA. If in AO pronounced radiologic changes (III, IV stages according to Kellgren) were found in every 4th patient (26.4%), in GFO—in none of the cases ($p\chi^2 = 0.037$). Synovitis was significantly more frequent in AO than in GFO (43.4 vs. 7.1%, $p\chi^2 = 0.028$), morning stiffness was longer (24.5 ± 9.1 vs. 18.1 ± 0.3 min, $p < 0.05$), C-reactive protein level was higher (10.4 ± 1.5 vs. 6.9 ± 1.4 mg/L, $p < 0.01$). In patients with abdominal type, the severity of joint pain on loading was 33.3% higher than in patients with GFO type ($p < 0.001$), total Lequesne and WOMAC indices were 27.2% ($p < 0.05$) and 20.1% ($p < 0.05$) higher, respectively. The articular cartilage thickness of the medial tibial condyle was less in patients with AO (1.48 ± 0.48 vs. 1.91 ± 0.35 mm, $p < 0.05$). The probable negative impact of abdominal fat redistribution on the course of OA may be indicated by the positive association of waist circumference with VAS pain severity ($r = 0.238$, $p = 0.024$), Lequesne index ($r = 0.443$, $p = 0.027$), radiologic stage of OA ($r = 0.467$, $p = 0.019$) and osteophyte size ($r = 0.364$, $p = 0.012$).

Conclusion: Abdominal obesity is associated with a more severe course of OA than GFO obesity. Visceral obesity is characterized by more pronounced inflammatory, arthrosonographic and radiological changes in the joints, which is important to consider in the treatment of this category of patients.

P570
ASSESSMENT OF INDIVIDUAL RISK OF BONE FRACTURES IN PATIENTS WITH CLINICALLY MANIFEST PAGET'S DISEASE

I. Bashkova[1], N. Bezludnaya[2]

[1]Chuvash State Univ. named after I.N. Ulyanov; Federal Center for Traumatology, Orthopedics and Arthroplasty (Cheboksary), [2]Federal Center for Traumatology, Orthopedics and Arthroplasty (Cheboksary), Cheboksary, Russia

Objective: To assess individual 5-y bone fracture risk, risk of recurrent fracture, and estimated "skeletal age" in patients with clinically manifest Paget's disease (PD).
Methods: The study included 26 patients (14 of them were men) with clinically manifest form of PD. The median age of the patients was 59.5 [54; 73] y. The diagnosis of PD was established on the basis of characteristic radiologic picture and increased activity of alkaline phosphatase (ALP) in blood serum. BMD of axial skeletal sections was determined using a Lunar DPX X-ray osteodensitometer. When analyzing the densitograms, the BMD values of vertebrae or femoral neck were excluded if zones of bone tissue remodeling were detected in them. The individual 5-y risk of bone fractures, risk of recurrent fractures, and estimated skeletal age were estimated using the BONEcheck® digital tool, and the 10-y probability of low-energy fractures was estimated using the Russian model of the FRAX® calculator.
Results: The median age of clinical manifestation of PD was 53 [41; 63] y. In 76.9% of cases there was a late diagnosis of the disease—on average 7 [3; 10] y after the appearance of the first clinical symptoms. Only 6 patients (23.1%) were diagnosed in the first 2 y of the disease. At the time of diagnosis verification, the polyosseous form of the disease was diagnosed in 84.6% of patients, whereas the monosseous form was diagnosed in only 15.4% of cases, which may be related not only to the peculiarities of the course of the disease, but also to its late diagnosis. Peripheral skeletal bones were affected in 18 patients (69.2%), axial skeletal bones in 5 patients (19.2%), simultaneous lesions of the axial skeleton and pelvic girdle bones in 3 patients (11.6%). In serum of all patients with PD at the time of diagnosis, an increase in alkaline phosphorus activity was detected, exceeding the upper limit of the reference interval on average 3 times. The average values of alkaline phosphate activity amounted to 475 [296; 1211] U/L. The average content of total calcium in blood in PD patients was 2.40 [2.24; 2.45] mmol/l. According to osteodensitometry, the mean T-criteria values in the lumbar spine (LBP) were − 2.8 [− 4.1; − 0.8] CO and in the neck of femur were − 2.0 [− 3.6; − 1.2] CO. Osteopenic syndrome was detected in 79% of PD patients: osteoporosis (58%), osteopenia (10.5%), and decreased BMD below age normal in men under 50 y of age (10.5%). The 10-y probability of major osteoporotic fractures and fractures of femoral neck calculated with the FRAX® calculator in PD patients was 9.2 [5.5; 20]% and 1.9 [0.7; 11]%, respectively. While the 5-y risk of any fracture and hip fracture determined in patients aged 50 y and older using the BONEcheck® tool was higher at 14 [6; 42.5]% and 3.5 [1; 24.5]%, respectively. The mean rates of predicted risk of subsequent fractures in PD patients were found to be 14.5 [8.5; 22]%. The mean estimated "skeletal age" was 70.5 [60.2; 78.0] y and was 8.8% higher than the chronologic age (64.5 [55; 74] y) of patients in whom the BONEcheck® calculation tool was used. Almost every 2nd patient with PD (46.2%) had a history of pathologic fractures. Compression fractures of vertebral bodies were detected in 7 patients, fractures of the proximal femur in 4 patients, pelvic bones in 2 patients, surgical neck of the humerus in 1 patient. In 8 out of 12 patients with a history of low-energy fractures, the latter were multiple or there was an indication of repeated fractures of one bone. A single infusion of zoledronic acid in the dose of 5 mg not only promotes normalization of alkaline phosphorus level, but also leads to a significant increase in BMD according to the densitometry data performed in a year. However, a single parenteral administration of zoledronic acid may not be sufficient to prevent primary and recurrent fractures in PD patients. Since PD patients, even in the absence of a history of fracture, have a mean 5-year risk of primary fractures of 6 [3; 27]%, and with effective pathogenetic treatment, the risks are probably not eliminated in all patients—2 [0; 14.5]%.
Conclusion: Osteopenic syndrome is a frequent complication of clinically manifest PD (detected in 79% of cases). The predicted 5-y risk of bone fractures in PD patients was high and amounted to 14 [6; 42.5]%. Almost every 2nd patient had a history of pathologic fractures. The calculated risks of recurrent fractures were also quite high (14.5 [8.5; 22]%). Due to the high individual risks of bone fractures, life expectancy in a number of PD patients may be on average 6 years shorter due to bone fractures or exposure to risk factors that increase the likelihood of fracture.

P571
EVALUATION OF THE SAFETY SKILLS OF PATIENTS WITH BIOLOGICAL DMARDS AFTER A THERAPEUTIC PATIENT EDUCATION PROGRAM

I. Bencharif[1], D. Bendjenna[2], Y. Kitouni[1], A. Ladjouze-Rezig[3]

[1]Univ. of Constantine, Constantine, [2]Hospital Benbadis of Constantine, Constantine, [3]Univ. of Algiers, Algiers, Algeria

Objective: Biological DMARDs (bDMARDs) are well known cause a number of specific complications, including infectious ones. Patients receiving bDMARDs must know them and acquire self-care and safety skills in order to take charge of themselves in risky situations. This is only possible thanks to therapeutic patient education (TPE) programs in chronic Inflammatory arthritis such as rheumatoid arthritis (RA), spondyloarthritis (SpA) and psoriatic arthritis (PsA). We aimed to evaluate the impact of the therapeutic patient education program "EST-RIC" on the safety skills in patients treated with bDMARDs and on clinical parameters (Disease activity scores, compliance, number of infectious events, number of treatment stops, vaccination rate).
Methods: Nonrandomized clinical trial comparing the knowledge and safety skills between two cohorts of patients with RA, SpA or PsA receiving bDMARDs for at least three months in the day hospital center of CHU of Constantine: group TPE (patients joined the "EST-RIC" therapeutic education program) vs. group TPE-naive (patients who did not wish to participate).The primary outcome was the acquisition of safety skills at 3 and 6 months measured by the Biosecure questionnaire (0–100 scale), a 55 item validated questionnaire assessing competences to deal with fever, infections, vaccination, and other daily life situations [1]. The secondary outcomes were disease activity scores (DAS 28 for RA and BASDAI for SpA) at 6 months, compliance (Morisky score), number of infectious events, number of treatment stops, vaccination rate at 12 months.
Results: 450 patients were included, with mean age 41.6 ± 12.1 years old; 235 (52.2%) women; 192 (42.7%) had RA; mean disease duration 9.9 ± 6.6 y, 269 (60%) received subcutaneous bDMARDs. 240 patients in group TPE vs. 210 patients in group TPE-naive. The median Biosecure score was significantly higher in the group TPE than in the group TPE-naive (75.7/100 vs. 57.9/100; $p < 0.001$) at 6 months. There was a significant difference in disease activity scores: DAS28 and BASDAI, in rates of vaccination and discontinuation of treatment by forgetfulness. Regarding the observance to treatment or incidence of infectious events, there was no significant difference between the groups TPE and TPE-naive.
Conclusion: Safety is an important issue in the management of inflammatory arthritis treated with bDMARDs. In this trial,

therapeutic patient education improves knowledge and safety skills of arthritis patient receiving bDMARDs, and disease activity scores.
Reference: (1) Gossec, et al. Joint Bone Spine 2013;80:471

P572
BISPHOSPHONATES IN (MONA) SPECTRUM DISORDER

I. Bencharif[1], D. Bendjenna[2], Y. Kitouni[1]

[1]Univ. of Constantine, [2]Hospital Benbadis of Constantine, Constantine, Algeria

Objective: Multicentric osteolysis, nodulosis and arthropathy (MONA) spectrum disorder is a rare inherited progressive skeletal disorder caused by mutations in the matrix metalloproteinase 2 (MMP2) gene. It characterized by multiple peripheral osteolysis, wide metacarpals, osteoporosis, progressive joint contractures, short stature, subcutaneous nodules as well as a coarse face, skin lesions/ hirsutism and ocular and cardiac manifestations. The diagnosis is based on the typical clinical features together with normal laboratory findings, which allow this disease to be distinguished from other syndromes, including fibrotic, rheumatic and lysosomal diseases. Treatment options are limited. Bisphosphonates in (MONA) spectrum disorder may be an alternative therapeutic approach.
Methods: We present successful bisphosphonate therapy in two affected sisters, A.N, 10-year-old and A.I, 7-year-old, presented with history of fractures of their long bones after trivial traumas with progressive painful deformities in hands and feet with limitation motion. They were treated with bisphosphonates (intravenous zoledronate every 6 months). The following outcome variables were assessed: skeletal pain, range of motion, internal medical problems as well as neurocognitive function.
Results: Skeletal pain was reduced soon after initiation of therapy. Range of motion did not significantly improve. Neurocognitive development was normal. No further low-impact fractures occurred after starting bisphosphonate therapy. Although the nature of the disease is progressive, they are still able to walk and use their hands for writing.
Conclusion: Bisphosphonate therapy was effective especially in controlling skeletal pain and reducing fractures in MONA spectrum disorder. Early initiation of treatment seems to be particularly important in order to achieve the best possible outcome.

P573
MANAGEMENT OF A PATIENT WITH RHEUMATOID ARTHRITIS ASSOCIATED WITH SICKLE CELL DISEASE AND HEPATITIS C

I. Bencharif[1], D. Bendjenna[2], Y. Kitouni[1]

[1]Univ. of Constantine, [2]Hospital Benbadis of Constantine, Constantine, Algeria

The occurrence of rheumatoid arthritis in patient with sickle cell disease (hereditary genetic disease affecting red blood cells called hemoglobinosis s) has diagnostic, therapeutic and prognostic consequences. We aimed to show the complexity of the management of rheumatoid arthritis associated with sickle cell disease and hepatitis c when most drugs are contraindicated.

We report a case observed in a 32-year-old woman with a history of hepatitis c, who presents with deforming rheumatoid arthritis at the stage of bilateral fusing carpitis. The terrain and the different repercussions of the two conditions made the patient management complex. Indeed, corticosteroid therapy is contraindicated in the event of a flare-up of rheumatoid arthritis since it risks triggering a vaso-occlusive crisis of sickle cell disease which can be fatal. Hepatitis C contraindicates the use of disease-modifying treatments for rheumatoid arthritis. Consultation between hematologist, hepatologist, rheumatologist and infectious disease specialist was necessary to choose the appropriate treatment and achieve remission.

P574
DENSITOMETRIC PROFILE OF PATIENTS WITH OSTEOPOROTIC RISK FACTORS

I. Bencharif[1], T. Khaled[2]

[1]Univ. of Constantine, [2]Private rheumatology practice, Constantine, Algeria

Objective: Bone densitometry (DXA) measurement currently constitutes the most accurate diagnostic approach to osteoporosis. The precise indications for DXA are still debated. Indeed, the distribution of DXA values observed in fractured subjects and that observed in matched controls largely overlap, which shows that factors other than BMD play a role in determining osteoporotic fractures. This is the reason why the indications for bone densitometry are based on the existence of osteoporosis risk factors. We aimed to identify the densitometric profile of patients with osteoporotic risk factors.
Methods: This is a descriptive study of the results of bone densitometry carried out following requests from the rheumatology, orthopedics, endocrinology, oncology and internal medicine departments. Patients who underwent DXA with at least one osteoporosis risk factor were included.
Results: Of 250 patients seen, 123 presented with osteoporosis. 90.1% were women. The average age was 62.1 y; that at menopause was 47.2 y. The average BMI was 27.8 kg/m^2. 75% of patients had more than 2 major risk factors for osteoporosis: Personal or family history of fracture (38.5%), corticosteroid therapy (22.3%), anti-aromatase treatment (15.1%) and 30% had suffered at least one fall. 28.7% of patients presented at least one vertebral fracture, and 16.8% peripheral fractures: femoral neck fractures (8), wrist fractures (24), ankle fractures (7), rib fractures (3). 19.5% of patients had a delay of more than 10 years between their fracture and the performance of DXA. 60.2% of osteoporotic patients had a T-score < -2.5 at at least one site and 39.8% had a T-score < -3. 47.2% of patients were referred by rheumatologists, followed by oncologists (17.5%).
Conclusion: Risk factors for falls and osteoporosis must be sought in elderly people. Low-energy fractures can occur in non-osteoporotic patients.

P575
EPIDEMIOLOGICAL PROFILE AND CHARACTERISTICS OF GONARTHROSIS IN EASTERN ALGERIA

I. Bencharif[1], T. Khaled[2]

[1]Univ. of Constantine, [2]Private rheumatology practice, Constantine, Algeria

Objective: Gonarthrosis is one of the preferred sites of degenerative cartilage disease, which is particularly common in the elderly and can lead to incapacity and disability. It represents a public health problem. The Algerian population is increasingly exposed to symptomatic forms of gonarthrosis due to the growing ageing of the population. We present the epidemiological profile and characteristics of gonarthrosis in eastern Algeria.
Methods: A descriptive cross-sectional study was carried out over a 2-y period (January 2021-January 2023), including patients with gonarthrosis defined according to ACR criteria, seen in rheumatology (private and public). Data on the epidemiological profile and

characteristics of the patients were collected. We excluded patients who had received surgical treatment for their gonarthrosis.
Results: 582 patients were included. The mean age was 64.2 ± 9.2 y, with a sex ratio of 3.5 F/H. The mean duration of the disease was 8.6 ± 5.6 y. The duration of the disease varied, ranging from 1–45 y, with an average of 14.1 ± 14.8 y. In terms of medical history, the main chronic diseases reported and monitored were, in descending order of frequency, arterial hypertension (47.4%), followed by diabetes (34.1%), hypothyroidism (10.2%) and ischaemic heart disease (7.8%). Apart from the knee, 78.4% of patients had a secondary location: lumbar spine, cervical spine and hands. There was only one case of osteoarthritis of the hip and one case of omarthrosis. The average BMI was 29.9 ± 3.8 kg/m^2. Kellgren–Lawrence radiographic grade 3 was the most common (41.4%), and the mean total WOMAC score was 73.3 ± 11.8. With regard to previous treatments, 99.1% of patients reported having taken painkillers, 97.4% had taken non-steroidal anti-inflammatory drugs and 3.8% had taken a corticosteroid. Regarding slow-acting anti-arthrosic treatments, 37.9% had already received them. Finally, 24.4% had corticosteroid infiltration in the knees and 34.7% viscosupplementation.
Conclusion: In eastern Algeria, gonarthrosis is predominantly female, rather advanced and rarely isolated. Hip and shoulder involvement is almost nonexistent. Few patients benefit from local treatments or anti-arthrosic agents.

P576
EVALUATION OF MEDICAL PARAMEDICS' KNOWLEDGE OF BIOLOGICS: A REVIEW OF THE SITUATION IN EASTERN ALGERIA

I. Bencharif[1], D. Bendjenna[2]

[1]Univ. of Constantine, [2]Hospital Benbadis of Constantine, Constantine, Algeria

Objective: Biologics are now an essential part of the management of systemic diseases, whether autoimmune or auto-inflammatory. It is essential that paramedical staff have adequate knowledge of these molecules (indications and contraindications, elements of the pre-therapeutic assessment, monitoring elements and adverse effects) in order to facilitate the management of patients with biologics.
Methods: We conducted a cross-sectional, descriptive study to assess the skills of nurses working in day hospitals where biologics are prescribed using a validated questionnaire aimed at assessing knowledge of biologics.
Results: 73 nurses responded to the questionnaire, 39 women (53.4%) and 34 men (46.6%), the average age was 32 y (22–52 y) with a length of practice of 12.7 y, they worked in the departments of internal medicine (42.4%), rheumatology (26.5%), gastroenterology (18.6%) and dermatology (12.5%). The median score was 75.7/100 (IQR: 70.9–78.7). By analysing the different skills, i.e., the 55 items making up the dimensions of the questionnaire, all the paramedical staff questioned had answered correctly the question relating to premedication, the route and method of administration of the biotherapy and the storage methods for the different biotherapies. The skill dimensions which it is desirable to know about, but which should be emphasised, are in particular the skills relating to the management of fever and wounds. Skills relating to communication, symptoms requiring consultation and vaccination were well mastered. The skills least well mastered were contraception on biologics, dental care and planning surgery. 49.5% felt they had insufficient training in biologics. Most wanted to join a continuing professional development programme.
Conclusion: Assessment of paramedics' knowledge of biologics is far from optimal. It is crucial to take concrete action to improve this situation through regular continuing professional development sessions, while ensuring that initial programmes include theoretical and practical training based on current recommendations.

P577
CHARACTERISTICS OF PATIENTS TREATED WITH DENOSUMAB IN DAY HOSPITALS

I. Bencharif[1], D. Bendjenna[2]

[1]Univ. of Constantine, [2]Hospital Benbadis of Constantine, Constantine, Algeria

Objective: Denosumab (Dmab) is a human monoclonal antibody (IgG2) that targets RANKL and is the 1st biologic against osteoporosis. It was introduced in Algeria in 2015. According to the updated SFR/GRIO 2016 recos, the use of parenteral drugs (zoledronic acid, denosumab: reimbursed in 2nd line after bisphosphonates) can be preferred in the following situations fractures of the upper end of the femur (FESF), very low initial BMD, presence of comorbidities and in particular memory disorders, lack of observance and polypharmacy, the characteristics of the population taking Dmab, the place of Dmab in the therapeutic arsenal for osteoporosis
Methods: Retrospective study on records conducted in 2 centers: CHU Constantine, CHU Batna. Were included all patients who received Dmab from Jan 2017 to Jan 2018, the characteristics of the population were collected: age, sex, profession, BMI, duration of osteoporosis, associated pathologies, risk factors for osteoporosis, fall, calcium and vitamin D diet, initial BMD, phosphocalcic balance, initial vit D and PTH, previous anti-osteoporotic treatments, tolerance to denosumab, treatment discontinuations, occurrence of new fractures
Results: The characteristics of the population (24 patients): Sex (F/M) (23 M/1), mean age (y) = 67.04 ± 9.85 (36/87), diagnosis date (y) = 3.83 ± 4, 56 (0/10), BMI (kg/cm^2) 25.43 ± 6.15 (16/38) Initial biological assessment: serum calcium: 92 ± 5.54 mg/l (86–108), PAL: 98.78 ± 44.01 (43–170), PTH: 68.33 ± 51.34 (12–167), 10 patients who had no prior treatment had a history of fracture (N = 17), 5 of these patients had several fractures.
Conclusion: Osteoporosis is underdiagnosed, untreated. Dmab is prescribed in severe fractured osteoporosis, often as first-line treatment. The very low BMD < -3 conditions the start of the Dmab. Osteoporosis should be sought in asthmatics and priority should be given to dietary calcium intake and physical activity. Dmab has a good tolerance profile.

P578
OPINION OF HOSPITAL AND PRIVATE PRACTICE RHEUMATOLOGISTS REGARDING BIOSIMILARS

I. Bencharif[1], D. Bendjenna[2]

[1]Univ. of Constantine, [2]Hospital Benbadis of Constantine, Constantine, Algeria

Objective: bDMARDs are widely used in rheumatoid arthritis, and their cost is high. The expiration of patents for the first bDMARDs and development of (bs)DMARDs that arrived on the Algerian, 2 y ago. We assessed the opinion of rheumatologists in hospitals and private practice regarding biosimilars.
Methods: We conducted a survey of rheumatologists in hospitals and private practice regarding biosimilars using a self-administered electronic questionnaire distributed by e-mail.
Results: We showed a need for rheumatologists to have more knowledge and experience of bsDMARDs: More than half of rheumatologists know. Although rheumatologists' knowledge of bsDMARDs may vary from "a little" to "well", the survey enabled

them to gain a better understanding of the fears and questions that remain in the field, concerning substitution, tolerance, iatrogenicity and extrapolation.
Conclusion: Rheumatologists are convinced that savings can be made. A strategy for using and monitoring the first biosimilars to arrive in Algeria needs to be considered.

P579
PREVALENCE OF NEUROPATHIC PAIN IN GONARTHROSIS

I. Bencharif[1], F. Touati[1]

[1]Univ. of Constantine, Constantine, Algeria

Objective: Pain is a ubiquitous symptom in gonarthrosis and is generally considered to be nociceptive in nature. However, pain in osteoarthritis is a specific pathology with a complex pathophysiology including peripheral and central neuropathic abnormalities and local inflammation affecting all joint structures. Receptors involved in neuropathic pain have recently been observed in the joints. The aim of our study was to determine the prevalence of neuropathic pain in patients suffering from gonarthrosis and to evaluate its association with the clinical and radiological profile of the patients.
Methods: This was an observational, cross-sectional study of patients presenting to a rheumatology consultation with gonarthrosis diagnosed according to the gonarthrosis classification criteria of EULAR. Patients with a neurological pathology that could alter the assessment of the neuropathic component were excluded. Neuropathic pain was defined as a DN4 score ≥ 4.
Results: Of 120 patients (77% female) included, 90 had bilateral involvement. The mean age was 57 ± 10.8 y, the mean BMI was 29.3 ± 4.7, and the duration of gonarthrosis was 6.8 ± 5.7 y. Neuropathic pain was found in 33.5% of the arthrosic patients assessed. These patients had more intense pain (high VAS) and greater structural damage (more advanced Kellgren-Lawrence radiographic grade).
Conclusion: Osteoarthritis patients with a probable component of peripheral neuropathy, as determined with the DN4 questionnaire, may represent a specific phenotype of osteoarthritis and should benefit from specific treatment.

P580
SCREENING FOR FIBROMYALGIA IN SPONDYLOARTHRITIS

I. Bencharif[1], F. Touati[1]

[1]Univ. of Constantine, Constantine, Algeria

Objective: Fibromyalgia is a common chronic pain syndrome combining chronic diffuse musculoskeletal pain (for more than 3 months), fatigue and sleep disorders. It is associated with a variety of other functional symptoms, including cognitive problems and a feeling of waking up without rest. This syndrome is due to altered processing of nociceptive impulses in the nervous system. The prevalence of fibromyalgia appears to be higher in chronic inflammatory rheumatic diseases, particularly spondyloarthritis. The aim of this study was to estimate the prevalence of fibromyalgia in spondyloarthritis.
Methods: A cross-sectional, descriptive study including patients with spondyloarthritis diagnosed according to the ASAS (Assessment of SpondyloArthritis international Society) criteria and who had completed the FiRST (Fibromyalgia Rapid Screening Tool) questionnaire. This consisted of 6 questions graded 0 or 1. A fibromyalgia was considered for any score ≥ 5. I
Results: 60 patients were included, 8 women and 52 men (86.7%), mean age 43.8 ± 9.7 y, HLA B27 positive in 29 patients (48.3%), mean duration of spondyloarthritis 16.2 ± 9.4 y, disease activity assessed by BASDAI score 4.5 ± 2.5. Anti-TNFα therapy was prescribed in 34 patients (56.7%). A score ≥ 5 indicating fibromyalgia was found in 19 patients (31.6%).
Conclusion: In agreement with the data in the literature, this study confirms the coexistence of fibromyalgia and spondyloarthritis, which could make it more difficult to assess disease activity. In practice, screening for fibromyalgia should be systematic in order to ensure appropriate therapeutic management

P581
CONTENT, STRUCTURE, AND DELIVERY CHARACTERISTICS OF EFFECTIVE YOGA INTERVENTIONS FOR MANAGING OSTEOARTHRITIS SYMPTOMS: A SYSTEMATIC REVIEW AND META-ANALYSIS

I. Biswas[1], G. Nalbant[1], S. Lewis[1], K. Chattopadhyay[1]

[1]Univ. of Nottingham, Nottingham, UK

Objective: To synthesise content, structure, and delivery characteristics of effective yoga interventions for managing osteoarthritis symptoms.
Methods: JBI systematic review methodology was followed. 17 databases were searched for randomised controlled trials (RCTs) that assessed yoga's effectiveness in osteoarthritis (i.e., on pain or function). Meta-analyses and a narrative synthesis were conducted to address the objective.
Results: 18 and 16 articles (representing 16 and 14 RCTs) were included in the systematic review and meta-analysis, respectively. Overall, the included studies had low methodological quality scores. 10 of 14 interventions were effective in reducing pain (SMD -0.70; 95% CI -1.08, -0.32) and/or improving function (-0.40; -0.75, -0.04). 6 effective interventions had centre-based (supervised, group) sessions with additional home-based (unsupervised, individual) sessions. Effective interventions included 34 different yogic poses (10 standing, 12 sitting, 4 prone, 8 supine), 8 breathing practices, and 3 meditation and relaxation practices, and all three major yoga components were included in 3 interventions. To address participants' needs (e.g., physical limitations), yogic poses were adapted in 4 interventions. The median duration of centre-based sessions was 8 weeks (IQR 8–11 weeks) and each session was around 53 min (IQR 45–60 min), mostly delivered once a week. The median duration of home-based sessions was 10 weeks (IQR 8–12 weeks) and each session was 30 min (IQR 29–30 min), mostly delivered 4 times a week. Strategies were used to monitor and improve adherence to home practice e.g., self-recorded diaries and videos, telephone calls, and email reminders.
Conclusion: Given previous studies' limitations, a high-quality RCT should be conducted using synthesised content, structure, and delivery characteristics of previous effective yoga interventions for osteoarthritis.

P582
IRISIN, TROLOX AND RESVERATROL: A POTENTIAL ANTI-SENESCENCE COCKTAIL TO REPRODUCE THE EFFECTS OF A HEALTHY LIFESTYLE AND COUNTERACT THE PROGRESSION OF OSTEOPOROSIS

I. Cariati[1], R. Bonanni[2], A. Falvino[2], B. Gasperini[2], A. Chiavoghilefu[3], R. Iundusi[3], E. Gasbarra[3], V. Tancredi[1], U. Tarantino[4]

[1]Dept. of Systems Medicine, "Tor Vergata" Univ. of Rome, [2]Dept. of Biomedicine and Prevention, "Tor Vergata" Univ. of Rome, [3]Dept. of Orthopaedics and Traumatology, "Policlinico Tor Vergata" Foundation, [4]Dept. of Clinical Sciences and Translational Medicine, "Tor Vergata" Univ. of Rome, Rome, Italy

Objective: To evaluate the effects of administering a cocktail of recombinant irisin (r-irisin), resveratrol and trolox in osteoblasts isolated from sedentary osteoporotic patients to (i) counteract the cellular senescence that characterizes age-related musculoskeletal diseases such as osteoporosis, and (ii) identify a potential strategy that can mimic the effects of a healthy lifestyle based on regular exercise and adequate diet.
Methods: Primary cultures of human osteoblasts were set up from bone biopsies taken from 10 patients undergoing hip arthroplasty for fragility fracture. After treatment with the anti-senescence cocktail for 6 days, quantitative assays were performed to assess cell viability and the presence of intracellular reactive oxygen species (ROS). B-galactosidase activity was assessed by quantitative and colorimetric assay, while immunocytochemistry and western blot analyses were performed to detect the Sirt1 and NOX4 expressions.
Results: The treatment significantly reduced the amount of intracellular ROS and β-galactosidase activity, while cell viability was significantly improved. Interestingly, a modulation of SIRT1 expression was observed in association with reduced NOX4 expression.
Conclusion: The administration of r-irisin, trolox and resveratrol exerts powerful beneficial effects on osteoblasts, suggesting that strategies that mimic the effects of a healthy, balanced lifestyle can counteract cellular senescence in osteoporosis.

P583
ASSESSMENT OF GAIT STEREOTYPE FUNCTION IN PATIENTS WITH TRAUMATIC AND COMPRESSION-ISCHEMIC NEUROPATHIES

I. Chapko[1], A. Filipovich[1], J. Ovsjanik[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Objective: 36 patients with traumatic and compression-ischemic neuropathies using quantitative criteria were examined.
Methods: Assessment of stato-dynamic violations using codes ICF.
Results: The following data were obtained in the course of the study: b770.0. No impairment (0–4%). Patients complained of slight walking impairment (uneven surface, 131 accelerated steps). b770.1: Mild impairment (5–24%). Visual limping on the paretic leg is noted. Increase in the number of steps when walking 100 m to 150–160, increase in the duration of a double step to 1.5–1.7 s, decrease in the walking pace to 64–70 steps/min, decrease in the walking rhythm factor to 0.85–0.90, decrease in walking speed to 3.0 km/h. b770.3.1: Severe impairment (50–75%). Paretic gait. Increase in the number of steps when walking 100 m to 204–226, increase in double step duration to 2.6–3.6 s, decrease in walking pace to 29–46 steps/min, decrease in walking rhythm coefficient to 0.52–0.58. b770.3.2: Severe impairment (76–95%). Gait is grossly impaired with significantly delayed movement. b770.4: Absolute impairment (96–100%). Patient cannot move independently.
Conclusion: A clinical and functional analysis of the gait stereotype function was carried out in 36 patients with traumatic and compression-ischemic neuropathies using quantitative criteria for the purpose of medical examination and rehabilitation diagnostics.

P584
ASSESSMENT OF THE RISK OF DISABILITY FORMATION IN PATIENTS WITH TRAUMATIC AND COMPRESSION-ISCHEMIC NEUROPATHIES

I. Chapko[1], A. Filipovich[1], J. Ovsjanik[1]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Objective: A clinical and functional study of 42 patients was carried out.
Methods: Assessment of stato-dynamic violations using codes ICF.
Results: First of all, such factors as the presence and high functional class ($FC > 1$) of the severity of the main (deficit) neurological syndrome, low dynamics of restoration of impaired functions during treatment and rehabilitation had a high significance in the development of disability in the late recovery period; inability to perform professional work in their previous profession. In the course of the study, it was found that the significance of individual factors in different periods of the disease is unequal, if in the acute and recovery period of the disease the significance of medical factors is higher, then in the long-term period the role of social (professional) factors is higher. In a number of cases, patients had difficulties in implementing an individual rehabilitation program in terms of fulfilling labor recommendations, which was especially true for individuals. employed in labor with a high role of physical labor, forced position of the body, prescribed pace of work. The psychological characteristics of patients played a certain role in reducing the rehabilitation potential and prolonging disability. In cases of psychopathological disorders caused by situational influence (injury as a result of a traffic accident, occupational disease) with FC1 and above, as the pathological process stabilized due to damage to nerve structures, the pain process gradually became chronic, the role of psychopathological and psychovegetative disorders in the formation of disability increased. due to the presence of social compensation syndrome.
Conclusion: The factors determining the reduction of the rehabilitation potential and the formation of disability in patients with traumatic and compression ischemic neuropathies at different periods of the disease are established.

P585
IN VITRO CHARACTERIZATION OF SATELLITE CELLS ISOLATED FROM A HUMAN SKELETAL MUSCLE BIOPSY AND ROLE OF THE ENDOCANNABINOID SYSTEM

I. Falsetti[1], G. Palmini[2], S. Donati[1], C. Aurilia[1], L. Margheriti[3], G. Galli[1], R. Zonefrati[2], C. Romagnoli[1], G. Picchioni[3], T. Iantomasi[1], M. L. Brandi[2]

[1]Dept. of Experimental and Clinical Biomedical Sciences, Univ. of Florence[2]Fondazione Italiana Ricerca sulle Malattie dell'Osso (F.I.R.M.O Onlus), [3]Stabilimento Chimico Farmaceutico Militare (SCFM)_Agenzia Industrie Difesa (AID), Florence, Italy

Objective: Satellite cells are mitotically quiescent in healthy skeletal muscle but following damage they become activated and transform into myoblasts to regenerate muscle tissue. In recent years, studies

have shown that the endocannabinoid system (ES) is involved in numerous physiological muscle processes, such as muscle cell growth and muscle regeneration. Therefore, the aim of this work is to evaluate the presence and role of the ES in an in vitro model of human skeletal muscle satellite cells.

Methods: The human muscle biopsy sample was treated with 0.3 mg/ml collagenase to establish a primary satellite cell line, marked as SC-1. Initially, SC-1 was characterized by molecular and cellular biology analysis. On the established cell line, the expression levels of myogenic differentiation genes were assessed with TaqMan technology. In addition, the expression of the different ES components was assessed by qualitative PCR analysis.

Results: From the muscle biopsy, the primary satellite cell line was set up and the stem phenotype has been confirmed through the osteogenic and the adipogenic assays. Myogenic differentiation was confirmed by positively evaluating the expression of myogenic differentiation marker genes (*Desmin* and *Miosin Heavy Chain*), myogenic regulatory factors (*Myf5, MyoD, Myogenin* and *MRF4*), hormone receptors (*VDR, TRα, TRβ, GCR* and *IGF*) and *Irisin*. Then the gene expression analysis of ES components (*CB1, CB2, TRPV1, NAPE, FAAH,* and *DAGLα*) revealed not only their presence in the satellite cell line, but also that these genes are modulated during myogenic differentiation.

Conclusion: A primary satellite cell line was set up and characterized from a muscle tissue biopsy. In this study, for the first time, not only the presence of ES but also its modulation during the differentiation and maturation process of satellite cells was demonstrated. Since ES has been shown to be involved in muscle regeneration, these preliminary data can help identify new therapeutic targets in diseases where there is muscle tissue impairment.

Acknowledgments: Supported by Fondazione Ente Cassa di Risparmio di Firenze and by F.I.R.M.O Onlus.

P586
PATIENTS' USE OF REMOTE VISITS AMONG THE OLDEST-OLD ADULTS AT HIGH RISK OF FRAGILITY FRACTURES

I. G. M. Macchione[1], A. R. B. Bianco[1], S. Brogna[1,1], C. A. G. Cocomazzi[1], G. V. Gemo[1], M. F. Mancinetti[1], P. F. Perini[1], P. C. Properzi[1], T. M. Tagliaavento[1], X. D. Xenos[1], E. M. C. Ercolani[1], F. B. Fabbri[1], C. G. Casacci[1], F. M. Ferracci[1], B. V. Boccardi[1], P. M. Mecocci[1], B. M. Baroni[1], R. C. Ruggiero[1]

[1]Orthogeriatric Service, Geriatric Unit, Institute of Gerontology and Geriatrics, Dept. of Medicine, Univ. of Perugia, Perugia, Italy

Objective: Telemedicine is increasingly widespread to overcome monitoring barriers associated with monitoring of chronic diseases, including those at high risk for fragility fractures, albeit supported by little evidence so far. We investigated the feasibility and effectiveness of telemedicine in managing patients at high risk for fragility fractures during the lockdown period for COVID-19 and then we evaluated the satisfaction of telemedicine service among patients and caregivers and bone specialists.

Methods: From January 2021 to June 2021 we conducted a prospective observational study in older adults with ongoing drug treatments for secondary prevention of fragility fractures by using tele-health service. Patients with ongoing treatments with denosumab or teriparatide require 6 or 12 months assessment for safety and adherence and according with patients' schedule, a nurse made telephone calls with patients, after explanation of the opportunity to attend the virtual service, booked an agreement about day and time of the visits in a dedicated agenda. The televisits are performed by a dedicated platform ad generated a report with updated medical prescriptions and healthy lifestyle recommendations, that the patients downloaded to forward to their GPs.

Results: 407 subjects were contacted and 352 older patients accepted the virtual approach. The majority of patients (59.88%) are women, aged 81.4 ± 8.8 years old, 90.9% leaves in the same healthcare district of the outpatient clinic. All patients are community dwellings with high level of independence in basic daily activities (49.6% with more than 5 ADL independence and mean ADL 4.27 ± 1.6) and instrumental daily activities (37.8% with more than 6 for all sample and mean IADL equal to 4.21 ± 2.8). The majority of patients (343; 8%) experiences major fragility fractures and less than half of the sample also minor fragility fractures (42.5%; n 173). The most prevalent ongoing antifracture drugs include denosumab (79.6%) followed by teriparatide (12%) and about 80.6% of patients on antifracture drugs were also taking both calcium and vitamin D supplements and 50.6% plus vitamin D supplements alone. A satisfaction questionnaire about telemedicine has been proposed to patients and bone specialists.

Conclusion: The telemedicine service may be a great alternative at visit in presence.

P587
TIMING OF SURGERY FOR HIP FRAGILITY FRACTURES: DOES IT MATTER?

I. Genrinho[1], C. Machado[2], A. Humenyuk[3], S. P. Silva[4], S. F. Azevedo[2], C. Oliveira[4], A. Barcelos[4]

[1]Rheumatology Dept., Centro Hospitalar Tondela Viseu, Viseu, [2]Orthopaedic Dept., Centro Hospitalar Baixo Vouga, Aveiro, [3]Dept. of Mathematics, Univ. of Aveiro, Aveiro, [4]Rheumatology Dept., Centro Hospitalar Baixo Vouga, Aveiro, Portugal

Objective: To evaluate the impact of surgical timing on clinical outcomes, complications, and mortality rates associated with hip fragility fractures.

Methods: A retrospective study was conducted involving patients aged ≥ 50 years old with fragility hip fractures admitted to our Fracture Liaison Service between 2019-2023. Lifestyle behaviours, demographic data, comorbidities, preoperative wait times, hospital stay, postoperative complications, re-hospitalization at 1 and 3 months, and the need for re-operation, were assessed. The impact of surgical timing on one-year mortality was analysed. Data was analysed using RStudio.

Results: 359 hip fracture patients were screened, with a mean age of 81.0 y (± 9.2); the majority were women (85%). Patients were divided into two groups: Group 1 underwent surgical intervention within the first 48 h (63%), while Group 2 experienced delayed surgical intervention (37%). The mean hospital stay was 6.8 d (± 4.1) for Group 1 and 11.2 (± 5.9) for Group 2. 49% of the patients had an ASA score of III, followed by II (26%), I (21%), and IV (4.2%). Postoperative complications were observed in 31 patients with respiratory tract infections being the most reported (3.6%), followed by urinary (2.5%) and wound infections (2.5%). 25 patients required re-operation, while re-hospitalization was necessary for 7 and 3 patients at 1 and 3 months, respectively. The mortality rates were 3.4% and 5.3% at 6 and 12 months. Significant differences were noted between patients regarding hospital stay and ASA score ($p < 0.005$). However,

no differences were observed between the two groups concerning postoperative complications and mortality rates.

Conclusion: While early surgical intervention within the first 48 h is commonly advocated, delayed surgery remains a significant approach for many patients. No differences in postoperative complications and mortality rates between the early and delayed intervention groups were found. These findings highlight the need for further exploration into the factors influencing clinical outcomes beyond the temporal aspect of surgical timing.

P588
GLUCOSAMINE AND/OR CHONDROITIN VERSUS STRUCTURAL MODULATION OF GUT MICROBIOTA: FRIEND OR FOE?

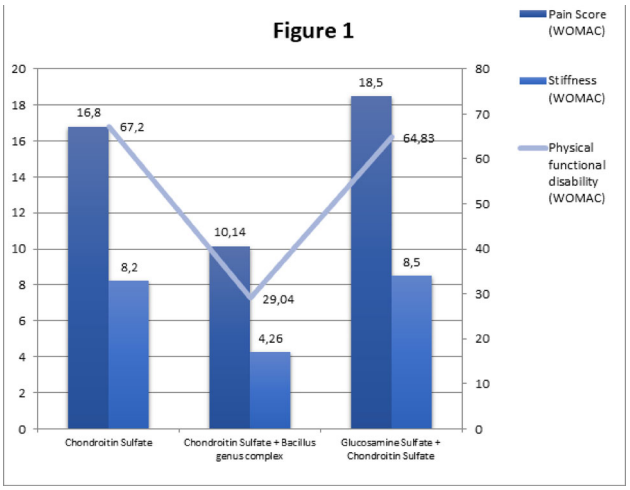
D. Rekalov[1], I. Golovach[2], T. Mefford[3], T. Tarasenko[1], I. Bryner[1], I. Daniuk[4], S. Dotsenko[4]

[1]Professor Rekalov Clinic of Rheumatology, Dnipro, [2]Feofaniya Clinical Hospital, Kyiv, Ukraine, [3]Medical Center "Consilium Medical", Kyiv, [4]Zaporizhzhia State Medical and Pharmaceutical Univ., Zaporizhzhia, Ukraine

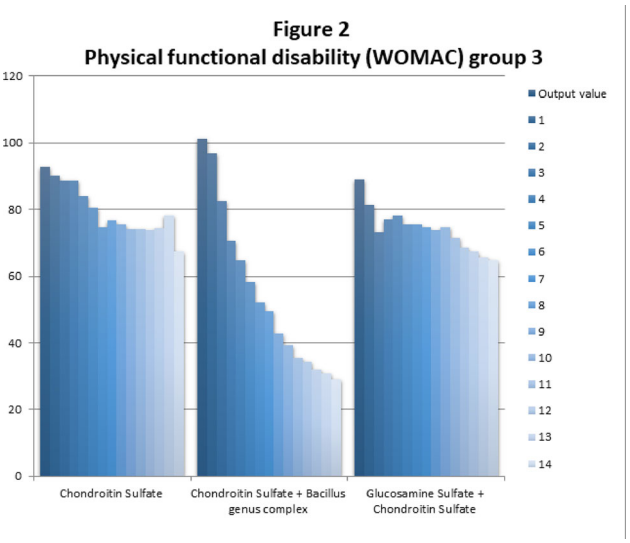
Objective: Despite multiple clinical trials of the use of glucosamine (GS) and chondroitin sulfate (CS) in osteoarthritis (OA), controversy regarding the efficacy of these drugs. Among the most debatable issues is combining GS with CS because of probable interference with GS absorption. According to the collected data, inflammation in OA is characterized as an innate immune response. Gut microbiota (GM) is a collection of microbial populations, responsible for immunological functions. Targeting the (GM) may represent a new therapeutic strategy for chronic pain management of OA. The aim of the study was to assess the efficacy and safety of combination therapy of Bacillus genus composition (BGC) with CS compared to GS and/or CS treatment in patients with OA.

Methods: Our study was performed in 30 patients with Kellgren–Lawrence radiographic grade I–II knee OA and moderate-to-severe pain (mean ± SD global pain score 64.2 ± 12.1 mm on a 100-mm visual analog scale [VAS]). Patients were randomized to receive either CS in a monotherapy (Fish, group 1, n = 10) or combined therapy with BGC plus CS (Fish, group 2, n = 10) or treatment with CS (Bovine, 1500 mg) plus GS (1200 mg) (group 3, n = 10) for 28 d. The main outcomes included the mean change in the investigator's global assessment of disease activity, total WOMAC, pain, stiffness and function subscale scores on the WOMAC.

Results: Patients of the group 3 (BGC + CS), according to the WOMAC score, have shown a statistically significant reduction in pain intensity, stiffness improvement in physical function.



After 14 d, the intensity of pain was lower by 47.83% ($p < 0.05$), and on the 28th day of treatment by 63.59% ($p < 0.05$) smaller relative to the baseline. As well as joint stiffness. On the day 14 the reduction was 50.43% ($p < 0.05$), by the day 28—63.59% ($p < 0.05$). Improving of physical function on the day 14 was achieved—51.18% ($p < 0.05$) and 51.34% at the end of treatment ($p < 0.05$).

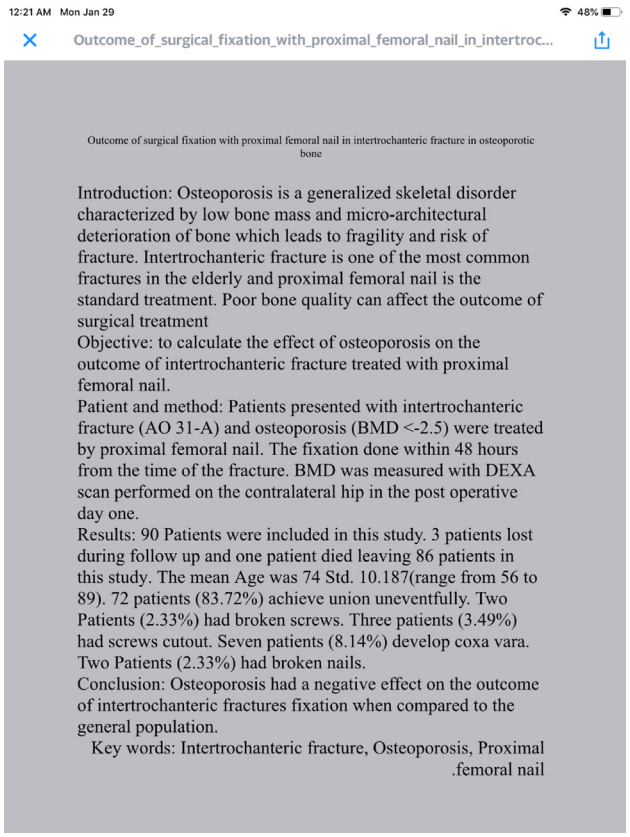


Conclusion: The results of our trial demonstrates a superiority of combination therapy of CS plus BGC over the traditional approaches including GS and/or CS treatment in terms of reducing joint pain, stiffness and functional impairment in patients with symptomatic knee OA for 28 d.

P589
OUTCOME OF SURGICAL FIXATION WITH PROXIMAL FEMORAL NAIL IN INTER TROCHANTERIC FRACTURES IN OSTEOPOROTIC BONE

I. H. Qasim[1]

[1]Alwasity Teaching Hospital, Baghdad, Iraq


12:21 AM Mon Jan 29 48%

Outcome_of_surgical_fixation_with_proximal_femoral_nail_in_intertroc...

Outcome of surgical fixation with proximal femoral nail in intertrochanteric fracture in osteoporotic bone

Introduction: Osteoporosis is a generalized skeletal disorder characterized by low bone mass and micro-architectural deterioration of bone which leads to fragility and risk of fracture. Intertrochanteric fracture is one of the most common fractures in the elderly and proximal femoral nail is the standard treatment. Poor bone quality can affect the outcome of surgical treatment

Objective: to calculate the effect of osteoporosis on the outcome of intertrochanteric fracture treated with proximal femoral nail.

Patient and method: Patients presented with intertrochanteric fracture (AO 31-A) and osteoporosis (BMD <-2.5) were treated by proximal femoral nail. The fixation done within 48 hours from the time of the fracture. BMD was measured with DEXA scan performed on the contralateral hip in the post operative day one.

Results: 90 Patients were included in this study. 3 patients lost during follow up and one patient died leaving 86 patients in this study. The mean Age was 74 Std. 10.187(range from 56 to 89). 72 patients (83.72%) achieve union uneventfully. Two Patients (2.33%) had broken screws. Three patients (3.49%) had screws cutout. Seven patients (8.14%) develop coxa vara. Two Patients (2.33%) had broken nails.

Conclusion: Osteoporosis had a negative effect on the outcome of intertrochanteric fractures fixation when compared to the general population.

Key words: Intertrochanteric fracture, Osteoporosis, Proximal femoral nail.

P590
ANTEROLATERAL BIKINI TOTAL HIP REPLACEMENT

I. H. Qasim[1]

[1]Alwasity Teaching Hospital, Baghdad, Iraq


Short term outcome of anterolateral bikini total hip arthroplasty

Introduction: Bikini incision was first propose for direct anterior approach hip arthroplasty as it follow anatomic skin creases and result in a more acceptable scar. Direct anterior hip approach has risk of lateral femoral cutaneous nerve injury. In this study the bikini incision was used in the anterolateral approach instead of the classical Watson-Jones incision.

Objectives: Outcome assessment regarding intraoperative trochanteric fracture and stem perforation, and post operative dislocation and lateral femoral cutaneous nerve injury in anterolateral bikini skin incision.

Methods: This is a prospective study of 394 Patients had undergone primary total hip arthroplasty via anterolateral bikini approach. All performed by single primary surgeon. Intraoperative trochanteric fracture, stem perforation and lateral femoral cutaneous nerve injury were assessed. Patients were followed for minimum of six months for dislocation.

Results: Statistical analysis showed that 1% of patients had trochanteric avulsion during reaming manipulation. 0.8% had stem perforation. Non develop hip dislocation or cutaneous nerve injury.

Conclusion: Anterolateral bikini total hip arthroplasty provide safe alternative to traditional incision with stable hip replacement with minimal or no risk of dislocation, stem perforation, trochanteric avulsion or lateral femoral cutaneous nerve injury.

Keyword: Anterolateral hip approach, hip arthroplasty, bikini incision.

Conflict of interests: The authors declare that there is no competing interests and nothing to disclose.

P591
MUSCULOSKELETAL DISORDERS IN MOTHERS OF CHILDREN WITH CEREBRAL PALSY

I. Haddada[1], S. El Arem[1], A. Haj Salah[1], A. Ameur[1], M. H. Zaafrane[2], T. Sayhi[2], A. Fekih[3], M. Sghir[1], W. Kessomtini[1]

[1]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, [2]Dept. of Family Medicine, Univ. of Monastir, Monastir, [3]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, Tunisia

Objective: Children with cerebral palsy (CP) need assistance for their self activities which expose the caregivers to different risk factors of musculoskeletal disorders (MSDs). The aim of the present study was to identify prevalence of MSDs among mothers of children with CP and to determine the associated factors.

Methods: Mothers of children with established diagnosis of CP were recruited at the period from July to December 2021. MSDs were evaluated by the standardized Nordic Musculoskeletal Questionnaire (NMQ). The functional statuses of the children were graded according to the Gross Motor Function Classification System (GMFCS) scale.

Results: The study included 71 mothers, with mean age 38.77 $\pm$ 7.27 y [23-55 y]. The mean age of the children with CP was 7.7 $\pm$ 2.75 y [2–12 y]. The most common clinical subtype of CP was spastic quadriplegia (47.9%). 38 children had the lowest level of functional status GMFCS (IV 18.3% and V 35.2%). 7 children (9.9%) had high grade BMI. A total of 61 mothers (85.9%) reported having experienced an MSD for a minimum of six weeks at the evaluation. Basing

on the NMQ questionnaire, the common MSD identified were low back pain (77.5%), neck pain (29.6%) and shoulder pain (30.9%). Pain was mild to moderate in 83.1% of cases with a mean visual analogue scale (VAS) 4.21 ± 2.23 mm [1-8]. The average duration of pain was 3.26 ± 2.78 y [1-9 y]. In our study, Significant association was observed between musculoskeletal pain and functional level of the child (GMFCS) ($p = 0.023$). The variables clinical subtype of CP, BMI and age of the child had no significant association with musculoskeletal pain among mothers.

Conclusion: It can be concluded that the primary caregivers for children with CP have shown a significant prevalence of MSDs. Thus, clinicians who treat children with physical disability should screen the caregivers for musculoskeletal discomfort.

P592
CHRONIC LOW BACK PAIN: PAIN INTENSITY, DISABILITY AND QUALITY OF LIFE AMONG CAREGIVERS OF STROKE PATIENTS

I. Haddada[1], A. Ameur[1], S. El Arem[1], A. Haj Salah[1], A. Fekih[2], M. Sghir[1], W. Kessomtini[1]

[1]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, [2]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, Tunisia

Objective: Owing to limitations in daily movements, stroke patients need assistance for their self activities which expose the caregivers to different risk factors of musculoskeletal disorders such as chronic low back pain (CLBP). Moreover, musculoskeletal discomfort might worsen caregivers' depressive symptoms and quality of life (QOL). The aims of the study were to assess perceived pain and disability among stroke caregivers and to determine the impact of CLBP on QOL.

Methods: Caregivers of stroke patients were recruited during the period from December 2021 to November 2022. Back pain intensity was assessed by the visual analog scale (VAS). We used the Oswestry low back pain disability questionnaire and the Dallas Pain Questionnaire to assess LBP-related functional disability. For each caregiver, the QOL was evaluated according to the Short Form Health Survey (SF-36).

Results: The study included 59 wife-caregivers, with a mean age of 55 ± 9 y [34–82 y]. The mean age of impairment patients was 60.64 ± 10 y [40–85 y]. In our study, 68.3% of wife-caregivers reported CLBP. The mean VAS for pain was 6.45 ± 1.23 mm [3–9]. Pain was severe (VAS > 7) in 54.2% of cases. The average duration of CLBP was 3.5 ± 5.78 y [2-10]. The average score of Oswestry was 33.42% ± 19.83 [22–78]. Nineteen caregivers (32.2%) were severely disabled (Oswestry score > 41%). Concerning the mean Dallas score, the segmental results were as follows: 63.1% of impact on daily activities, 35.7% of impact on work/leisure ratio, 45.2% of impact on anxiety/depression ratio and 38.5% of impact on sociability. Concerning the QOL: the mean SF-36 scale was 41.18 ± 20.88 and a poor QOL (SF-36 < 66.7) was noted in 83.05% of cases. A significant association was observed between functional limitation (Oswestry) ($p = 0.043$), pain intensity ($p = 0.002$) and pain duration ($p < 0.001$) with poor QOL among caregivers.

Conclusion: CLBP was present to a higher degree in caregivers and had a negative impact on their QOL.

P593
CHRONIC LOW BACK PAIN IN MOTHERS OF CHILDREN WITH CEREBRAL PALSY

I. Haddada[1], S. El Arem[1], A. Haj Salah[1], A. Ameur[1], M. H. Zaafrane[2], T. Sayhi[2], A. Fekih[3], M. Sghir[1], W. Kessomtini[1]

[1]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, [2]Dept. of Family Medicine, Univ. of Monastir, Monastir, [3]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, Tunisia

Objective: Cerebral palsy (CP) is the most common cause of physical disability in childhood. Owing to limitations in daily movements, disabled children need assistance for their self activities which expose the caregivers to different risk factors of musculoskeletal disorders. The aims of the study were to investigate how low back pain (LBP) affects functional limitations in mothers of children with CP and to determine the associated factors.

Methods: Mothers of children with established diagnosis of CP were recruited at the period from July to December 2021. The functional statuses of disabled children were graded according to the Gross Motor Function Classification System (GMFCS) scale. Back pain intensity was assessed by the visual analog scale (VAS). We used the Oswestry low back pain disability questionnaire and the Dallas Pain Questionnaire to assess LBP-related functional disability.

Results: The study included 71 mothers, with mean age 38.77 ± 7.27 y [23–55 y]. The mean age of the children with CP was 7.7 ± 2.75 y [2–12]. 38 children had the lowest level of functional status GMFCS (IV 18.3% and V 35.2%). 7 children (9.9%) had high grade BMI. In our study, 77.5% of mothers reported LBP. The mean VAS for pain was 4.21 ± 2.23 mm [1–8]. Pain was mild to moderate in 83.1% of cases. The average duration of LBP was 3.26 ± 2.78 y [1–9]. The average score of Oswestry was 33.42% ± 19.83 [22–78]. 19 mothers (26.8%) were severely disabled (Oswestry score > 41%). Concerning the mean Dallas score, the segmental results were as follows: 53.1% of impact on daily activities, 30.7% of impact on work/leisure ratio, 55.2% of impact on anxiety/depression ratio and 40.5% of impact on sociability. In our study, Significant association was observed between functional limitations in mothers (Oswestry) and pain intensity ($p = 0.023$), age of the mother ($p = 0.001$), functional level of the child (GMFCS) ($p = 0.043$) and overweight in children ($p = 0.043$).

Conclusion: A significant prevalence of low back pain and discomfort in caregivers of children with CP.

P594
FREQUENCY OF MUSCULOSKELETAL DISORDERS IN CAREGIVERS OF STROKE PATIENTS

I. Haddada[1], A. Ameur[1], S. El Arem[1], A. Haj Salah[1], A. Fekih[2], M. Sghir[1], W. Kessomtini[1]

[1]Physical Medicine and Rehabilitation Dept. Taher Sfar Univ. Hospital, Mahdia, [2]Orthopaedic Dept. Fattouma Bourguiba Univ. Hospital, Monastir, Tunisia

Objective: Taking care of a patient with a motor disability can significantly impact both the physical and psychological statuses of caregivers. Musculoskeletal disorders (MSDs) such as pain in the back, shoulder, knee, etc. are common in full-time caregivers. However, the prevalence of MSDs in caregivers remains unknown. The aim of the present study was to identify prevalence of MSDs among family caregivers of stroke patients and to determine the associated factors.

Methods: Caregivers of stroke patients were recruited during the period from December 2021 to November 2022. The functional

statuses of patients with disability were determined using the Functional Independence Measure (FIM). MSDs were evaluated by the standardized Nordic Musculoskeletal Questionnaire (NMQ). Pain was evaluated according to the visual analog scale (VAS).
Results: The study included 59 wife-caregivers, with a mean age of 55 ± 9 y [34–82 y]. The mean age of impairment patients was 60.64 ± 10 y [40–85 y]. Nineteen motor-impaired patients (13.76%) had high-grade BMI. The average score of FIM was 99.3 [8–126]. The mean duration of a caregiver's role was 5.58 y [1–35 y]. The average number of weekly hours spent in caregiving was 35 h/week. A total of 49 (83%) wife-caregivers reported having experienced an MSD for a minimum of 6 weeks at the evaluation. Based on the NMQ questionnaire, the common MSD identified were low back pain (54.34%), neck pain (19.56%), and shoulder pain (27.53%). The pain was severe (VAS > 7) in 39.4% of cases with a mean VAS of 4.33 ± [1–10]. The average duration of pain was 4.23 ± 4 y [1-8 y]. A significant association was observed between pain and age of impaired patients ($p < 0.001$), obesity ($p = 0.002$), the number of weekly hours spent in caregiving ($p < 0.001$) and the duration of the caregiver's role ($p = 0.001$). However, no significant association was found between musculoskeletal pain and functional status (FIM) ($p = 0.073$).
Conclusion: The results indicated a significant prevalence of pain and musculoskeletal discomfort in caregivers of stroke patients; we recommend routine training in safe transferring, lifting and carrying techniques to all parents and caregivers.

P595
SYSTEMATIC EVALUATION OF ABDOMINAL AORTIC CALCIFICATION IN PATIENTS WITH A RECENT CLINICAL FRACTURE VISITING THE FRACTURE LIAISON SERVICE

I. J. A. De Bruin[1], C. E. Wyers[1], L. Vranken[1], J. T. Schousboe[2], R. Y. van der Velde[1], H. M. J. Janzing[3], F. O. Lambers Heerspink[4], P. P. M. Geusens[5], J. P. W. van den Bergh[1]

[1]Dept. of Internal Medicine, VieCuri Medical Centre, Venlo, Netherlands, [2]Park Nicollet Clinic and HealthPartners Institute, HealthPartners Inc., Minneapolis, USA, [3]Dept. of Surgery, VieCuri Medical Centre, Venlo, Netherlands, [4]Dept. of Orthopaedic Surgery, VieCuri Medical Centre, Venlo, Netherlands, [5]Dept. of Internal Medicine, Subdivision Rheumatology, CAPHRI, Maastricht Univ. Medical Centre + (MUMC+), Maastricht, Netherlands

Objective: Abdominal aortic calcification (AAC) is associated with an increased risk of cardiovascular disease (CVD), osteoporosis and fractures. We analyzed the prevalence and severity of AAC in patients with a recent clinical fracture who attended the Fracture Liaison Service (FLS).
Methods: Cross-sectional cohort study of patients with a recent clinical fracture (aged 50–90 y) attending the FLS. Patients received an evaluation of risk factors for fracture, verified medical history, BMD measurements, and lateral spine imaging using DXA. AAC prevalence was assessed using the AAC-24 score and categorized as none, moderate (AAC-24 1-4) and severe (AAC-24 ≥ 5). Multivariate logistic regression analyses were performed to study the association between risk factors for AAC and the presence and severity of AAC.
Results: AAC was present in 478 (27.6%) of 1731 patients of which 207 (43.3%) had moderate and 271 (56.7%) severe AAC. Most patients with AAC (318, 66.5%) did not have a medical history of CVD. The presence of AAC was associated with age (OR: 1.09, 95% CI 1.07–1.11), BMI (OR: 0.94, 95% CI 0.91–0.97), smoking (OR: 2.00, 95% CI 1.50–2.66), history of CVD (OR: 1.96, 95% CI 1.46–2.63), and prevalent grade 2/3 vertebral fractures (VFs) (OR: 1.37, 95% CI 1.01–1.88). The presence of severe AAC was associated with age (OR: 1.11, 95% CI 1.09–1.13), BMI (OR: 0.93, 95% CI 0.90–0.97), and history of CVD (OR: 2.31, 95% CI 1.63–3.27). In the subgroup without myocardial infarction or cardiovascular accidents, AAC was associated with age, BMI, and smoking.
Conclusion: The prevalence of AAC was 27.6% in patients with a recent clinical fracture, who attended the FLS. Besides association with classical risk factors (age, CVD history) and BMI, the presence or severity of AAC was not associated with BMD (categorical). The presence of AAC, but not the severity of AAC, was associated with a prevalent grade 2 or 3 VF and smoking.

P596
SKELETOMUSCULAR ROBUSTNESS AND BONE STRUCTURAL PARAMETERS IN ELITE YOUTH ATHLETES

I. Kalabiska[1], A. Zsákai[2], D. Annár[1], Z. Borbás[1], N. Bondarchuk[3], H. P. Bhattoa[4]

[1]Hungarian Univ. of Sport Science, Research Center for Sport Physiology, Budapest, Hungary, [2]Eotvos Lorand Univ., Dept. of Biological Anthropology, Budapest, Hungary, [3]Uzhhorod National Univ., Dept. of Physical Education, Uzhhorod, Ukraine, [4]Univ. of Debrecen, Dept. of Laboratory Medicine, Debrecen, Hungary

Objective: In DXA analytical practice, it is important to use athlete references to estimate bone development in athlete children and adolescents. In 2020, our research team introduced new bone mineral reference values about young athletes. Our aim of the study was to construct BMD and bone mineral content (BMC) references of athletes by the type of sports.
Methods: DXA was used in 1793 elite athletes aged between 11-20 y. The bone structural parameters of each athlete were converted to z-scores relative to age- and sex-specific reference values specified by the DXA software. Z-profile analysis and principal component analysis were used to identify body structural components in young athletes and to evaluate the associations between the identified component and the type of sport.
Results: The total BMD of male athletes is considerably higher than the age-specific references for males ($p < 0.001$ in each age-group). An outstanding skeleto-muscular robusticity of male wrestlers, pentathletes and cyclers could be observed in the studied sports: wrestlers had significantly more developed skeletomuscular robusticity and BMD than the age-group average among elite athletes, while pentathletes and cyclers had worse bone structural parameters than the reference level for their age-group among elite athletes. The corresponding trends in the BMC of female athletes are significantly higher than the references ($p < 0.001$ in every age-group, with the exception of 13 y, $p = 0.04$). In case of female athletes, the rhythmic gymnasts' and pentathletes' bone structural parameters differed significantly from the players' average parameters of the studied elite athletes: their average skeletal robusticity both in the trunk and the extremities lagged behind the age-group mean values for elite athletes.
Conclusion: Compared to reference values for the general population, BMD and BMC of the youth athletes were better developed. The skeletal development of cyclers, pentathletes and rhythmic gymnasts should be monitored more frequently, since their bone development lags behind not only their age-peer elite athletes' bone development but also the population-based reference values.

P597
METABOLISM OF VITAMIN D DURING NORMAL PREGNANCY

I. Katsobashvili[1], E. Pigarova[1], L. Dzeranova[1], S. Vorotnikova[1], E. Bibik[1], M. Evloeva[1]

[1]Endocrinology Research Centre, Moscow, Russia

Objective: To study of vitamin D metabolism peculiarities in normal pregnancy in comparison with a control group of healthy female patients.
Methods: Two groups of patients participated in the study: group 1-pregnant patients (n = 20) from 18–45 y of age with gestational age from week 9 to 13; group 2—healthy female patients (n = 19) who underwent blood sampling for vitamin D metabolites to determine total 25(OH)D by immunochemiluminescence assay and 25(OH)D3, 3-epi-25(OH)D3, 24,25(OH)2D3, 1,25(OH)2D3 by high-performance liquid chromatography with mass spectrometric detection (HPLC-MS/MS).
Results: In group 1, the following results were obtained: total 25(OH)D, 26.1 ng/mL [17.4; 37.3], 25(OH)D3, 25.6 ng/ml [17.4; 37.3], 3-epi-25(OH)D3, 1.8 ng/mL [1.1; 3.2], 1,25(OH)D3, 33.4 pg/mL [16.1; 46.0], 24,25(OH)D3, 0.8 ng/mL [0.4; 1.5]. In group 2: total 25(OH)D—16.7 ng/mL [13.5; 27.2], 25(OH)D3—19.5 ng/mL [14.0; 27.0], 3-epi-25(OH)D3—1.1 ng/mL [0.75; 1.47], 1,25(OH)D3—38.8 pg/mL [34.0; 46.4], 24,25(OH)D3—1.5 ng/mL [0.82; 2.69]. For the above parameters, statistically significantly higher levels in the pregnancy group were obtained for total 25(OH)D ($p = 0.02$) and 3-epi-25(OH)D3 ($p = 0.002$). The ratio of 1,25(OH)D3/25(OH)D3 metabolites, reflecting 1-α-hydroxylase activity, was 0.00132 ng/mL [0.00067; 0.00206] vs. 0.0021 ng/mL [0.00153; 0.00264] ($p = 0.02$); the 25(OH)D3/24,25(OH)D3 ratio reflecting 24-hydroxylase activity was 24.1 ng/mL [18.6; 60.7] vs. 11.6 ng/mL [10.9; 17.6], $p = 0.003$, and the 3-epi-25(OH)D3/25(OH)D3 ratio reflecting 3-epimerase activity, 0.08 ng/mL [0.07; 0.10] vs. 0.05 ng/mL [0.05; 0.6], $p = 0.0004$, for group 1 and group 2, respectively.
Conclusion: The data obtained indicate that in the first trimester of pregnancy the epimerization of vitamin D increases, which raises the levels of this metabolite in the blood. A decrease in activation and increase in deactivation of vitamin D in pregnant women was also observed, which reflects the ratios of metabolites that characterize these processes.

P598
TRANSVERSE MYELITIS AND COVID-19 DISEASE LEADING TO SARCOPENIA

I. Kostoglou-Athanassiou[1], L. Athanassiou[2], A. Pastroudis[3], D. Begkas[3], P. Athanassiou[4], Y. Shoenfeld.[5]

[1]Dept. of Endocrinology, Diabetes and Metabolism, Asclepeion Hospital, Voula, Athens, Greece, [2]Dept. of Rheumatology, Asclepeion Hospital, Voula, Athens, Greece, [3]6th Dept. of Orthopedics, Asclepeion Hospital, Voula, Athens, Greece, [4]Dept. of Rheumatology, St. Paul's Hospital, Thessaloniki, Greece, [5]Zabludowicz Center for Autoimmune Diseases, Sheba Medical Center, Reichman Univ., Herzelia, Israel

The SARS-CoV-2 virus has caused the recent pandemic. In some patients the SARS-CoV-2 infection was characterized by neurological manifestations. One of these is transverse myelitis thought to be caused either by the virus itself as the SARS-CoV-2 virus may be neuroinvasive or by an autoimmune reaction due to molecular mimicry between the viral and host proteins. Transverse myelitis may lead to sarcopenia. The aim was to describe the case of a male patient with Hashimoto's thyroiditis who developed transverse myelitis leading to sarcopenia in the course of COVID-19 illness.
Casereport: The case of a 52 year-old male patient is described who developed transverse myelitis after COVID-19 infection. The patient presented with Hashitoxicosis approximately 15 y ago at the age of 37 y. TSH was 0.01 μIU/ml, anti-Tg and anti-TPO antibodies were positive, while a thyroid ultrasonogram revealed loss of homogeneity of the thyroid parenchyma. Unimazole was administered. During the course of the disease the patient developed hypothyroidism and thyroxine was administered. Approximately a year ago he presented with COVID-19 disease and a rather severe illness. The patient was admitted to a COVID-19 department. During hospitalization he started to feel numbness in the lower extremities and subsequently the lower extremities were paralyzed. Transverse myelitis was diagnosed and prednisolone was administered. Over the course of two months prednisolone was tapered and the patient improved. During the course of a year the patient improved substantially and is now in a program of rehabilitation. The patient developed sarcopenia in the course of time.
Conclusion: Transverse myelitis in the course of COVID-19 disease has been described. The disease may be due to the virus itself, as it may be neuroinvasive or to an autoimmune reaction due to molecular mimicry, i.e. due to the homology of amino acid sequences of the viral proteins to human amino acid sequences. Transverse myelitis may cause sarcopenia.

P599
MANAGEMENT OF OSTEOPOROSIS IN BREAST CANCER PATIENTS

I. Kostoglou-Athanassiou[1], L. Athanassiou[2], G. Georgiadis[3], A. Pastroudis[4], E. Manta[4], P. Athanassiou[5]

[1]Dept. of Endocrinology, Diabetes and Metabolism, Asclepeion Hospital, Voula, Athens, [2]Dept. of Rheumatology, Asclepeion Hospital, Voula, Athens, [3]4th Dept. of Orthopedics, Asclepeion Hospital, Voula, Athens, [4]6th Dept. of Orthopedics, Asclepeion Hospital, Voula, Athens, [5]Dept. of Rheumatology, St. Paul's Hospital, Thessaloniki, Greece

Breast cancer patients after surgery may get treatment with aromatase inhibitors. Aromatase inhibitors may induce osteoporosis and diffuse skeletal pain. Patients with breast cancer, who are treated with aromatase inhibitors should be followed up for the development of osteoporosis and should get specific treatment for the prevention and treatment of osteoporosis. The aim was to present a cohort of patients with breast cancer who were administered aromatase inhibitors and were treated with bisphosphonates.

A group of 10 female patients, aged 45–62 y, presented with breast cancer. Following surgery they were offered treatment with aromatase inhibitors. During follow-up BMD was measured.

Within the group of the patients with breast cancer, 6 were found to have osteopenia, T-score range − 1.6 to − 2.3 and 4 were found to have osteoporosis, T-score range − 2.5 to − 3.0. All patients were administered supplementation with calcium and vitamin D. Patients with osteoporosis were given alendronate in the effervescent form. BMD improved in the group with osteoporosis.

Breast cancer is a major health issue in the female population. Nowadays treatment with aromatase inhibitors significantly decreases endogenous estrogen levels and decreases the risk of recurrence or metastatic disease. However, aromatase inhibitors may induce osteoporosis. Bisphosphonates, in particular alendronate improves bone mass and is known to significantly decrease the risk of metastatic disease and death in breast cancer patients. In conclusion, we suggest that treatment with bisphosphonates, in particular alendronate in the effervescent form, may be a useful addition in the treatment of

patients with breast cancer, as it improves bone mass, decreases fracture risk and may improve the prognosis of the neoplasm, as it decreases the risk of recurrence and death.

P600
PREGNANCY AND LACTATION-ASSOCIATED OSTEOPOROSIS: UNANSWERED ISSUES

I. Lomtadze[1], T. Khutsishvili[2], N. Dvalishvili[3], N. Tonia[4], N. Eloshvili[5], M. Baratashvili[6]

[1]Aversi Clinic, [2]Todua Clinic, [3]Vakhtang Bochorishvili Clinic, [4]MediClubGeorgia, [5]New Hospitals, [6]Healthycore, Tbilisi, Georgia

Objective: Illustration of clinical features and treatment effectiveness of pregnancy and lactation-associated osteoporosis (PLO).
Methods: Laboratory tests, radiological scan and follow-up outcomes were analyzed.
Results: We report the 27-year-old woman, who presented to our hospital 3 months after her delivery. She complained about severe low back pain, which had started from third trimester of her pregnancy. The patient underwent DXA densitometry scan, which showed Z-score − 4.1 (at AP Spine). Lumbar MRI revealed vertebral compressive fractures at Th6, Th8, Th9, L1, L2. The patient had no history of trauma. The causes of secondary osteoporosis have also been excluded. Accordingly, the patient was diagnosed with PLO. Laboratory examination revealed vitamin D deficiency at 8.0 ng/ml. Other serum tests were within the normal ranges (PTH, ionized Ca, RF, ALP, P, TSH). Her BMI was 22.4 kg/m^2. The patient was advised to cease breastfeeding. Although zoledronic acid has been prescribed, first year the patient took only calcium and vitamin D supplementation. After one year follow-up visit DXA densitometry showed BMD improvement by 11.9% at the lumbar spine, 0.6% at total femur, and decreasing in BMD at femoral neck by − 3.3%. Patient took zoledronate (5 mg/100 ml) infusion. One year after zoledronate infusion the gain in BMD at AP Spine was 6.8, 5.4% at total femur and 6.3% at femoral neck. Although MBD was remarkably improved, at the 12th month of zoledronate infusion the patient felt low back pain radiated to sacroiliac joint. The patient underwent MRI scan, where sacral lateral mass fracture was detected.
Conclusion: Our case showed annual gain in lumbar spine BMD by 11.9% on calcium and vitamin D treatment only (and breastfeeding cessation as well), and new fracture development after bisphosphonate infusion. Many issues remain unanswered in terms of PLO management, further research on this condition is required.

P601
EFFECT OF MUSCLE POWER AND FUNCTIONAL PERFORMANCE ON QUALITY OF LIFE IN KNEE OSTEOARTHRITIS PATIENTS

I. M. Borda[1], L. Irsay[1], V. Ciortea[1], A. Ciubean[2], R. Ungur[1]

[1]Univ. of Medicine and Pharmacy Iuliu Hatieganu, Rehabilitation Dept., Rehabilitation Hospital, [2]Univ. of Medicine and Pharmacy Iuliu Hatieganu, Rehabilitation Dept., Cluj-Napoca, Romania

Objective: To evaluate muscle power and functional performance in knee osteoarthritis patients and to correlate them with quality of life.
Methods: 57 patients (62.5 ± 3.6 y, 29 men and 28 women) diagnosed with knee osteoarthritis according to ACR criteria were included in this cross-sectional study. Knee extensor power was measured by the isokinetical method at the angular velocity of 120°/s, using a Gymnex Iso 2 Dynamometer. Functional performance was assessed by the timed up-and-go (TUG) test, chair rising test (CRT) and 6-min walk (6 MW) test. Quality of life was assessed by SF-36 questionnaire (Romanian version). Analyses of the relationship between power and functional performance parameters and quality of life scores were done.
Results: TUG score negatively correlated with knee extensor power ($r = -0.276$, $p < 0.05$) and SF-36 score ($r = -0.592$, $p < 0.05$). Positive correlation was found between the CRT and the knee extensor power ($r = 0.422$, $p < 0.05$), as well as between the CRT and SF-36 score ($r = 0.511$, $p < 0.05$). 6 MW test positively correlated with the knee extensor power ($r = 0.395$, $p < 0.05$) and the SF-36 score ($r = 0.578$, $p < 0.05$). SF-36 score positively correlated with knee extensor power ($r = 0.396$, $p < 0.05$).
Conclusion: Muscle power and functional performance significantly influenced the quality of life in the knee osteoarthritis patients. Therefore, they should be included in rehabilitation programs focused on muscle training and functional improvement, leading to a consequently better quality of life.

P602
RELEVANCE OF SEGMENTAL BODY COMPOSITION IN FRAGILITY FRACTURE PATIENTS AMONG COMMUNITY DWELLING ELDERLY

I. M. Imaoka[1], T. F. Tazaki[1], H. M. Hida[1], I. W. Ichinose[1], T. S. Takamatsu[1], S. K. Sakai[1], N. M. Nakamura[1]

[1]Osaka Kawasaki Rehabilitation Univ., Osaka, Japan

Objective: This study investigated the characteristics of individuals with reduced BMD and a history of fractures after the age of 60 y. This study considered previously reported associations, segmental anthropometric measurements, and information communication technology tool use.
Methods: The study included 242 community-dwelling elderly individuals (mean age 74.4 ± 6.6 years) in Japan. Participants were excluded if they were unable to undergo motor function assessment or had pacemakers that prevented body composition analysis. The study collected data on various parameters, including BMD, walking speed, grip strength, two-step time, skeletal muscle mass index (SMI), segmental muscle mass and fat mass, number of medications, number of online tools used, Geriatric Depression Scale score, Addenbrooke's Cognitive Examination score, Trail Making Test parts A and B, and other basic attributes. For the statistical analysis, participants with BMD below 90% and a history of fracture after the age of 60 y were divided into two groups: the fragility fracture group and the non-fragility fracture group. Univariate analysis was conducted between the two groups to identify factors characteristic of the fragility fracture group.
Results: The fragility fracture group comprised 22 patients (9.1%), while the non-fragility fracture group comprised 220 patients (90.9%). A comparison between the two groups revealed significant differences in several parameters, excluding bone density. SMI was lower in the fragility fracture group (5.5 ± 0.8 kg/m^2) compared to the non-fragility fracture group (6.0 ± 1.0 kg/m^2). Similarly, right lower limb muscle mass was lower in the fragility fracture group (5.0 ± 0.1 kg/m^2) compared to the non-fragility fracture group (5.7 ± 1.4 kg/m^2). Left lower limb muscle mass also significantly differed between the groups, with 5.0 ± 1.1 kg/m^2 in the fragility fracture group, and 5.7 ± 1.1 kg/m^2 in the non-fragility fracture group. No other study parameters showed significant differences between the two groups.
Conclusion: Patients with fragility fractures demonstrate significantly lower SMI and lower limb muscle mass compared to those without fragility fractures. These findings suggest that quantitative assessment of segmental muscle mass, fall risk assessment, and BMD enhancement may be crucial for improving the effectiveness of secondary fracture prevention strategies.

P603
INFLUENCE OF LUMBAR SYNDROME ON THE ABILITY TO PERFORM ACTIVITIES OF DAILY LIFE

A. Kosic[1], J. Zvekic-Svorcan[2], K. Boskovic[2], I. Minakovic[3], T. Jankovic[2], R. Krasnik[4]

[1]Univ. of Novi Sad, Faculty of Medicine Novi Sad, [2]Univ. of Novi Sad, Faculty of Medicine Novi Sad. Special Hospital for Rheumatic Diseases, [3]Univ. of Novi Sad, Faculty of Medicine Novi Sad. Health Center "Novi Sad", [4]Univ. of Novi Sad, Faculty of Medicine Novi Sad. Institute of Child and Youth Health Care of Vojvodina, Novi Sad, Serbia

Objective: To examine the limitations in various activities of daily life in patients with lumbar syndrome.
Methods: With the approval of the Ethics Committee (14/32-1/1-22) of the Special Hospital for Rheumatic Diseases in Novi Sad, Serbia, a prospective cross-sectional study involving 100 subjects of both sexes, aged 40–65 y, diagnosed with lumbar syndrome was conducted. All patients signed an informed consent prior to administering a general questionnaire constructed by the examiner and the Oswestry disability index (ODI) assessing the impact of back pain on their ability to manage everyday life. Statistical processing and analysis were performed in SPSS ver.24.
Results: Majority (68%) of respondents were women, 63% of the participants were obese and 70% were married, while 58% completed secondary vocational education. In 66% of the cases, pain in the lumbar spine occurred when resting and working, and 69% of respondents experienced it ≥ 3 times per year, leading to work absences in 21% of the cases. While the mean ODI value for the sample was 28.13, a statistically significant difference in daily functioning was noted among respondents of different marital status ($F = 3.201$, $p < 0.05$). Divorced ($M = 40.90$) and married ($M = 26.17$) individuals reported the highest and the lowest degree of restriction, respectively. Those who live alone showed a higher degree of limitation ($M = 35.89$) than those living with family members ($M = 26.43$, $F = 6.225$, $p < 0.05$). The greatest limitation in daily functioning was noted in individuals experiencing back pain at rest and while working ($M = 32.20$), while being the lowest in subjects in whom back pain occurs only during work ($M = 19.78$, $F = 8.315$, $p < 0.001$). As expected, greater limitation in functioning was noted in subjects frequently absent from work ($M = 42.50$) compared to those with occasional absences ($M = 23.44$, $F = 4.795$, $p < 0.01$). A greater limitation in functioning was also associated with back pain frequency (≥ 3 times per year: $M = 30.91$ vs. < 3 times per year: $M = 22.60$, $F = 4.115$, $p < 0.05$).
Conclusion: The greatest degree of limitation in daily functioning is experienced by individuals who are divorced, live alone, in whom lower back pain occurs during rest and work, it emerges ≥ 3 times per year, and leads to frequent work absences.

P604
DETERMINANTS OF FREQUENT SICK LEAVE IN PATIENTS WITH CHRONIC LOW BACK PAIN

I. Minaković[1], J. Zvekić-Svorcan[2], D. Živanović[3], M. Vojnović[4], A. Miljković[5], K. Bošković[6]

[1]Faculty of Medicine, Univ. of Novi Sad, Novi Sad, Serbia; Health Center "Novi Sad", Novi Sad, [2]Faculty of Medicine, Univ. of Novi Sad, Novi Sad; Special Hospital for Rheumatic Diseases Novi Sad, Novi Sad, [3]Faculty of Medicine, Univ. of Novi Sad, Novi Sad; Dept. of Psychology, College of Social Work, Belgrade, [4]Faculty of Medicine, Univ. of Novi Sad, Novi Sad, [5]Faculty of Medicine, Univ. of Novi Sad, Health Center "Novi Sad", Novi Sad, [6]Faculty of Medicine, Univ. of Novi Sad,; Special Hospital for Rheumatic Diseases Novi Sad, Novi Sad, Serbia

Objective: An estimated 2–3% of the population in developed nations grapple with chronic back pain, which is defined as persisting for a duration of three months or longer. This condition places a considerable burden on society due to the substantial costs associated with its treatment, extended sick leaves, and reduced work productivity. The aim of this study was to identify the factors that increase the likelihood of more frequent sick leave in individuals suffering from chronic low back pain.
Methods: This retrospective cross-sectional study comprised 100 individuals of both genders aged between 40–65 y who reported lumbosacral spine pain of at least 5 on the Numerical Pain Rating Scale (NPRS). The study encompassed patients who received treatment at the Special Hospital for Rheumatic Diseases in Novi Sad from April 2022 to August 2022. Data concerning body weight, height, sociodemographic information, and the outcomes of the Pain Catastrophizing Scale (PCS) and NPRS questionnaires were extracted from the patients' medical records.
Results: Significant predictors of sick leave in patients suffering from lower back pain included a higher level of pain catastrophizing ($OR = 1.045$, $p = 0.016$), engagement in physically demanding occupations, and the presence of pain radiating down the leg ($OR = 4.524$, $p = 0.013$). Individuals who engage in extensive walking during their work duties ($OR = 5.400$, $p = 0.009$) and those involved in physically demanding tasks ($OR = 5.85$, $p = 0.011$) are five times more likely to experience work absenteeism compared to respondents whose work primarily involves sitting. Nevertheless, the sole factor predicting more frequent sick leave (≥ 3 times within a single year) was the occurrence of radiating leg pain ($OR = 7.111$, $p = 0.047$).
Conclusion: Prominent statistical indicators for sick leave among patients with lower back pain involve an elevated degree of pain catastrophizing and involvement in physically demanding professions. Furthermore, the occurrence of pain radiating to the lower extremities serves as a statistically significant predictor for both sick leave and its frequency.

P605
CORRELATION BETWEEN METABOLIC SYNDROME AND EXTENT OF STRUCTURAL AND FUNCTIONAL IMPAIRMENT IN KNEE OSTEOARTHRITIS

I. Minaković[1], J. Zvekić-Svorcan[2], L. J. Dražić[3], M. Smuđa[4], J. Javorac[5], T. Janković[6]

[1]Faculty of Medicine, Univ. of Novi Sad, Health Center "Novi Sad", Novi Sad, [2]Faculty of Medicine, Univ. of Novi Sad, Special Hospital for Rheumatic Diseases Novi Sad, Novi Sad, [3]Special Hospital for Rheumatic Diseases Novi Sad, Novi Sad, [4]Faculty of Medicine, Univ. of Novi Sad, Novi Sad, The Academy of Applied Studies Belgrade, Dept. of Higher Medical School, Belgrade, [5]Faculty of Medicine, Univ. of Novi Sad, Novi Sad, Institute for Pulmonary Diseases of Vojvodina, Sremska Kamenica, [6]Faculty of Medicine, Univ. of Novi Sad, Special Hospital for Rheumatic Diseases Novi Sad, Novi Sad, Serbia

Objective: Lately, numerous studies have investigated the link between metabolic syndrome (MetS) and osteoarthritis (OA). Nonetheless, the exact nature of the association between these two conditions remains controversial. The aim of this study was to investigate the connection between MetS and the extent of structural and functional knee impairment in postmenopausal women with knee OA.
Methods: This retrospective cross-sectional study comprised 90 female participants aged between 60–75 y. These individuals received

treatment for knee OA at the Special Hospital for Rheumatic Diseases Novi Sad, Serbia, from February 2022 to October 2022. Data were extracted from their medical records, including anthropometric measurements, blood pressure, biochemical blood findings, the presence of comorbid conditions, and standard knee radiographs. Participants were categorized into three groups according to the extent of knee damage determined through assessment using the Kellgren-Lawrence (KL) scale. Additionally, the study incorporated responses from the Lower Extremity Functional Scale (LEFS) questionnaire, previously completed by the participants.

Results: In the sample, 43.3% of the participants had grade KL2 knee damage (Group I), 34.4% had grade KL3 (Group II), and 22.2% were classified as grade KL4 (Group III). The mean age of the respondents was 67.25 (standard deviation = 4.21), and there were no statistically significant differences between the groups ($p = 0.081$). MetS was highly prevalent in the subjects belonging to the III group, with a rate of 95.0%, while 83.9% of individuals in class II and 69.2% of individuals in class I had this syndrome. The study revealed that MetS is a statistically significant predictor of structural knee damage ($p = 0.019$). On the other hand, in a univariate linear regression analysis, it was determined that the presence of MetS does not have statistical significance as a predictor for the knee's functional state ($p = 0.131$).

Conclusion: MetS is a statistically significant predictor of structural knee impairment but not functional knee impairment in patients with knee OA.

P606
SHOUD WE THINK ABOUT OSTEOPOROSIS IN PSORIATIC ARTHRITIS?

L. J. Bozic Majstorovic[1], I. Ovcina[1], J. Mrdja[1], D. Popovic[1], G. Vrhovac[1], N. Spiric[1]

[1]Univ. Clinical Centre of the Republic of Srpska, Banjaluka, Bosnia & Herzegovina

Objective: To detect correlation between clinical features and occurrence of osteoporosis in psoriatic arthritis (PsA) and to compare bone densitometry results between patients with PsA and healthy controls.

Methods: The 20 patients diagnosed with PsA were included in the study. The demographics, laboratory parameters, nail involvement, psoriasis area and severity index (PASI) score were collected. Patients underwent bone densitometry using DXA (Hologic) and the 10-y fracture risk was calculated with FRAX score. To compare bone densitometry parameters we included 14 healthy patients. Statistical significance was set at $p < 0.05$.

Results: The mean age was 58 ± 9.1 y and there were 55% male patients. Positive rheumatoid factor (RF) had 30% of the patients, nail lesions 60% and the mean PASI score were 10.37 ± 10.13 and the mean CRP 15.54 ± 10.08. The 35% patients received corticosteroids, 20% were smokers and the mean BMI 26.35 ± 3.83. The 30% of the patients had osteoporosis and 40% had increased fracture risk. There were significant relationship between RF and osteoporosis ($p = 0.002$) and the presence of nail lesion and high fracture risk ($p = 0.005$). There weren´t other significant relationships. The mean age of control group was 55.9 ± 7.4 and there were 50% male patients. There were difference between BMD and FRAX score in patients and control group but without statistical significance (Table 1).

Table 1. BMD and fracture risk in patients and controls

	Patients	Controls
L1-L4 BMD	0.94±0.22	1.03±0.22
T-score	-1.64±1.26	-1.42±0.8
LF BMD	0.90±0.17	0.89±0.93
T-score	-1.28±1.2	-1.24±0.64
RF BMD	0.89±0.14	0.91±0.06
T-score	-1.32±1.1	-1.08±0.54
FRAX major fracture	10.85±8.05	8.38±3.49
FRAX hip	3.71±3.24	2.48±1.3

Conclusion: There was a correlation between presence of positive RF in patients with PsA and PsA patients with nail lesions and high fracture risk. Therefore, in patients with PsA who are not on corticosteroid therapy but have positive RF and nail lesions, we must think about osteoporosis and high fracture risk in order to prevent fragility fracture. We need larger studies to definitively prove this relationship

P607
DIFFERENCES OF BMD BETWEEN HIP FRACTURED ELDERLY PATIENTS WITH AND WITHOUT DIABETES MELLITUS TYPE 2

I. P. Papaioannou[1], G. P. Pantazidou[2], Z. K. Kokkalis[3], N. G. Georgopoulos[4], E. J. Jelastopulu[5], A. B. Baikousis[6]

[1]Orthopedic Dept., General Hospital of Patras, [2]Univ. of Patras, Public Health Postgraduate Program, [3]Orthopedic Dept., Medical School, Univ. of Patras, [4]Endocrinology Dept., Univ. Hospital of Patras, [5]Dept. of Public Health, Univ. of Patras, [6]Orthopedic Dept. of General Hospital of Patras, Patras, Greece

Objective: To evaluate the differences of BMD measurements between hip fractured elderly patients with and without diabetes mellitus type 2 (T2DM)

Methods: We retrospectively studied 114 elderly patients (> 65 years old) with osteoporotic hip fractures, which were treated between January 2021 and January 2022. The non-diabetes group was consisted of 49 patients, while the diabetes group included 65 patients. 11 patients were newly diagnosed with impaired hemoglobin A1C (HbA1C) and switched to the diabetic group. 4 out of 11 patients were diagnosed with T2DM and 7/11 had prediabetes. We measured the values of BMD with DXA and/or quantitative ultrasound (QUS) of calcaneus

Results: Normal BMD values were not found in any patient of both groups. In non-diabetic group 73.5% (36/49) of patients were found with T-score lower than -2.5 and were diagnosed with osteoporosis. In contrary osteoporosis in diabetic group was diagnosed in 66.2% (43/65). Osteopenia (T-score between -1 and -2.5 was found in 26.5% (13/49) of non-diabetic patients and in 33.8% (22/65) of diabetic patients. Despite the differences of BMD between the two groups the statistical analysis (SPSS v 28.0) based on chi-square or χ^2 test did not reveal statistical significance ($p = 0.402$)

Conclusion: Our study, despite the small number of patients confirmed the fact that patients with T2DM are associated with higher BMD, although they are at increased risk for fracture. This paradox, which is strongly supported by the current literature should be taken into consideration by physicians for fracture prevention. TBS and revised FRAX-score are paramount of importance to achieve this goal. Bone fragility should be recognized as a new complication of T2DM, especially in elderly patients. The elderly patients are even more vulnerable to T2DM-induced bone fragility due to additional factors, such as senile osteoporosis, severe VD deficiency,

comorbidities, insulin usage, diabetes-related complications and especially diabetic neuropathy and retinopathy, predisposing to falls. Undiagnosed T2DM should be investigated to eliminate an additional risk factor for poor bone quality and all the well-known complications of T2DM

P608
IS HYPOALBUMINEMIA CORRELATED WITH HYPOVITAMINOSIS D IN ELDERLY WITH HIP FRACTURE WITH AND WITHOUT DIABETES MELLITUS TYPE2?

I. P. Papaioannou[1], G. P. Pantazidou[2], Z. K. Kokkalis[3], N. G. Georgopoulos[4], E. J. Jelastopulu[5], A. B. Baikousis[6]

[1]Orthopedic Dept., General Hospital of Patras, [2]Univ. of Patras, Public Health Postgraduate Program, [3]Orthopedic Dept., Medical School, Univ. of Patras, [4]Endocrinology Dept., Univ. Hospital of Patras, [5]Dept. of Public Health, Univ. of Patras, [6]Orthopedic Dept. of General Hospital of Patras, Patras, Greece

Objective: To identify if there is any correlation between hypoalbuminemia and hypovitaminosis d in diabetic and non-diabetic elderly with hip fracture
Methods: We retrospectively studied 114 elderly patients (> 65 years old) with low energy hip fractures, with and without history of diabetes mellitus type 2, which were treated in our department during the last 2 years between January 2021 and January 2023. We measured the values of albumin (alb) and 25 OH vitamin D (VD). The diabetic group was consisted of 65 patients and their counterparts were 49.
Results: The non-diabetic patients had mean value of albumin 2.94 ± 0.56 g/dL, while the diabetic group had 2.94 ± 0.53 g/dL. The results for VD were 10.03 ± 5.43 g/dL and 10.01 ± 5.09 g/dL respectively. In non-diabetic group we found 12 individuals with normal albumin levels (3.4–5.4 g/dL) with mean value of VD 10.24 ± 5.93 g/dL and 37 patients with hypoalbuminemia (< 3.4 g/dL) accompanied with mean value of VD 9.96 ± 5.34 g/dL. So, non-diabetic patients with hypoalbuminemia have lower levels of VD, although the statistical analysis didn't reveal any significance as the p-value was 0.743. The diabetic patients with sufficient albumin levels were 16 out of 65 with mean value of VD 12.30 ± 5.45 g/dL, while their counterparts with hypoalbuminemia had mean value of VD 9.26 ± 4.80 g/dL. In this group the difference of VD levels was statistically significant as the p-value was 0.038
Conclusion: Hypoalbuminemia was found to be prevalent among elderly patients with hip fracture, while VD deficiency and abnormal glycemic status were identified as risk factors for even lower levels of albumin. Decreased albumin should alert physicians for possible malnutrition and subsequence lower VD levels. VD deficiency, hypoalbuminemia and impaired glycemic status consist elements of a circle, which requires a holistic management of an elderly patient with low energy hip fracture

P609
PHOSPHORUS LEVELS IN DIABETIC PATIENTS WITH LOW ENERGY HIP FRACTURE

I. P. Papaioannou[1], G. P. Pantazidou[2], Z. K. Kokkalis[3], N. G. Georgopoulos[4], E. J. Jelastopulu[5], A. B. Baikousis[6]

[1]Orthopedic Dept., General Hospital of Patras, [2]Univ. of Patras, Public Health Postgraduate Program, [3]Orthopedic Dept., Medical School, Univ. of Patras, [4]Endocrinology Dept., Univ. Hospital of Patras, [5]Dept. of Public Health, Univ. of Patras, [6]Orthopedic Dept. of General Hospital of Patras, Patras, Greece

Objective: To identify if there is any difference of phosphorus levels between diabetic and non-diabetic elderly patients with hip fracture
Methods: We retrospectively studied 114 elderly patients (> 65 years old) with low energy hip fractures, with and without history of diabetes mellitus type 2, which were treated in our department during the last 2 years between January 2021 and January 2023. We measured the values of serum phosphorus (Ph), serum calcium (ca) and glomerular filtration rate (eGFR). The diabetic group was consisted of 65 patients and their counterparts were 49. Patients with chronic kidney disease (CKD) grades 4 and 5 were excluded from the study, because severe renal failure results in reduced synthesis of calcitriol and secondary hyperparathyroidism
Results: Serum calcium levels had no significant difference (p = 0.272) between non-diabetic and their counterparts (9.08 ± 0.5 vs. 9.19 ± 0.52 mg/dL respectively). GFR values differ between the two groups despite the exclusion of diabetic patients with CKD grades 4 and 5. The eGFR values were 72.14 ± 24.81 and 66.55 ± 21.43 for non-diabetic and diabetic patients respectively. Non-diabetic patients were found to have decreased e-GFR values, although the difference wasn't statistically significant (p = 0.178). Diabetic patients were found to have increased levels of Ph (3.22 ± 0.72 mg/dL) in comparison with their counterparts (2.91 ± 0.72 mg/dL). The difference was statistically significant p = 0.026
Conclusion: The diabetic group had increased levels of Ph compared with their counterparts, although the values of Ph were in normal limits. Diabetic patients of our studied had lower eGFR levels but not to that extent to result in hyperphosphatemia and increased PTH. Clinicians should be aware that hyperphosphatemia in severe CKD patients can lead to an increased risk of vascular calcification that increases the risk of cardiovascular events. It's worth noting that increased Ph contributes to vascular and metabolic disturbances in elderly patients with type 2 diabetes mellitus and further renal impairment

P610
PARATHORMONE FLUCTUATIONS IN DIABETIC AND NON-DIABETIC ELDERLY PATIENTS WITH LOW ENERGY HIP FRACTURE

I. P. Papaioannou[1], G. P. Pantazidou[2], Z. K. Kokkalis[3], N. G. Georgopoulos[4], E. J. Jelastopulu[5], A. B. Baikousis[6]

[1]Orthopedic Dept., General Hospital of Patras, [2]Univ. of Patras, Public Health Postgraduate Program, [3]Orthopedic Dept., Medical School, Univ. of Patras, [4]Endocrinology Dept., Univ. Hospital of Patras, [5]Dept. of Public Health, Univ. of Patras, [6]Orthopedic Dept. of General Hospital of Patras, Patras, Greece

Objective: To identify if there is any difference of PTH levels between diabetic and non-diabetic elderly patients with hip fracture
Methods: We retrospectively studied 114 elderly patients (> 65 years old) with low energy hip fractures, with and without history of diabetes mellitus type 2, which were treated in our department during the last 2 years between January 2021 and January 2023. We measured the values of 25 OH vitamin D (VD), PTH and glomerular filtration rate (eGFR). The diabetic group was consisted of 65 patients and their counterparts were 49. Patients with chronic kidney disease (CKD) grades 4 and 5 were excluded from the study, because severe renal failure results in reduced synthesis of calcitriol and secondary hyperparathyroidism
Results: VD levels were similar in both groups (10.03 ± 5.43 g/dL non-diabetic vs. 10.01 ± 5.09 g/dL diabetic) without any statistically significant difference (p = 0.986). PTH levels differ significantly between the two groups (p = 0.018). PTH levels in non-diabetic patients were 79.71 ± 57.6 pg/mL, while in diabetic patients the

values were 56.42 ± 45.57 pg/mL. The eGFR values were 72.14 ± 24.81 and 66.55 ± 21.43 for non-diabetic and diabetic patients respectively. Non-diabetic patients were found to have increased e GFR values, although the difference wasn't statistically significant (p = 0.178)

Conclusion: Secondary hyperparathyroidism (SHPT) is common among elderly due to two main causes: VD deficiency and renal failure. SHPT is often associated with disturbances of bone turnover, as well as visceral and vascular calcifications, which are responsible for cardiovascular morbidity and mortality. PTH acts as a stimulus for increased osteoclast activity, which results in calcium and phosphorus resorption from the bone. As GFR levels do not differ dramatically, a possible explanation of the difference between PTH levels is the dysfunction of parathyroid gland due to diabetic microangiopathy and the fact that only severe VD deficiency is correlated with increased levels of PTH. In our study severe hypovitaminosis d (< 10 g/dL) was prominent in non-diabetic group (59.2 vs. 56.9%)

P611
CLINICAL PATTERNS, DIAGNOSTIC ASSESSMENT AND MANAGEMENT OF ASYMPTOMATIC PRIMARY HYPERPARATHYROIDISM (APHPT) IN RIGA EAST CLINICAL UNIVERSITY HOSPITAL (RECUH) IN TERTIARY CARE HOSPITAL IN LATVIA: A 3-YEAR RETROSPECTIVE BASED STUDY

D. Stūrīte[1], I. Rasa[2]

[1]Rīga Stradiņš Univ. (RSU), Latvian Osteoporosis and Bone Metabolic Diseases Association (LOKMSA), [2]Latvian Osteoporosis and Bone Metabolic Diseases Association (LOKMSA), Riga East Clinical Univ. Hospital (RECUH), Riga, Latvia

Objective: Primary hyperparathyroidism and APHPT rank as the third most common endocrine disorder, displaying varying clinical presentation. The study aimed to evaluate clinical patterns and patients (pts) management with APHPT

Methods: Data from 168 pts with APHPT at RECUH between January 2021 and November 2023 were analysed, including medical records, lab findings, imaging, surgical protocols, and histopathology. We used IBM SPSS 29.0 for statistical analysis

Results: 168 pts (mean age: 63.7 ± 11.8 y), 86.3% (n = 145) were females, 13.7% (n = 23) males. The mean preoperative maximal calcium level was 2.9 ± 0.3 mmol/L, iPTH level 247.6 ± 224.9 pg/mL, minimal phosphorus 1.3 ± 6.7 mmol/L and 25-OH vitamin D level 28.3 ± 14.7 ng/mL. 5.3% (n = 9) had normocalcaemic APHPT. Parathyroid adenoma sizes ranged from 0.3 × 0.4 cm to 5.3 × 3.7 cm. Calcium levels positively correlated with adenoma cross-sectional area (ρ = 0.187, p = 0.029) and maximal dimension (ρ = 0.215, p = 0.011). Ultrasonography verified parathyroid adenomas in 63.9% (107/168), SPECT/CT 68.4% (52/76), 99mTc-sestamibi scintigraphy 65.6% (61/93), 3D-CT 70.6% (24/34), contrast-enhanced ultrasonography (CEUS) 84% (21/25) and MRI in 40% (2/5) cases. 12.5% (n = 21) of pts had unlocated parathyroid adenoma. 22.0% (n = 37) of pts had kidney stones, 17.3% (n = 29) gallstones, 34.5% (n = 58) osteoporosis, 12.5% (n = 21) osteoporotic fractures and 47.6% (n = 80) osteopenia. The mean preoperative eGFR was 90.6 ± 28.2 ml/min/1.73 m^2, creatinine—72.5 ± 23.9 μmol/L. 17.9% (n = 30) of pts received oral bisphosphonates, 4.0% (n = 7) intravenous bisphosphonates, 8.0% (n = 14) denosumab, and 1.1% (n = 2) had medication holidays. 80.4% (n = 135) of patients had thyroid nodules, 48.2% (n = 81) had nontoxic goiter, and 24.4% (n = 31) had autoimmune thyroiditis. 18.5% (n = 31) of pts were found to have a diagnosis of malignancy. 61.9% (n = 104) of pts underwent parathyroidectomy. Histopathology and radiologic imaging revealed a single parathyroid adenoma in 95.2% (n = 99), double parathyroid adenomas in 1.9% (n = 2), parathyroid hyperplasia in 2.9% (n = 3) and parathyroid carcinoma in 1.9% (n = 2) pts. The mean maximal postoperative calcium level (n = 103) was 2.4 ± 0.1 mmol/L, iPTH (n = 101) 63.5 ± 27.7 pg/mL, 25-OH vitamin D 41.5 ± 13.3 ng/mL, and mean minimal phosphorus (n = 56) 1.1 ± 0.2 mmol/L. Three pts developed hungry bone syndrome following parathyroidectomy. Three required reoperation

Conclusion: APHPT is common, often exhibiting bone manifestations. The sensitivity of diagnostic modalities and the prevalence of osteoporosis differed from what has been reported in Western Europe and the USA, with osteoporosis occurring more frequently. It's crucial to consider the diverse clinical manifestations in pts with APHPT

P612
EVALUATION OF THE EFFECTIVENESS OF LOCAL THERAPY OF EROSIVE OSTEOARTHRITIS OF SMALL WRIST JOINTS

B. S. Bekmurzoda[1], I. S. Kniazev[1]

[1]Avicenna Tajik State Medical Univ., Dushanbe, Tajikistan

Objective: Erosive osteoarthritis (OA) of the wrist joints more often affects the proximal interphalangeal joints and is radiologically characterized by subchondral erosions, which can progress to the bone and cartilage destruction, significant instability and bone ankylosis. Usually, the erosive form of OA has a sudden onset, severe pain syndrome and functional disorders, inflammatory symptoms (stiffness, soft tissue edema, erythema, paresthesia), moderately elevated C-reactive protein (CRP) levels and a worse outcome in comparison with non-erosive OA

Methods: We observed 115 patients with erosive osteoarthritis of small joints of the wrists. 83 patients had type 2 diabetes mellitus. The average age of the patients was 61 ± 3.4 y. All patients received therapy with chondroitin sulfate, ointments containing nonsteroidal anti-inflammatory drugs. Before the providing of local therapy with the use of the biopolymer microheterogenic collagen-containing implant the estimated value of pain according to VAS was 65 ± 12.3, the value of stiffness according to WOMAC was 9.4, the value of functionality according to WOMAC was 90 ± 1.4, the value of the HAQ index was 1.2 ± 0.3. Three procedures with the 2 weeks intervals between them of peri-tendon injections of the biopolymer microheterogenic collagen-containing implant to the tendons of the extensors of the fingers of the wrists in the projection of the Heberden nodules were provided by ultrasound navigation control

Results: We estimated the effectivity of peri-tendon injections of biopolymer microheterogenic collagen-containing implant after 4 weeks from the third procedure. WOMAC pain index was reduced on 52%, the WOMAC functionality index was reduced from 90 to 42 (on 47%), and the VAS pain index from 65 to 35 (on 54%). HAQ was reduced till 0.6

Conclusion: The local peri-tendon injections of biopolymer microheterogenic collagen-containing implant were effective in pain control and improvement of the wrist function in the patients with the erosive OA of the wrist joints

P613
UNILATERAL FEMORAL HEAD POST-COVID19 ASEPTIC NECROSIS: PERSPECTIVES OF LOCAL THERAPY

B. S. Bekmurzoda[1], I. S. Kniazev[1]

[1]Avicenna Tajik State Medical Univ., Dushanbe, Tajikistan

Objective: The COVID-19 pandemic was marked by an increased number of cases of aseptic necrosis of bone tissue of various

localization. The undisputed leader in frequency of occurrence is aseptic necrosis of the femoral head (ANFH), approximately 39% of patients infected with SARS-CoV-2 developed femoral head necrosis a few months after infection

Methods: 63 patients with ASNFH (age 49.5 ± 3.8 y (36 women and 27 men)) were observed in the period from 2022–2023. All patients received therapy using NSAIDs, calcium containing drugs and bisphosphonates. The duration of the period from the transferred COVID19 to the moment of the appearance of clinical signs of hip joint damage was 125 ± 18 d. In 57 patients, II degree and 6 patients with the IIIA degree of ASNFH occurred according to MRI classification. From these cohorts, patients with the II degree of ANFH got 4 intrajointal injections (once in 3 months) under ultrasound control of the biopolymer microheterogenic collagen-containing implant with the size of microparticles of the crosslinked collagen fraction not exceeding 100–200 microns. Patient with the IIIA degree of ASNFH got 3 intrajointal injections (once in 4 months) of the biopolymer microheterogenic collagen-containing implant with the size of microparticles of the crosslinked collagen fraction not exceeding 250–300 microns

Results: At the end of the course of local therapy (4 weeks after last intrajointal procedure), patients in both groups showed a decrease in the WOMAC pain index from 9.8 to 5, a decrease in the WOMAC functionality index from 70 to 42, and a decrease in the VAS pain index from 80 to 30. In addition, none of the patients from the observed cohorts underwent total hip replacement

Conclusion: the results of the observation demonstrate the effectiveness of local therapy of post-COVID19 aseptic femoral necrosis using a biopolymer microheterogenic collagen-containing implant in terms of improved joint function and provided the possibility of preventing joint replacement in this category of patients

P614
PELVIC RADIOTHERAPY AND BONE TOXICITY: A LATE EFFECT

I. Santos[1], R. Evangelista[2], I. Almeida[1], N. Martins[1], P. Monteiro[1], V. Ermida[2], J. Caldas[2]

[1]Rheumatology Unit, [2]Dept. of Physical Medicine and Rehabilitation, Centro Hospitalar Tondela-Viseu, Viseu, Portugal

Objective: Pelvic radiotherapy is a known cause of insufficiency fractures and avascular necrosis. Postmenopausal women with osteoporosis constitute the highest risk population

Methods: Based on clinical observation of a patient with pelvic radionecrosis

Results: A 69-year-old overweight female seeks the Emergency Department for left inguinal pain lasting 2 weeks, with sudden onset after bending forwards to take off her shoes. Her medical history includes early menopause at 42, uterine carcinoma treated with radiotherapy 26 years ago, a left Colles' fracture and a dropped foot due to iatrogenic injury of the right superficial and deep peroneal nerves. On physical examination, she presents painful flexion of the left hip above 90°. Pelvic X-ray reveals a left ischiopubic ramus fracture and she initiates weekly alendronate 70 mg. Lumbosacral MRI identifies a fracture of L5 and heterogeneous hypersignal on the left side of the sacrum. Despite analgesic therapy adjustments and rehabilitation program, she maintains pain complains. Bone scintigraphy shows suspicious changes compatible with secondary lesions in the left ischiopubic ramus, sacroiliac joints, L5 and L5–S1. Additional studies do not identify other lesions suggestive of primary or secondary neoplasms. Pelvic MRI presents extensive signal alterations in both sacral wings, predominantly on the left with extension to soft tissues (Fig. 1). A bone biopsy concludes remodeling radionecrosis. Bone densitometry reveals a T-score of − 3.9 for the lumbar spine and − 2.3 for the femoral neck. She is referred to rheumatology consultation for therapeutic adjustment with semi-annual denosumab 60 mg, monthly calcifediol 0.266 mg and daily calcium carbonate + cholecalciferol 1500 mg + 400 IU

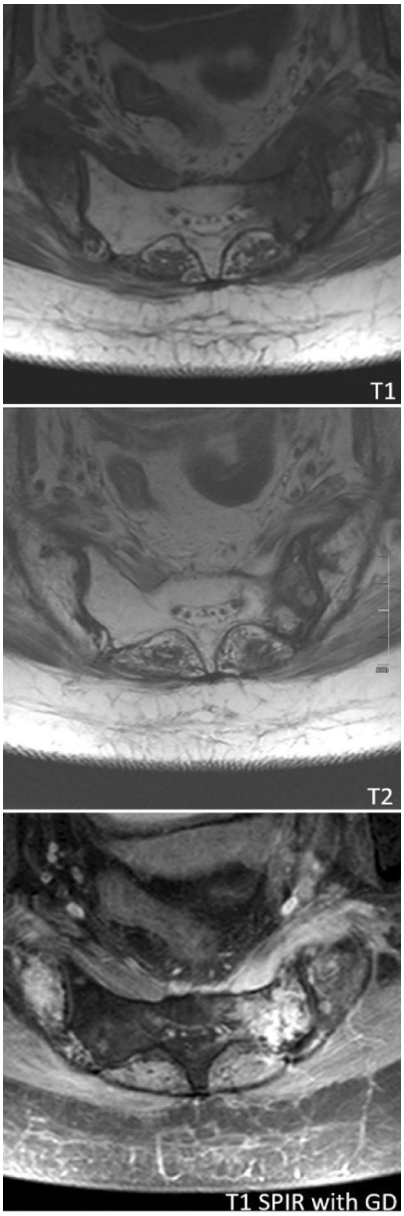


Figure 1: Pelvic MRI

Conclusion: In patients with a history of malignancy, the differential diagnosis between insufficiency fracture and metastatic bone disease is extremely relevant, given the therapeutic and prognostic implications

P615
FEMORAL NECK FRACTURE AT THE 9TH KM MARK OF A TRAIL RUN

I. Santos[1], R. Evangelista[2], I. Almeida[1], N. Martins[1], P. Monteiro[1], I. Inácio[3], V. Ermida[2], J. Caldas[2]

[1]Rheumatology Unit, Centro Hospitalar Tondela-Viseu[2]Dept. of Physical Medicine and Rehabilitation, Centro Hospitalar Tondela-Viseu, [3]USF Coração da Beira, ACES Dão Lafões, Viseu, Portugal

Objective: Femoral neck fragility fractures (FNF) are uncommon in athletes. Women with eating disorders, amenorrhea, decreased BMD and a sudden increase in training volume constitute the highest risk population

Methods: Based on clinical observation of a patient with FNF

Results: A 38-year-old female athlete experienced a "pop" in her right hip with immediate functional impairment at the 9th kilometer of a trail run. In the Emergency Department, she presented with right inguinal pain and was unable to bear weight on the limb. Right hip radiography revealed FNF (Fig. 1). She underwent closed reduction and stabilization with three cannulated screws. A rehabilitation program was initiated at 12 weeks, focusing on joint range of motion, peri-articular muscle strengthening and gait training. She also underwent aquatic treadmill sessions with good progress. The patient had chronic urticaria and irritable bowel syndrome, managed with ketotifen and clidinium bromide. She was a former smoker with a BMI of 17.1 kg/m^2. No history of eating disorders, or gynecological or obstetric conditions was reported. She had resumed sports activity one year before the current episode, after a two-year hiatus following the birth of her only child. She had showed sporadic right inguinal discomfort during training for the previous 6 months. Bone densitometry revealed a Z-score of − 2.8 for the lumbar spine and + 0.3 for the contralateral femoral neck. Alendronate, calcium and vitamin D supplementation were initiated. She was referred to Rheumatology consultation for secondary osteoporosis exclusion. Analytically, she had a vitamin D deficiency (13 ng/mL) and hyperhomocysteinemia 15.4 µmol/L (normal range: 3.7–13.9), with no other significant abnormalities. No dorsolumbar fractures were observed

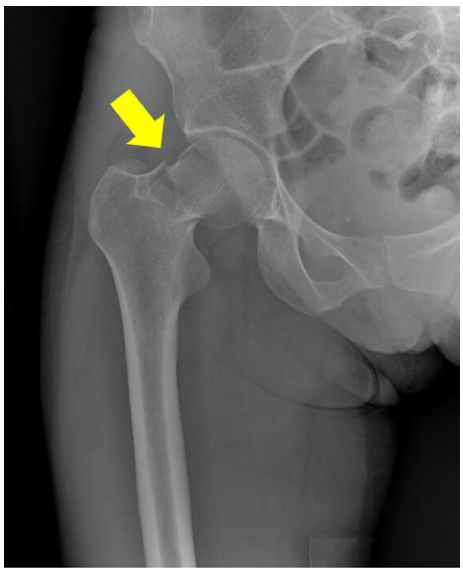


Figure 1: Right hip radiography with femoral neck fracture (arrow)

Conclusion: The inappropriate progression in training volume combined with the patient's low BMD and BMI resulted in FNF. The optimization of risk factors in a multidisciplinary team and the implementation of an individualized rehabilitation program allowed the improvement of functional outcomes and a safe return to sports activity

P616
CHRONIC KIDNEY DISEASE—MINERAL AND BONE DISORDER: DEMOGRAPHIC AND CLINICAL DIFFERENCES IN A COHORT WITH PROXIMAL FEMUR FRAGILITY FRACTURE

I. Santos[1], G. Terroso[2], C. Marques-Gomes[2], M. Diz-Lopes[2], L. Costa[2]

[1]Rheumatology Unit, Centro Hospitalar Tondela-Viseu, Viseu, [2]Rheumatology Dept., Centro Hospitalar Universitário São João, Porto, Portugal

Objective: To identify demographic or clinical differences in patients with and without chronic kidney disease (CKD) who had experienced a proximal femur (PF) fragility fracture (FF).

Methods: Retrospective single-center study including patients aged 50 years or older who were referred to a Fracture Liaison Service during their hospitalization in an Orthopedics department due to PFFF, registered in Reuma.pt FF protocol. Individuals were grouped based on their glomerular filtration rate according to 2021 CKD-Epidemiology Collaboration equation either as CKD (< 60 mL/min/1.73 m^2) or non-CKD patients (≥ 60 mL/min/1.73 m^2). Demographic and clinical data were collected and compared between groups

Results: A total of 230 patients were included. 64 patients presented CKD (27.8%), of which 84.4% stage 3 (n = 54), 12.5% stage 4 (n = 8) and 3.1% stage 5 (n = 2), these latter on hemodialysis. Osteoporosis (OP) was diagnosed in 93.9% (n = 216). In the remaining, adynamic bone disease was weighed, with 4.8% having presumed diagnosis (n = 11) and 1.3% currently being considered for bone biopsy (n = 3). Most patients were females (n = 199, 86.5%), all postmenopausal. CKD patients were considerably older than non-CKD (84.0 ± 7.3 vs. 79.3 ± 7.8 y, p = < 0.001). No significant differences were found regarding other health conditions or drugs that induce OP, although CKD patients tended to have higher rates of early menopause [n = 11 (23.4%) vs. n = 14 (11.8%), p = 0.059] and furosemide use [n = 3 (4.7%) vs. n = 1 (0.6%), p = 0.066]. CKD patients had higher phosphate (mean 3.6 ± 0.5 vs. 3.4 ± 0.5 mg/dL, p = 0.014) and PTH levels [median 65.9 (52.8) vs. 44.6 (28.3) pg/mL, p = < 0.001]. With no group differences, 50.4% (n = 116) had at least one previous FF (p = 0.250) and 7.7% (n = 17) had a history of parental PFFF (p = 1.000). Overall, median femoral neck T-score was − 2.7 (1.4) (p = 0.583) and 14.3% of the patients (n = 33) had received prior anti-OP drugs (p = 0.360)

Conclusion: CKD patients were older and tended to have greater rates of early menopause and furosemide use, as well as higher phosphate and PTH levels. However, CKD did not impact the existence of prior FF, history of parental PFFF, femoral neck T-score, or previous use of anti-OP drugs

P617
CHRONIC KIDNEY DISEASE—MINERAL AND BONE DISORDER: THERAPEUTIC DIFFERENCES IN A COHORT WITH PROXIMAL FEMUR FRAGILITY FRACTURE

I. Santos[1], G. Terroso[2], M. Diz-Lopes[2], C. Marques-Gomes[2], L. Costa[2]

[1]Rheumatology Unit, Centro Hospitalar Tondela-Viseu, Viseu, [2]Rheumatology Dept., Centro Hospitalar Universitário São João, Porto, Portugal

Objective: To identify therapeutic differences in patients with and without chronic kidney disease (CKD) who had experienced a proximal femur (PF) fragility fracture (FF)
Methods: Retrospective single-center study including patients aged 50 years or older who were referred to a Fracture Liaison Service during their hospitalization in an Orthopedics department due to PFFF, registered in Reuma.pt FF protocol. Individuals were grouped based on their glomerular filtration rate according to 2021 CKD-Epidemiology Collaboration equation either as CKD (< 60 mL/min/1.73 m^2) or non-CKD patients (≥ 60 mL/min/1.73 m^2). Diagnostic and therapeutic data were compared between groups
Results: A total of 230 patients were included. 64 patients presented CKD (27.8%), of which 84.4% stage 3 (n = 54), 12.5% stage 4 (n = 8) and 3.1% stage 5 (n = 2), these latter on hemodialysis. Osteoporosis (OP) was diagnosed in 93.9% (n = 216). In the remaining, adynamic bone disease (ABD) was weighed, with 4.8% having presumed diagnosis (n = 11) and 1.3% currently being considered for bone biopsy (n = 3). No significant differences were found regarding previous use of anti-OP drugs (p = 0.360). Overall, alendronate was the most frequent first prior drug (n = 24, 72.7%). On the other hand, current treatment significantly differed between groups ($p < 0.001$). Alendronate and zoledronate were more frequently used in non-CKD patients than in CKD patients [respectively, n = 22 (13.3%) vs. n = 0 (0.0%), p = 0.002 and n = 61 (36.7%) vs. n = 12 (18.8%), p = 0.009]. Denosumab was more commonly employed in the CKD group [n = 37 (57.8%) vs. n = 61 (36.7%), p = 0.004], with CKD patients having 2.4 times the odd of non-CKD patients to receive denosumab (OR = 2.4, 95% CI 1.3–4.2, p = 0.004). None of the 11 patients with presumed ABD were receiving anti-OP therapy, as well as 2 of the 3 patients being considered for bone biopsy (66.7%). The other patient (33.3%) was maintaining denosumab while awaiting the decision of bone biopsy
Conclusion: Alendronate and zoledronate were preferred in non-CKD patients and denosumab in CKD patients, the latter probably due to safety concerns. Antiresorptive agents are discouraged in ABD to avoid further suppression of bone turnover. Anabolic agents may be beneficial but have not yet been approved for its treatment. Therefore, most patients with suspected ABD were not under any therapy

P618
SYSTEMIC INFLAMMATION MARKERS AND LEAN MASS IN IBD YOUNG PATIENTS

I. Soare[1], A. Sirbu[1], M. Diculescu[1], B. Mateescu[1], C. Tieranu[1], L. Cima[1], S. Fica[1]

[1]Univ. of Medicine and Pharmacy Carol Davila Bucharest, Bucharest, Romania

Objective: Inflammatory bowel disease (IBD), comprising Crohn's disease (CD) and ulcerative colitis (UC) represents a chronic gastrointestinal disease. Chronic inflammatory state has been reported to be associated with low muscle mass. We aimed to study the impact of systemic inflammation (SII) scores on muscle mass in IBD patients
Methods: Anthropometric data were collected, and all patients underwent blood tests measurements. ASMI (appendicular muscle skeletal index) was determined using DXA whole body was measured using albumin levels, prognostic nutritional index (PNI), neutrophil–lymphocyte ratio (NLR), and platelet-lymphocyte ratio (PLR). Low lean mass represented an ASMI Z-score < -1SD for age and gender, using NHANES scales
Results: A multicentric cross-sectional study was conducted on 56 young IBD patients (36 with CD, 20 with UC), 36 women, median age 33 (IQR18) y, mean duration of disease 6 (IQR6) y, BMI 22.2 ± 4.7 kg/m^2. Low lean mass was present in half of the patients evaluated. ASMI correlated negatively with PLR ($r = -0.402$, $p = 0.003$) and positively with PNI ($r = 0.429$, $p = 0.003$). The best parameter to differentiate between normal or low lean mass is PNI (ROC AUC = 0.735, p = 0.005)
Conclusion: Low muscle mass is a frequent complication, even in young IBD patients. PNI could represent an important parameter to assess the risk of low muscle mass in these patients

P619
MAXILLARY INTERRADICULAR ALVEOLAR BONE STRUCTURE AFTER IMPLANTATION OF CERAMIC HYDROXYLAPATITE OK-015 INTO THE TIBIA

A. Pilavov[1], I. Solovyova[1], V. Ryabkov[1], M. Trufanova[1]

[1]FSBEI HI St. Luka LSMU of MOH of Russia, Lugansk, Russia

Objective: To analyze changes in structure of maxillary interradicular alveolar bone after implantation of ceramic hydroxyapatite OK-015 into the tibia
Methods: 90 male rats with body weight of 190–225 g were used. Animals were distributed into three groups. Group 1 consisted of the intact animals. Group 2 consisted of the animals with tibia fracture modeled as 2-mm round openings in both tibiae. In animals of the group 3 the same openings were filled with hydroxyapatite material OK-015. Hematoxylin–eosin stained sections of the maxillary interradicular septum (MSI) behind the first molar tooth (M1) were photographed under the light microscope and images were used for histomorphometry. Bone volume fraction (BV), trabecular thickness (TrT), and intertrabecular spaces (ISp) were calculated using standard methods. Measurements were performed at the MSI next to the first molar. The data obtained were analyzed with the use of variation statistics methods
Results: In the group 2 BV at the MSI of M1 was lower than that of the group 1 by 5.86%, 7.43%, 6.97%, and 4.95% in the period from the 15th to the 90th day after surgery, and TrT—by 4.48%, 8.33%, 7.75%, 7.52%, and 5.38% in the period from the 7th to the 90th day after surgery. ISp in the period from the 7th to the 90th day widened in comparison with those of the group 1 by 5.57%, 6.81%, 7.07%, 9.58%, and 5.93%. In the group 3, BV values at the MSI of M1 decreased in comparison with the group 2 by 6.22% on the 15th day and TrT decreased by 5.25% and 6.19% by the 7th and the 15th day. ISp in the same period increased by 5.28% and 5.47%. By the 60th and 90th day BV values exceeded those of the group 2 by 7.49% and 5.69% and TrT by the 60th day—by 5.02%. ISp on the 90th day decreased by 5.13% in comparison with the group 2
Conclusion: Implantation of OK-015 into the tibia reduces adverse effects of intervention on MSI structure beginning from the 60th day after intervention

P620
FREQUENCY OF VITAMIN D DEFICIENCY AND HYPOCALCEMIA IN PREGNANCY

R. Alimanovic-Alagic[1], I. Surkovic[2], A. Bazdarevic-Rasidagic[3], N. Kulenovic-Kokorovic[4], S. Saric[5]

[1]Clinica for Nuclear Medicine and Endocrinology, [2]Clinic for Nuclear medicine and Endocrinology, [3]Public Medical Care Sarajevo, [4]Institute for the Protection of Women and Maternity, [5]Public Medical Care Institution, Sarajevo, Bosnia & Herzegovina

Objective: Vitamin D is a nutrient that helps our body for good health. It helps our body absorb calcium, one of the main building blocks for strong bones. Vitamin D also has a role in our nervous, muscle, and immune systems. People can get vitamin D in three ways: through from skin, from diet, and from supplements
Methods: As a part of the investigational project 254 pregnant woman were examined at the Clinic for Nuclear medicine and Endocrinology of the University Clinical Center of Sarajevo, age 20–40 during 12 months. The study was designed as prospective. For each patient we did personal history, BMI, which is pregnancy in order, trimester of pregnancy. We established presence of risk factors (of, smoking), poor nutrition, chronic diseases, physical activity
Results: In investigated group of 254 patients three factors leading for vitamin D deficiency and hypocalcemia development are: poor nutrition (45%), no physical activity (26%) and endocrine presence frequently vitamin D deficiency and hypocalcemia (23%)
Conclusion: Vitamin D deficiency is thought to be common among pregnant women in some populations, and has been found to be associated with an increased risk of pre-eclampsia, gestational diabetes mellitus, preterm birth, and other tissue-specific conditions. The signs and symptoms of hypocalcemia are dependent on the severity, rapidity of development, the rate of decline of serum calcium, and duration of the hypocalcemia varying from an asymptomatic biochemical abnormality to a life-threatening disorder. Pregnant women should be encouraged to receive adequate nutrition, which is best achieved through consumption of a healthy balanced diet. The daily upper limits for vitamin D include intakes at pregnant and breast-feeding teens and women 100 mcg (4000 IU)

P621
REFERENCE INTERVALS FOR SERUM CONCENTRATIONS OF BONE ALKALINE PHOSPHATASE FOR GREEK ADULT MEN AND WOMEN

I. Trifonidi[1], P. Loukas[2], S. Tournis[3], E. Cavalier[4], E. Chronopoulos[3], K. Makris[5]

[1]KAT General Hospital/Clinical Biochemistry Dept,. Kifissia, Greece, [2]Clinical biochemistry Dept., KAT General Hospital, Liege, Belgium, [3]Laboratory of Research of Musculoskeletal System "Th. Garofalidis", KAT General Hospital, Medical School, Univ. of Athens, Athens, Greece, [4]Dept. of Clinical Chemistry, Univ. of Liege, CHU de Liege, CIRM, Liege, Belgium, [5]Clinical biochemistry Dept., KAT General Hospital, Kifissia, Greece

Objective: Bone turnover markers (BTMs) reflect the metabolic activity of bone tissue and can be used to monitor osteoporosis therapy. To adequately interpret BTMs, method-specific and population specific reference intervals are needed. We aimed to determine reference intervals for serum concentrations of bone specific alkaline phosphatase (bALP).
Methods: We collected samples from 431 apparently healthy Greeks (140 men, 150 pre- and 139 postmenopausal women), who volunteered to participate in our study. Data on sociodemographic characteristics, medical histories and medications were collected and subjects with conditions or receiving medications that affecting bone metabolism were excluded. DXA used to measure BMD in all participants. All blood collections were performed in the morning after overnight fast. Serum bALP concentrations were measured by an automated immunoassay on the ISYS analyzer (Immunodiagnostic Systems, Boldon, UK). The reference interval was defined as the central 95% range. We determined reference intervals according to CLSI guide C28-A3 and using the MedCalc Software.
Results: The mean age of men, pre- and post-menopausal women were 50.7, 40.7 and 58.4 years respectively. DXA results revealed that 348 participants had normal BMD, 74 were osteopenic and 9 had osteoporosis who excluded from analysis. Since our data were not normally distributed (Shapiro–Wilk test) in any group and after the exclusion of outliers (Tukey test), we used the non-parametric method suggested by the CLSI guide in order to determine the reference intervals. We found out that subjects with osteopenia exhibited significantly higher values for bALP compared to those with normal BMD [median (25,75 percentiles)] 12.8 μg/mL (10.07–16.35) vs. 16.13 μg/mL (12.61–20.10). No significant differences were observed between men and women. The majority of subjects with osteopenia (94.59%) were over 50 years old. Subsequent analysis according to age revealed that subjects over the age of 50 had significantly higher bALP values compared to younger individuals. For subjects > 50 y the reference intervals were calculated as 7.80–28.40 μg/mL, and for subjects < 50 years 3.73–20.52 μg/mL.
Conclusion: We provide reference intervals for bALP concentrations in serum for the Greek adult population using an automated immunoassay. Our data may aid to interpret bone turnover in the Greek adult population.

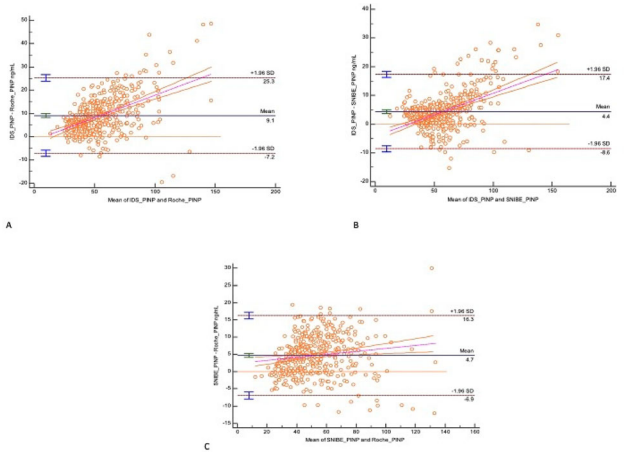
P622
EVALUATION OF HARMONIZATION STATUS OF N-TERMINAL PROPEPTIDE OF TYPE I PROCOLLAGEN (P1NP)

I. Trifonidi[1], P. Loukas[2], S. Tournis[3], E. Cavalier[2], E. Chronopoulos[3], K. Makris[4]

[1]KAT General Hospital/Clinical Biochemistry Dept., Kifissia, Greece, [2]Dept. of Clinical Chemistry, Univ. of Liege, CHU de Liege, CIRM, Liege, Belgium, [3]Laboratory of Research of Musculoskeletal System "Th. Garofalidis", KAT General Hospital, Medical School, Univ. of Athens, Athens, Greece, [4]Clinical biochemistry Dept., KAT General Hospital, Kifissia, Greece

Objective: Biochemical bone turnover markers (BTM) are useful tools to assess bone remodelling at the cellular level. P1NP has been recommended as a reference marker for bone formation in research studies. However, the absence of standardization may hinder results interpretation due to discrepancies between different commercial assays. This study aims to evaluate the current status of harmonization of three commercial assays measuring P1NP
Methods: Serum samples from 431 subjects (348 healthy donors, 74 osteopenic and 9 osteoporotic patients) were collected in Athens, Greece and were tested in Athens and Liege, Belgium with three automated commercial assays (IDS on ISYS, Roche on Cobas e-411 and SNIBE on Maglumi-X3). All measurements were performed according to manufacturers instructions. Passing-Bablok regressions, Bland–Altman plots, and the concordance correlation coefficient (CCC) between methods were used to determine the agreement between results
Results: Three paired comparisons were performed (IDSvsRoche, SNIBEvsRoche and IDSvsSNIBE). Bland–Altman analysis (figure) and Passing-Bablok regression revealed small but significant proportional and systematic bias between the three methods. In all paired comparisons intercept's 95% CI did not include 0 [1.57 (0.05, 3.19),

2.15 (0.52, 3.77) and 1.54 (0.11, 2.99) respectively] and slopes did not include 1 [0.82(0.79, 0.85), 1.09 (1.06, 1.14) and 0.90 (0.88, 0.93) respectively]. Calculation of CCC revealed a moderate agreement between the three methods (0.94 0.93 and 0.94 respectively)



Conclusion: Harmonization of P1NP assays is necessary in order to use results from all commercial assays interchangeably. Production and use of certified reference materials to calibrate assays will help to achieve this goal

P623
BONE METABOLISM IN PATIENTS WITH NORMOCALCEMIC PRIMARY HYPERPARATHYROIDISM

I. Yankova[1], A. Shinkov[1], R. Kovatcheva[1]

[1]Dept. of Endocrinology, Medical Univ. of Sofia, Sofia, Bulgaria

Objective: Normocalcemic primary hyperparathyroidism (nPHPT) is a condition characterized by persistently high levels of PTH and normal serum calcium levels in the absence of other causes for secondary hyperparathyroidism. The aim of the present study was to assess the biochemical characteristics, the markers of bone metabolism and the BMD in patients with nPHPT and to compare them with those in patients with hypercalcemic PHPT (hPHPT) and in healthy control group

Methods: The study included 352 patients (310 women and 42 men, average age 59.1 ± 11.9) diagnosed with PHPT. A control group of 74 age- and sex-matched subjects without bone disorders was defined. Total serum calcium, inorganic phosphates (PO_4), PTH, urinary Ca (uCa), albumin, creatinine, 25(OH)D and bone markers (b-CTX and ALP) were examined in all participants. BMD of the lumbar spine (LS), distal third of the radius (DR), femoral neck (FN) and total proximal femur (TF) were measured by a DXA. The PHPT patients were divided into two groups according to albumin-corrected calcium (Ca) level – with hPHPT (Ca > 2.62 mmol/L) and with nPHPT (Ca 2.12–2.62 mmol/l), without other causes for secondary hyperparathyroidism

Results: The frequency of nPHPT was 16.5%. Normocalcemic patients had lower levels of PTH, higher PO_4 and 25(OH)D, and smaller parathyroid adenomas. No significant difference in the bone markers, prevalence of osteoporosis and low-energy fractures was found between nPHPT and hPHPT. There was no difference in BMD between the two groups. The patients with nPHPT had lower BMD LS and DR and higher prevalence of osteoporosis compared to the control group

Conclusion: The patients with nPHPT show a more favorable biochemical profile compared to those with hPHPT. Nevertheless, clinical manifestations and complications are similar, with no significant difference in the BMD, the prevalence of osteoporosis and low-energy fractures

P624
ASSESSMENT OF RISK OF OSTEOPOROSIS AND OSTEOPOROIC FRACTURES IN MALE PATIENTS WITH CORONARY HEART DISEASE

Y. Popenko[1], T. Shaldybin[2], N. Shadchneva[1], E. Dolya[1], A. Zayaeva[1], I. Yatskov[1], V. Kaliberdenko[1], E. Kuliyeva[1]

[1]V.I. Vernadsky Crimean Federal Univ., [2]Medaira Clinic, Simferopol, Russia

Objective: An impact on common risk factors for coronary heart disease (CHD) and osteoporosis (OP) will prevent severe complications of both diseases. The purpose of this work was to study risk factors for AP and osteoporotic fractures in male patients with coronary artery disease

Methods: The risk factors for AP and osteoporotic fractures were studied in 102 men aged 51–75 years old (median age 61 y) with coronary artery disease verified by coronary angiography. Based on the result of dual-energy absorptiometry according to the T-score of the lumbar spine and femoral neck, BMD was assessed in all patients as follows: normal BMD (T-score ≥ − 1), osteopenia (T-score from − 1 to − 2.5) and OP (T-criterion ≤ − 2.5). The FRAX calculator was used to estimate the risk of major osteoporotic and proximal femoral fractures over the next 10 y

Results: According to BMI, the patients were distributed as follows: normal BMI was noted in 21.6%, elevated—in 56.9%, obesity (BMI ≥ 30 kg/m^2)—in 21.6% of patients. No body weight deficiency (BMI < 18.5 kg/m^2) was detected in patients. Of all the patients examined, 61.7% of men smoked. Previous fractures were recorded in 21.6% of cases, and a history of a hip fracture in parents was recorded in 6.9%. According to the BMD status, the majority of patients (79.4%) had osteopenic syndrome (OPS), in the structure of which osteopenia occurred in 47.0% of patients, and AP in 32.4%. A high risk of major fractures according to FRAX was detected in 10.8%, a high risk of hip fractures in 3.9% of patients. Correlation analysis showed a significant negative correlation between BMI and the risk of hip fracture according to the FRAX scale (r = 0.23; p = 0.020)

Conclusion: The significant prevalence of APS demonstrates a high proportion of the combination of the atherosclerotic process with low BMD among men with coronary artery disease aged 51–75 y. An increased risk of hip fracture according to the FRAX score is associated with a decrease in BMI in men with coronary artery disease over 50 years of age

P625
A CASE OF MAFFUCCI SYNDROME IN A 17-YEAR-OLD FEMALE WITH MULTIPLE ENCHONDROMAS, OSTEOCHONDROMA AND CAVERNOUS HEMANGIOMAS

I.-S. Chirică[1], F.-I. Ionete[1], O. Vutcanu[1], M. Bojincă[1]

[1]"Dr. Ion Cantacuzino" Clinical Hospital, Bucharest, Romania

This case report aims to comprehensively present the clinical manifestations, diagnostic investigations, and histopathological findings of a 17-year-old female with Maffucci syndrome, a rare disorder characterized by the coexistence of multiple enchondromas, osteochondroma, and cavernous hemangiomas.

Casereport: The patient's medical history, clinical examinations, and a series of diagnostic investigations were systematically reviewed. Previous surgical interventions, radiological studies, and ultrasound evaluations were considered, along with the current admission findings. Surgical excision of formations in the right armpit was performed, and the specimens were sent for histopathological evaluation. The patient's history revealed a diagnosis of enchondromatosis at the age of 5, with subsequent surgical interventions for osteochondromas in the left femoral neck and proximal tibia. Radiological studies indicated skeletal asymmetry, dysplastic changes in the left forearm, and the presence of enchondromas. Soft tissue ultrasounds identified formations in the right axilla, prompting further investigation. Clinical examination at the current admission revealed subcutaneous formations in the right armpit, and targeted imaging studies suggested calcifications associated with a hemangioma. Surgical excision of these formations confirmed cavernous hemangiomas through histopathological evaluation, revealing dilated blood vessels with microcalcifications.
Conclusion: This case highlights the complexity of Maffucci syndrome, characterized by the coexistence of multiple enchondromas, osteochondroma, and cavernous hemangiomas. The varied clinical manifestations, diagnostic challenges, and the importance of multidisciplinary collaboration are emphasized. Surgical intervention and histopathological evaluation played a crucial role in confirming the diagnosis and providing insights into the patient's condition.

P626
BONE DENSITOMETRY BY RADIOFREQUENCY ECHOGRAPHIC MULTI-SPECTOMETRY (REMS) IN KIDNEY TRANSPLANT RECIPIENTS

J. A. Fernández[1], M. Reina[1], D. Andrade[1], A. Medina[1]

[1]Fundación Universitaria de Ciencias de la Salud (FUCS), Bogotá, Colombia

Objective: Characterize BMD in kidney transplant recipients (KTR) and determine the presence of post-renal transplant mineral bone disease (post-RTx-MBD) by REMS considering the limitations of DXA in special population.
Methods: Exploratory cross-sectional study was performed including 26 KTR in whom REMS-BMD was characterized by T-score in > 50 y; and Z-score in < 50 y. Fracture risk was measured using the REMS Fragility Score (FS). The clinical, biochemical profile and imaging (vertebral morphometry by X-ray of the thoracic or lumbar spine) were obtained and the results were recorded in a database. Data were analyzed using descriptive statistics and the nonparametric test (Mann–Whitney U test).
Results: We document a median age of 56.5 y and median time since transplantation of 81.5 months IQR (25.7–116.8). Some alteration in BMD in lumbar spine (LS), femoral neck (FN) and total hip (TH) was observed in 53.8% (n = 14) of which 34.6% (n = 9) had osteopenia and 19.2% (n = 5) osteoporosis, none with fragility fractures. In those under 50 y, they didn't have low bone mass according to the Z-score. In the osteoporotic population we found a median concentration of iPTH in 95 pg/mL IQR (55.9–171) and 25-hydroxyvitamin D levels in 22.5 ng/ml IQR (18.8–28.6). It wasn't alterations in serum level of calcium and phosphate.
Conclusion: An overall decrease in skeletal remodeling and bone turnover has been described after transplantation, with a cumulative dose of steroids directly related to slower bone turnover and mineralization. Regarding the differences between patients with normal BMD and patients with osteoporosis or osteopenia, statistical significance ($p < 0.05$) was found in diabetes mellitus ($p = 0.02$), high FS in LS ($p < 0.001$), and in TH ($p < 0.001$). REMS seems to detect a higher percentage of patients with osteoporosis although the sample size is low. Post-RTx-MBD and osteoporosis are common disorders in KTR, therefore, an effective diagnostic method helps avoid adverse outcomes such as fragility fractures. The REMS densitometry is effective in detecting patients with post-transplant osteoporosis, and FS estimates the risk of fragility fracture at 5 y.

P627
FOLLOW-UP IN TREATMENT, REFRACTURES, MORTALITY, AND DISABILITY BY A SECONDARY FRACTURE PREVENTION PROGRAM

A. Medina[1], S. Tabares[1], J. A. Fernández[1], M. A. Rueda[1], N. Camargo[1], A. L. Ely[1]

[1]Fundación Universitaria de Ciencias de la Salud (FUCS), Bogotá, Colombia

Objective: Supervise treatment and monitor falls, refractures, disability and mortality during a one-year follow-up in patients admitted to the Secondary Fracture Prevention Program of the San José Hospital in Bogotá Colombia since 2022.
Methods: A one-year telephonic follow-up study was carried out in patients with fragility fractures admitted to the Fracture Liaison Service (FLS) named Secondary Fracture Prevention Program at the Hospital San José in Bogota-Colombia between January 2022 and August 2023. Variables were analyzed at 3, 6 and 12 months after the fracture occurred according to Key Performance Indicator (KPI) established by the International Osteoporosis Foundation (IOF).
Results: A final sample of 118 patients with one year follow-up was obtained, 74.6% (n = 88) were women, and the median of age was 79 y. Regarding the fracture site: 66%, 13%, 8.4% and 7.6% were located in hip, vertebrae, radius and humerus, respectively. During the hospitalization, patients underwent laboratory tests, radiographs of the dorsolumbar spine and densitometry with REMS technology. During telephone follow-up, only 13% (n = 15) didn't respond to calls.
Conclusion: FLS are intended to prevent refracture through timely treatment and prevention of falls, but refractures follow-up are poorly studied. According to the KPIs used to assess the FLS performance, it was found that 87% (n = 103) of patients received indications to start osteoporotic management prior to hospital discharge of which 58% (n = 46) started the treatment in the first 4 months; 42% and 39% were under treatment at 6 and 12 months pos-fracture respectively. A fall was present in 2.5% and a new fracture in 1.7% of patients, 12% dead and disability was present in 45% during one-year follow up. The fracture follow-up is really difficult to carry out, because the patients treated at the hospital do not return to the controls but are directed by the health-system to other centers. This is a warning to health entities to become aware of the presence of refractures and death, which can be avoided with timely treatment for osteoporosis.

P628
CORTICAL BONE PARAMETERS DERIVED FROM PERIPHERAL QUANTITATIVE COMPUTED TOMOGRAPHY ARE LOWER IN PERIMENOPAUSAL COMPARED TO PREMENOPAUSAL WOMEN

K. L. Holloway-Kew[1], A. G. Morse[1], K. B. Anderson[1], J. W. Harland[1], M. A. Kotowicz[1], J. A. Pasco[1]

[1]Deakin Univ., Geelong, Australia

Objective: Postmenopausal BMD loss has been well described. There are fewer studies examining changes in other bone measures following the onset of menopause. This study aimed to examine differences between pre- and perimenopausal women using pQCT.

Methods: Women (n = 66) participating in the most recent follow-up phase of the Geelong Osteoporosis Study were included. Menopause data were self-reported. A pQCT instrument (XCT 2000, Stratec Medizintechnik, Pforzheim, Germany) was used to obtain standard transverse scans at 4% and 66% of radial and tibial length. BMD was measured using a GE-Prodigy densitometer. TBS iNsight software (Version 2.2) was used to obtain TBS values. Percentage differences comparing the perimenopausal (1–5 y since last menstrual period, n = 28) to the premenopausal group (n = 38) were calculated.
Results: Compared to the premenopausal group (median age 45.3 y, IQR 40.0–47.4 y), women in the perimenopausal (median age 53.5 y, IQR 50.0–57.7 y) group had lower femoral neck (− 5.8% 95% CI − 13.0%, − 0.3%), lumbar spine (− 11.0% 95% CI − 20.1%, − 4.9%) and ultra-distal forearm (− 10.9% 95% CI − 15.0%, − 2.5%) BMD, as well as TBS (− 8.5% 95% CI − 12.1%, − 1.9%). Cortical bone density was lower for the perimenopausal group compared to the premenopausal group at both the radius (4% site: − 11.0% 95% CI − 18.0%, − 5.9%; 66% site: − 2.8% 95% CI − 4.4%, − 1.5%) and tibia (4% site: − 3.6% 95% CI − 10.2%, − 1.1%; 66% site: − 2.3% 95% CI − 3.6%, − 0.3%). Total density was also lower at the radius (4% site: − 11.0% 95% CI − 17.5%, − 4.8%; 66% site: − 7.5% 95% CI − 10.7%, − 0.9%). Cortical area at the 66% tibial site (− 7.0% 95% CI − 12.0%, − 0.3%) and bone mineral content at the radial 4% site (− 10.0% 95% CI − 14.4%, − 2.2%) were also lower for perimenopausal women.
Conclusion: Differences in bone parameters, particularly reduced cortical bone, were observed between pre- and perimenopausal women.

P629
ALLOSTATIC LOAD AND TRABECULAR BONE SCORE IN MEN: DATA FROM THE GEELONG OSTEOPOROSIS STUDY

J. A. Pasco[1], K. B. Anderson[1], L. J. Williams[1], M. A. Kotowicz[1], B. Agustini[1], K. L. Holloway-Kew[1]

[1]Deakin Univ., Geelong, Australia

Objective: Allostatic load (AL) refers to 'wear and tear' on the body which accumulates following exposure to repeated or chronic stress. Research suggests that some mediators of AL also affect bone homeostasis. By utilising markers for cardiovascular, metabolic and inflammatory disturbances, we aimed to evaluate the association between AL and TBS in men.
Methods: Blood samples and anthropometry for 1007 men (median age 63 y, IQR 48–75) from the Geelong Osteoporosis Study were used to calculate the AL score whereby a value in the high-risk quartile of each of nine variables contributed one point to the overall score: resting systolic blood pressure and diastolic blood pressure, BMI, and fasting levels of serum glycosylated haemoglobin, C-reactive protein, IL-6, triglycerides, high-density lipoprotein and albumin. At follow-up, 571 men also provided TBS values at the lumbar spine (L1–4) using iNsight software (v2.2) 5 y later and were included in analyses. Linear regression models were used to evaluate the association between high AL (scores ≥ 4) and TBS, before and after adjusting for age.
Results: The proportion of men with high AL increased with age up to age-group 70–79 y: 20–29 y n = 0 (0%), 30–39 y n = 4 (6.9%), 40–49 y n = 8 (9.6%), 50–59 y n = 20 (18.4%), 60–69 y n = 20 (18.4%), 70–79 y n = 48 (41.0%) and 80 + y n = 15 (27.8%); $p < 0.001$. Mean (± SD) TBS was lower for 115/571 (20.1%) men with high AL (1.138 ± 0.143 v 1.222 ± 0.154; $p < 0.001$) which remained significant after adjusting for age (β − 0.04274, p = 0.005). Age was identified as an effect modifier; high AL was associated with low TBS for ages < 80y, with differences in TBS between those with and without high AL diminishing with advancing age.
Conclusion: High AL was associated with lower TBS at follow-up, at least in men < 80y. Further research is needed to determine if AL impacts the trajectory of deteriorating bone microarchitecture observed with fragility fractures.

P630
IMPORTANCE OF MEASURING STRENGTH AND WALKING TESTS IN ASSESSMENT IN RISK OF FALLING AND FRACTURES IN ELDERLY WOMEN

J. Aleksic[1], J. Zvekic-Svorcan[2]

[1]Railway Healthcare Institute, Belgrade, [2]Univ. of Novi Sad, Medical Faculty of Novi Sad, Special Hospital for Rheumatic Diseases, Novi Sad, Serbia

Objective: Osteoporosis is associated with falls and fractures. Due to muscle weakness, spine kyphosis, decreased postural control and low physical activity, women with osteoporosis have higher risk of falls[1]. We aimed to observe the differences in walking abilities and muscle strength among groups of fallers and non-fallers in elderly women.
Methods: In this cross-sectional study, data were collected related to the fracture. Strength and walking abilities were measured using time up and go (TUG) test. An older adult who cannot perform test within 14 s is at increased risk of falling.
Results: In this study, 440 women were included with 119 (24.8%) being over 64 years old. A far greater percentage of falls in the same level was registered among older participants (74.8 vs. 39.1%). In the group over 64 years old, 40.3% of them experienced a fracture due to minor trauma, while the percentage in the younger group is 15.5% ($\chi^2 = 36.218$; df = 1; p = 0.000). The TUG test can be performed by 81% of subjects. A statistically significant difference was found in the ability to perform the TUG test in relation to age ($\chi^2 = 72.44$; df = 1; p = 0.000). Women younger than 65 are able to perform this test in 94% of cases, while 64% of older participants. Among the women without fracture, 89.2% of them could perform this test, while in the subgroup with a fracture only 66.4% ($\chi^2 = 34.9$; df = 1; p = 0.000). Also, a smaller percentage of subjects with vertebral (35.6 vs. 64.4%), non-vertebral (16.5 vs. 83.5%) and both types of fractures at the same time (45.7 vs. 54.3%) are able to perform this test in the allotted time, in relation to test subjects who do not have these fractures ($\chi^2 = 24.6$; df = 2; p = 0.001). Subjects with a previous fracture of the forearm, upper arm and other fractures can perform this test in a fairly high percentage (76.8%, 64% and 70.9%), unlike subjects who had a hip fracture (41.9%)
Conclusion: Impaired walking abilities and muscle strength is associated with risk of fall among elderly women
Reference: (1) Aleksic J, et al. Menopause 2018;25:444

P631
INFLUENCE OF AGE ON SLEEP QUALITY OF PHYSIOTHERAPISTS: PILOT STUDY

M. Stanic[1], R. Krasnik[1], A. Mikov[1], J. Aleksic[2], J. Zvekic-Svorcan[3]

[1]Univ. of Novi Sad, Faculty of Medicine Novi Sad. Institute of Child and Youth Health Care of Vojvodina, Novi Sad, [2]Railway Healthcare Institute. Dept. of Physical Medicine and Rehabilitation, Belgrade, [3]Univ. of Novi Sad, Faculty of Medicine Novi Sad. Special Hospital for Rheumatic Diseases, Novi Sad, Serbia

Objective: To assess the effect of age on the quality of sleep of physiotherapists.

Methods: Prospective cross-section study encompassed 21 physiotherapists of both sexes, working at the Clinic for Physical Medicine and Rehabilitation of the Institute for Health Care of Children and Youth of Vojvodina, Novi Sad, Serbia. The study was approved by the Ethics Committee of the Institute (part. No.: 17/14-2023) and all subjects have signed the informative consent form. Data from a sociodemographic questionnaire (created by the examiner) and data from a sleep quality assessment questionnaire (Pittsburgh Sleep Quality Index-PSQI, validated for Serbian population) were used. This questionnaire consists of two parts: 19 self-assessed questions and 5 questions assessed by a bed partner. Questions are scored from 0 = no difficulty to 3 = severe difficulty. Scores range from 0 to 21 (a higher score indicates poorer sleep quality), and a score > 5 is considered a significant sleep disorder. Statistical processing and data analysis were done using SPSS v.23 software.
Results: In this research participated 21 respondents of both sexes, with an average age of 38.43 ± 11.28 y. Average body height was 170.24 ± 9.13 cm, and body weight was 74 ± 10.51 kg. The PSQI score values on average were 5.86 ± 2.61. Pearson's correlation coefficient determined that there is a statistically significant positive correlation between age and sleep quality of physiotherapists ($r = 0.474$, $p < 0.05$). The group of older respondents (over 40 y) had worse sleep quality, compared to the younger group of respondents (up to 40 y) (6.89 ± 2.57 vs. 5.08 ± 2.47), although this difference isn't statistically significant ($t = -1.629$, $p > 0.05$).
Conclusion: Sleep difficulties are associated with an increased incidence of cognitive and psychomotor function disorders and workplace injuries, which is significant for all individuals (especially healthcare workers), and the risk of these disorders increases with age. It's necessary to conduct further research on a larger sample to assess how other factors such as body height, body weight, gender, years of work experience have an impact on the quality of sleep, in order to find out how it can be improved.

P632
PREVALENCE OF OSTEOPOROTIC FRACTURES OF THE DISTAL FOREARM IN PEOPLE OF OLDER AGE GROUP

J. Averkieva[1], M. Koroleva[1], M. Letaeva[1], O. Malyshenko[1], T. Raskina[1]

[1]Kemerovo State Medical Univ., Kemerovo, Russia

Objective: To study the prevalence of osteoporotic fractures of the distal forearm in people of the older age group.
Methods: The prevalence of osteoporotic fractures of the distal forearm was assessed by the attendance of patients aged 50 years and older to trauma centers in Kemerovo. 446 fractures were recorded. Among women, fractures of this location occurred in 89.01% of cases (397 people), among men in 10.99% of cases (49 people) ($p < 0.0001$).
Results: The frequency of fractures of the distal forearm according to appeal was 286.75/100,000 of the population aged 50 years and older for both sexes: for men—84.62/100,000, for women—406.6/100,000 of the population. The analysis showed that the highest incidence of fractures of the distal forearm in women was registered at the age of 80 years and older and amounted to 680.6/100,000 person/y, the smallest number of fractures was noted at the age of 50–54 y: 94.7/100,000 person/y. years ($p < 0.05$). In the age group of 55–59 y, a statistically significant trend towards an increase in the number of fractures was revealed: 347.3/100,000 ($p < 0.01$). It was found that in women aged 60 years and older, no statistically significant differences between age groups were obtained ($p > 0.05$). In men, the majority of fractures of the distal forearm were registered in the age groups 70–74 y, 80 y and older: 234.1/100,000 and 278.7/100,000 person/y, respectively, the smallest number of fractures occurred in the age groups 50–54 y and was 17.2/100,000 person/y ($p < 0.05$). Starting from the age of 55–59 y, there was a statistically significant increase in the number of fractures in men: 79.3/100,000 person/y ($p < 0.05$).
Conclusion: It was found that in women the incidence of fractures of the distal forearm was statistically significantly higher than in men. The highest incidence of fractures was recorded at the age of 80 y and older in people of both sexes.

P633
X-LINKED HYPOPHOSPHATEMIA'S BURDEN OF MUSCULOSKELETAL ISSUES: A CROSS-SECTIONAL STUDY

H. Parente[1], T. Gill[2], M. Dudley[2], R. Keen[2], J. Bubbear[2]

[1]Rheumatology Dept., Unidade Local de Saúde do Alto Minho, Ponte de Lima, Portugal, [2]Metabolic Bone Disease Unit, Royal National Orthopedic hospital, London, UK

Objective: X-linked hypophosphatemia (XLH) is a rare condition presenting in childhood through rickets, bone deformities and dental issues. It progresses to adulthood, compounding many musculoskeletal complications. We aimed to investigate the burden of musculoskeletal features and orthopedic surgeries, in an XLH cohort at the Metabolic Bone Diseases of the Royal National Orthopedic Hospital.
Methods: Cross-sectional study among adult XLH patients (diagnosed through clinical and biochemical tests, or PHEX mutation). Data was retrospectively collected from electronic clinical records: age, sex, symptomatic osteoarthritis, enthesopathy, fractures, tertiary hyperparathyroidism, number and type of orthopedic procedures, and XLH medications. SPSS Statistics v29 was used for a descriptive analysis.
Results: Our sample had 52 patients (16 males), with a mean current age of 47.6 ($\pm$ 15.7) years old. All patients had at least one surgery or musculoskeletal diagnosis related to XLH; 76.9% of patients had at least 2 musculoskeletal complications. Soft tissue conditions were observed in 38.4%, most commonly rotator cuff tendinopathy/calcifications/bursitis and spine calcifications; enthesopathy was reported in 15.4%, most frequently at the trochanteric site; symptomatic osteoarthritis was present in 53.9%, mostly in the lower limbs. 51.9% of patients had at least one fracture, with a total of 66 fractures reported. Tertiary hyperparathyroidism was identified in 9.6%, implicating parathyroid surgery in 4 cases. 86.5% underwent at least one arthroscopy or surgery, compounding a total of 157 orthopedic surgeries, mostly femoral and tibial osteotomies. Steroid injections were used in 17.3%.
Conclusion: Soft tissue disorders, enthesopathies, osteoarthritis, and fractures manifest at a higher rate and progress more rapidly than in the general population, demanding earlier and more frequent need for orthopedic surgeries.

P634
EFFICACY OF HIGH INTENSITY LASER THERAPY VERSUS SHAM LASER IN SYMPTOMATIC KNEE OSTEOARTHRITIS: A DOUBLE-BLIND RANDOMIZED CONTROLLED TRIAL

J. Champaiboon[1], C. Laotammateep[2], T. Surarangsit[2], W. Likhitpithak[2], J. Boonhong[1]

[1]Dept. of Rehabilitation Medicine, Faculty of Medicine, Chulalongkorn Univ., [2]Dept. of Rehabilitation Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Objective: Osteoarthritis (OA) of the knee is a prevalent musculoskeletal condition associated with pain and functional impairment.

High intensity laser therapy (HILT) has been proposed as a potential intervention to alleviate symptoms in OA patients. This study aims to investigate the efficacy of a specific HILT protocol in reducing pain and improving function in individuals with mild to moderate symptomatic OA knee.

Methods: This study was a randomized, double-blinded controlled trial including 40 patients with mild to moderate symptomatic OA knee. The HILP group (n = 20) underwent HILT twice weekly for three weeks. The initial two sessions utilized the analgesic mode, administering a total energy of 600 J at the medial and lateral joint lines, followed by the subsequent 4 sessions using the biostimulation mode at the medial joint line with a total energy of 3000 J. The sham group (n = 20) received an identical protocol of sham laser therapy sessions. Both groups participated in a supervised home exercise program. Pain levels were assessed using the visual analog scale (VAS), and functional outcomes were measured using WOMAC and the timed up and go test (TUG). Evaluations were conducted before treatment and at 3 and 6 weeks after the initial treatment.

Results: Both groups demonstrated significant improvements in VAS and WOMAC. However, there were no significant differences in any of the measured outcomes between the two groups. Additionally, neither the HILT group nor the sham group demonstrated significant improvement in TUG.

Conclusion: Within the context of treating mild to moderate OA knee, the incorporation of a regimen involving twice weekly sessions of HILT—encompassing 2 sessions of analgesic and 4 sessions of biostimulation mode—alongside an exercise program did not demonstrate superior efficacy when compared to exercise alone.

P635
PRIOR ANTICOAGULATION IS NOT ASSOCIATED WITH WORSE OUTCOMES IN PATIENTS UNDERGOING SURGICAL MANAGEMENT OF HIP FRACTURES

A. M. López[1], J. D. Bernate[2], J. Rojas Lievano[2], C. M. Olarte[2], R. Pesantez[2], A. Patiño[1], V. Sanint[1], J. Salavarrieta[2], D. Morales[1]

[1]Geriatrics, [2]Orthopaedics, Hospital Universitario Fundación Santa Fe de Bogotá, Bogotá, Colombia

Objective: To evaluate the influence of preoperative anticoagulant therapy on postoperative outcomes, specifically transfusion requirement, ICU admission, and mortality rates in elderly patients undergoing hip fracture surgery.

Methods: A retrospective cohort of 638 hip fracture patients at our Orthogeriatric Clinical Care Center was analyzed. We used multivariate logistic regressions controlled for age, sex, BMI, Charlson Comorbidity Index, Barthel Index, and preoperative hemoglobin levels to assess the outcomes associated with preoperative anticoagulant use.

Results: Preoperative anticoagulation was not a significant predictor of postoperative transfusion, ICU admission, 30-d, or 1-y mortality (OR = 1.07, p = 0.758). The average time to surgery for patients who were not previously anticoagulated was 27.4 h vs. 42.5 h in the previously anticoagulated. The models accounted for a comprehensive set of clinical and demographic factors, ensuring robust adjustment for potential confounders.

Conclusion: The results demonstrate that despite the use of anticoagulant therapy prior to surgery in elderly patients treated for hip fractures, there was no increase in the risk of adverse postoperative outcomes and these demonstrate that in the clinical practice of preoperative anticoagulant management in this patient population it is possible to undergo timely surgery within the first 48 h after admission.

P636
DEPENDENCE OF FRAILTY ON NUMBER OF FALLS AND GAIT SPEED AMONG ELDERLY

J. Danilova[1], V. Ginevičienė[1], J. Kilaitė[1], R. Dadelienė[1], I. E. Jamontaitė[1], A. Mastavičiūtė[1], E. Pranckevičienė[1], I. I. Ahmetov[1], V. Alekna[1]

[1]Vilnius Univ., Vilnius, Lithuania

Objective: The highest frequency of falls among elderly is observed among those who are less active and have a slow walking speed. Walking speed is a reliable and sensitive measure of functional abilities, closely associated with the well-being, healthy aging, frailty, and mortality of older adults. Therefore, the aim of the study was to determine the dependency between falls and walking speed in relation to the frailty among elderly.

Methods: The study included 55 community dwelling older adults (mean age 77.98 ± 7.62 y): 12 (21.42%) men and 43 (78.58%) women. Measures included self-reported history of falls during one-year period, sociodemographic characteristics. Frailty was defined according to five Fried's criteria: weakness, low gait speed, low physical activity, weight loss, and exhaustion. Participants were categorized as robust, pre-frail, and frail if they scored 0, 1–2, and 3 points, respectively.

Results: According to frailty status 13 (23.6%) participants were evaluated as being robust, 25 (45.5%) having pre-frailty and 17 (30.9%) were frail. Falls were reported in 34 (61.8%) participants. Frailty and falls were found in 16 (29.1%) participants: 5 (31.25%) men and 11 (68.75%) women. Low gait speed were reported in 35 (63.6%) participants, frailty and low gait speed were found in 17 (30.9%) participants 5 (29.4%) men and 12 (70.6%) women. Among elderly individuals, the median of walking speed is 0.625 m/s, the results significantly ($p < 0.001$) differ from the median norms of older adults living in the community, as assessed by the Irish longitudinal study on aging (TILDA) to be 1.17–1.27 m/s. Correlation analysis showed a significant negative relationship between frailty and gait speed (m/s) ($r = -0.541$; $p < 0.001$) and significant positive correlation between frailty and falls ($r = 0.58$; $p < 0.001$). Logistic regression revealed that an increased risk of frailty was associated with falls and increased gait speed (OR: 1.21 (38.36–0.04) and OR: 0.24 (7.49–0.01)).

Conclusion: Our study showed that frailty depends on the number of falls experienced per year and the average walking speed.

Acknowledgement: This project has received funding from the Research Council of Lithuania (LMTLT), agreement No S-MIP-22-36.

P637
SHORT VERSUS LONG-TERM PREDICTION MODELS IN THE SELECTION FOR TREATMENT OF PATIENTS AT HIGH RISK OF FRACTURE: DATA FROM THE BELGIAN FRISBEE COHORT

J. De Filette[1], L. Iconaru[1], A. Charles[2], A. Bellanger[2], F. Baleanu[1], M. Moreau[3], M. Surquin[4], F. Benoit[4], J. J. Body[1], P. Bergmann[5]

[1]Dept. of Endocrinology, CHU Brugmann, Université Libre de Bruxelles, [2]Laboratoire de Recherche Translationnelle, CHU Brugmann, Université Libre de Bruxelles, [3]Data Centre, Inst. J. Bordet, Université Libre de Bruxelles, [4]Dept. of Internal Medicine, CHU Brugmann, Université Libre de Bruxelles, [5]Dept. of Nuclear Medicine, CHU Brugmann, Université Libre de Bruxelles, Brussels, Belgium

Objective: To analyze how patients with a recent fracture would be selected for pharmacological treatment using long-term (FRAX®

uncorrected or corrected for recency) vs. short-term prediction models (FRISBEE imminent model for MOFs).
Methods: We identified subjects in the FRISBEE cohort who sustained an incident MOF after inclusion (mean age 76.5 ± 6.8 y). We calculated their estimated 10-y fracture risk with FRAX before and after adjustment for recency and the 2-y fracture risk with the FRISBEE MOFs model.
Results: After 6.8 y of follow-up, we validated 480 incident and 54 imminent MOFs. 94.0% of the subjects who had an imminent fracture had a fracture risk estimated > 20% by FRAX before correction for recency and 98.1% after adjustment, with a specificity of 20.2% and 5.9%, respectively. The sensitivity and specificity of the FRISBEE imminent model were 72.2% and 55.4%, respectively, for a threshold of 10%. For these thresholds, 47.3% of patients were identified as high risk in both models before correction and 17.2% of them had an imminent MOF. The adjustment for recency did not change this selection. Before the correction, 34.2% of patients were selected for treatment by FRAX only and 18.8% would have had an imminent MOF. This percentage increased to 47% after the adjustment for recency, but only 6% of these would suffer a MOF within 2 y.
Conclusion: In the FRISBEE cohort, the imminent model was less sensitive but more selective in the selection of subjects in whom an imminent fracture should be prevented, resulting in a lower NNT, which could lower treatment costs. Correction for recency in this elderly population further decreased the selectivity of FRAX. Our result demonstrate the benefits of using the prediction model for imminent fractures in the selection of subjects at very high fracture risk, who are most in need of immediate treatment with high potency and rapid effect on fracture risk reduction, but are more expensive and require rigorous patient selection.

P638
CORRECTION FOR RECENCY OF 5-YEAR FRACTURE RISK ESTIMATED BY FRAX® IN THE FRISBEE COHORT

J. De Filette[1], L. Iconaru[1], A. Charles[2], A. Bellanger[2], F. Baleanu[1], M. Moreau[3], M. Surquin[4], F. Benoit[4], J. J. Body[1], P. Bergmann[5]

[1]Dept. of Endocrinology, CHU Brugmann, Université Libre de Bruxelles, [2]Laboratoire de Recherche Translationnelle, CHU Brugmann, Université Libre de Bruxelles, [3]Data Centre, Inst. J. Bordet, Université Libre de Bruxelles, [4]Dept. of Internal Medicine, CHU Brugmann, Université Libre de Bruxelles, [5]Dept. of Nuclear Medicine, CHU Brugmann, Université Libre de Bruxelles, Brussels, Belgium

Objective: Prediction models, especially FRAX, are widely used to estimate fracture risk at 10 y, but the current algorithm does not account yet for time elapsed after a fracture. Kanis et al. recently proposed correction factors to adjust the FRAX score for fracture recency. The objective of this work was to analyze the effect of fracture recency in the FRISBEE cohort and to compare to FRAX estimations.
Methods: We identified subjects in the FRISBEE cohort who sustained a validated fracture during the first 5 y after an incident MOF. We calculated their estimated 5-y fracture risk with FRAX, either uncorrected or corrected for recency and further adjusted for the MOF/hip ratios calibration factors previously derived for the Belgian FRAX. We compared the fracture risk estimated by FRAX before and after these corrections with the observed incidence of validated fractures in our cohort.
Results: In our cohort, 376 subjects had a first non-traumatic incident validated MOF after inclusion; 81 of them had a secondary fracture during the 5-y period after this index fracture. The FRAX score significantly under-evaluated the observed incidence of fractures in our cohort by 54.7% (fracture rate of 9.7%; 95% CI 6.8–12.9%) if uncorrected ($p < 0.001$) and by 32.6% after correction for recency (14.5%; 95% CI 11.1–18.2%) ($p = 0.01$). Calibration for MOF/hip ratios also improved the prediction (17.5%; 95% CI 13.7–21.4%) ($p = 0.2$). However, after adjustment for recency and calibration, the predicted value was over-estimated by 22% (fracture rate of 26.1%; 95% CI 21.6–30.5%) but this over-estimation was not significant ($p = 0.1$).
Conclusion: Our data indicate that the correction of the FRAX score for fracture recency improves fracture prediction. However, correction for recency and calibration for MOF/hip ratios tends to overestimate fracture risk in our population of elderly women.

P639
ONE-YEAR MORTALITY RATE AFTER PROXIMAL FEMUR FRACTURE IN A BRAZILIAN QUATERNARY UNIVERSITY HOSPITAL INSTITUTE

J. Dias[1], F. F. Sanches[1], K. A. A. Medeiros[1], M. M. Arouca[1], K. E. Kojima[1], M. C. Leonhardt[1], J. S. Silva[1], O. P. Camargo[1], M. U. Rezende[1]

[1]Departamento de Ortopedia e Traumatologia do Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil

Objective: To document mortality in the first year of patients hospitalized at IOT/HCFMUSP, due to osteoporotic fracture of the proximal femur and evaluate whether personal characteristics influence this mortality.
Methods: Retrospective observational study, with patients admitted to the IOT due to osteoporotic proximal femur fracture, between 07/01/2020 and 06/30/2021, correlating with personal data of age, gender, laterality, previous diagnosis of osteoporosis, type of proximal femur fracture, American Society of Anesthesiology (ASA) score and Charlson Comorbidity Index (CCI).
Results: Of the 156 hospitalized patients, 64 (43%) had mortality within 1 y. Age, ASA score and CCI influenced patients' mortality in the first year ($p < 0.05$), however, after adjusting the variables, only the ASA score and CCI influenced the patients' outcome independently of the other characteristics ($p = 0.024$ and $p = 0.002$ respectively). For every 1° increase in the ASA score, there is a 139% increase in the chance of mortality in the 1st year. Mortality with ASA III score was 52.1% and ASA IV was 100%. For every 1-point increase in the CCI there is a 36% increase in the chance of mortality in the 1st year. The area under the ROC curve was 0.749. The average CCI for patients who survived was 4.5 ± 2.2 and of those who died in the first year was 6.6 ± 2.3. The best CCI cutoff point of 5.5 was established to discriminate mortality within 1 year, with sensitivity of 65.6% and specificity of 72.9%.
Conclusion: The mortality of patients with osteoporotic proximal femoral fractures at this quaternary institute was higher than that described in the literature (43%), with the ASA score and CCI influencing mortality. Mortality at ASA IV score was 100%. There is a greater probability of death in the first year in patients with CCI ≥ 6.

P640
GENICULAR NERVES ABLATION BOTH BY PULSATED RADIOFREQUENCY AND PHENOL IMPROVE SEVERE KNEE OSTEOARTHRITIS SYMPTOMS AND FUNCTION AT ONE-YEAR

J. Dias[1], M. Freitas[1], M. M. Arouca[1], G. P. Ocampos[1], M. U. Rezende[1], O. P. Camargo[1]

[1]Departamento de Ortopedia e Traumatologia do Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil

Objective: To document the effects of genicular nerves ablation in patients with severe knee osteoarthritis (KOA).
Methods: Prospective, randomized, controlled trial comparing 35 patients with grade IV Kelgren & Lawrence (Alhback grade III and IV) submitted to ablation of genicular nerves with pulsed radiofrequency (RF) or phenol. Clinical outcomes were evaluated at baseline, 1, 3, 6 and 12 months VAS and KOOS, 30 s sit to stand test (30STS) and timed up and go (TUG).
Results: Groups were similar at inclusion (Table 1). Both groups improved similarly in all moments up to a year ($p < 0.001$, Table 2). VAS decreased on average 30% from baseline to all subsequent evaluations ($p < 0.05$). TUG decreased only between baseline and one month post-procedure ($p = 0.001$) and 30STS increased on average from baseline to one, three and 12 months ($p < 0.05$).

Table 1 – Baseline characteristics and evaluations.

Variable	Group		Total (N = 35)	p
	RF (N = 17)	Phenol (N = 18)		
Age (years)				0.430
mean ± SD	63.9 ± 8.8	61.3 ± 10	62.6 ± 9.4	
median (p25; p75)	66 (58; 69.5)	60 (53; 69.3)	65 (56; 69)	
Sex, n (%)				0.603*
Female	16 (94.1)	15 (83.3)	31 (88.6)	
Male	1 (5.9)	3 (16.7)	4 (11.4)	
IMC (Kg/m²)				0.527
mean ± SD	35.3 ± 6.6	33.9 ± 7	34.6 ± 6.7	
median (p25; p75)	34,4 (32.2; 39)	32,5 (30.5; 35.9)	33.4 (31.3; 38.2)	
Side, n (%)				0.404#
Right	8 (47.1)	11 (61.1)	19 (54.3)	
Left	9 (52.9)	7 (38.9)	16 (45.7)	
VAS				0.253
mean ± SD	9.4 ± 0,8	9.1 ± 1	9.2 ± 0,9	
median (p25; p75)	10 (9; 10)	9 (8; 10)	10 (8; 10)	
TUG				0.949
mean ± SD	17.5 ± 9.3	17.3 ± 8.2	17.4 ± 8.6	
median (p25; p75)	14 (11.8; 17.4)	14.3 (11.6; 18.7)	14.3 (11.8; 17.2)	
TLS30S				0.343*
mean ± SD	7 ± 2.3	6.3 ± 1.9	6.6 ± 2.1	
median (p25; p75)	7 (5; 9)	6 (5; 8)	7 (5; 8)	
KOOS General				0.769
mean ± SD	25.8 ± 17	24.3 ± 12.5	25 ± 14,6	
median (p25; p75)	24 (10.5; 41)	27 (10; 35)	26 (10; 37)	
KOOS Simptoms+Stifness				0.318£
mean ± SD	38.7 ± 26.7	29.8 ± 13.1	34.1 ± 21	
median (p25; p75)	50 (9; 61)	32 (20.3; 40.8)	32 (14; 54)	
KOOS pain				0.684£
mean ± SD	24.9 ± 16.3	27.4 ± 16.6	26.2 ± 16.2	
median (p25; p75)	28 (8; 40.5)	34.5 (7.5; 39.8)	33 (8; 39)	
KOOS Daily Activities				0.935£
mean ± SD	29.1 ± 20.8	29 ± 17.7	29.1 ± 19	
median (p25; p75)	28 (11; 47)	33.5 (11.5; 41.8)	32 (12; 44)	
KOOS Sports				0.613£
mean ± SD	6.8 ± 9.2	4.2 ± 5.8	5.4 ± 7.6	
median (p25; p75)	0 (0; 10)	0 (0; 6.3)	0 (0; 10)	
KOOS Quality of life				0.351£
mean ± SD	13.4 ± 10.6	10.6 ± 12.8	11.9 ± 11.7	
median (p25; p75)	13 (0; 22)	6 (0; 13.5)	13 (0; 19)	

Unpaired Student's t-test; # Chi-square test; * Fisher exact test; £ Mann-Whitney

Table 2- Pain, stiffness, function and quality of life.

Variable	Moment				P Group	P Moment	P Interaction
	Baseline	1 month	3 months	6 months 12 months			
VAS					0.323	**<0.001**	0.662
RF							
mean ± SD	9.4 ± 0.8	6.6 ± 2.2	6.9 ± 3.1	6.5 ± 3.4 6.7 ± 3.2			
median (p25; p75)	10 (9; 10)	7 (5; 8)	7 (5; 10)	ʼ.5 (3.5; 10 7.5 (4; 9.8)			
Phenol							
mean ± SD	9.1 ± 1	6.1 ± 3.3	5.7 ± 2.8	5.8 ± 3.1 7.2 ± 2.6			
median (p25; p75)	9 (8; 10)	6.5 (3.8; 9)	6 (4.3; 7.3)	5.5 (4; 8) 8 (4.8; 10)			
Total							
mean ± SD	9.2 ± 0.9	6.4 ± 2.8	6.2 ± 3	6.1 ± 3.2 7 ± 2.9			
median (p25; p75)	10 (8; 10)	6.5 (5; 8.3)	7 (5; 9)	6.5 (4; 9) 8 (4; 10)			
TUG					0.293	**<0.001**	0.211
RF							
mean ± SD	17.5 ± 9.3	14.7 ± 5.6	15.4 ± 13.3	17.9 ± 13 14.4 ± 5.7			
median (p25; p75)	14 (11.8; 17.4)	14 (11.5; 15.9)	12.4 (9.7; 16.7)	.1 (10.5; 16.4 (9.7; 16.9)			
Phenol							
mean ± SD	17.3 ± 8.2	13.3 ± 5.1	12.5 ± 4.1	13.1 ± 3.3 13 ± 3.6			
median (p25; p75)	14.3 (11.6; 18.7)	10.9 (9.6; 16.9)	10.6 (9.4; 15.5)	.2 (10.6; 15.7 (10.2; 15.7)			
Total							
mean ± SD	17.4 ± 8.6	13.9 ± 5.3	13.9 ± 9.5	15.4 ± 9.5 13.7 ± 4.7			
median (p25; p75)	14.3 (11.8; 17.2)	12.8 (10.3; 16)	11.9 (9.4; 15.9)	.5 (10.7; 15.7 (10.2; 15.8)			
30SST					0.537	**<0.001**	0.135
RF							
mean ± SD	7 ± 2.3	8.6 ± 2.3	8.9 ± 2.9	8.6 ± 3.6 8.4 ± 3.1			
median (p25; p75)	7 (5; 9)	8 (7; 9.8)	8.5 (6; 11)	).(6.5; 10.5 8 (8.3; 10)			
Phenol							
mean ± SD	6.3 ± 1.9	7.5 ± 2.6	8.7 ± 1.8	7.7 ± 2.6 8.9 ± 2.3			
median (p25; p75)	6 (5; 8)	7 (6; 9.3)	8 (7; 10)	7 (5.8; 9.3)).5 (7; 10.8)			
Total							
mean ± SD	6.6 ± 2.1	8 ± 2.4	8.8 ± 2.4	8.1 ± 3.1 8.7 ± 2.7			
median (p25; p75)	7 (5; 8)	8 (6; 9.3)	8 (7; 10)	7.5 (6; 10) 8 (7; 10)			
KOOS General					0.406	**<0.001**	0.528
RF							
mean ± SD	25.8 ± 17	39.9 ± 20.2	41.6 ± 18.1	42.2 ± 19.5 43 ± 21.4			
median (p25; p75)	24 (10.5; 41)	35 (27; 59)	43.5 (29.3; 53.5)	).5 (29; 60.((22.5; 65.8)			
Phenol							
mean ± SD	24.3 ± 12.5	41.6 ± 19.8	48.8 ± 20.6	48.9 ± 20.445.3 ± 23.3			
median (p25; p75)	27 (10; 35)	42 (30; 52)	45 (33.8; 67.3)	3 (2..8; 70.2 (22.5; 65.5)			
Total							
mean ± SD	25 ± 14.6	40.8 ± 19.7	45.7 ± 19.6	45.8 ± 19.944.2 ± 22.1			
median (p25; p75)	26 (10; 37)	39 (27.5; 52)	43.5 (32.3; 60.3)	).8.5 (30; 62 (22.5; 65.5)			
KOOS Simtomas+Rigidez*					0.962	**<0.001**	0.541
RF							
mean ± SD	38.7 ± 26.7	54.4 ± 27.6	54.6 ± 22.7	55.1 ± 22.555.4 ± 27.4			
median (p25; p75)	50 (9; 61)	53.5 (33; 75)	54 (44.3; 73)	ʼ (37.3; 65.).5 (40; 79.3)			
Phenol							
mean ± SD	29.8 ± 13.1	54.9 ± 22.5	61.3 ± 23.9	59.1 ± 22.557.1 ± 26.7			
median (p25; p75)	32 (20.3; 40.8)	61 (39.5; 68)	61 (44.3; 86.8)	).5 (40.8; 7) (30.3; 79.8)			
Total							
mean ± SD	34.1 ± 21	54.7 ± 24.7	58.4 ± 23.2	57.3 ± 22.256.3 ± 26.6			
median (p25; p75)	32 (14; 54)	57 (36; 71.5)	54 (46; 79)	57 (39; 73)ʼ (37.3; 79.8)			
KOOS pain*					0.348	**<0.001**	0.663
RF							
mean ± SD	24.9 ± 16.3	43.9 ± 24.1	46.1 ± 21.2	47.5 ± 23.347.3 ± 26.6			
median (p25; p75)	28 (8; 40.5)	44 (26; 62.5)	45.5 (31; 64)	).1 (33; 64.8.5 (28; 68.5)			
Phenol							
mean ± SD	27.4 ± 16.6	44.9 ± 21.4	55.4 ± 24.6	55 ± 23.9 52.4 ± 28.4			
median (p25; p75)	34.5 (7.5; 39.8)	47 (32; 57)	52.5 (37.5; 74.3)	).5 (33; 77.) (27.3; 82.3)			
Total							
mean ± SD	26.2 ± 16.2	44.4 ± 22.4	51.3 ± 23.3	51.5 ± 23.5 50 ± 27.3			
median (p25; p75)	33 (8; 39)	45.5 (31.8; 58)	47 (34.5; 66.3)	58 (33; 75).8.5 (28; 81)			
KOOS Daily activities*					0.533	**0.002**	0.571
RF							
mean ± SD	29.1 ± 20.8	44.6 ± 20..8	47.4 ± 21.7	48.9 ± 25.348.1 ± 23.9			
median (p25; p75)	28 (11; 47)	35 (30.5; 61.5)	48 (32.8; 59.3)	) (28.5; 72.-7 (24; 74.3)			
Phenol							
mean ± SD	29 ± 17.7	43.7 ± 25.9	54.6 ± 24	58.1 ± 24.848.9 ± 25.9			
median (p25; p75)	33.5 (11.5; 41.8)	38 (29.5; 65.5)	45 (38; 80.5)	.5 (31.8; 7852 (27; 69)			
Total							
mean ± SD	29.1 ± 19	44.2 ± 23.1	51.4 ± 23	53.8 ± 25 48.5 ± 24.6			
median (p25; p75)	32 (12; 44)	37.5 (31.3; 60.8)	46.5 (37.3; 67.5)	ʼ (32.5; 75.).5 (24; 72.8)			
KOOS Sports*					0.919	**0.03**	0.863
RF							
mean ± SD	6.8 ± 9.2	15.6 ± 20	14.6 ± 13.2	10.4 ± 15.412.8 ± 14.3			
median (p25; p75)	0 (0; 10)	5 (0; 25)	12.5 (3.8; 21.3)	5 (0; 16.3) 10 (0; 25)			
Phenol							
mean ± SD	4.2 ± 5.8	18.5 ± 21.7	19.4 ± 14.7	10.3 ± 12.313.6 ± 16.7			
median (p25; p75)	0 (0; 6.3)	15 (0; 27.5)	22.5 (3.8; 30)	10 (0; 17.5)10 (0; 16.3)			
Total							
mean ± SD	5.4 ± 7.6	17.1 ± 20.6	17,3 ± 14,1	10.3 ± 13.613.2 ± 15.4			
median (p25; p75)	0 (0; 10)	10 (0; 25)	15 (5; 30)	5 (0; 16.3)10 (0; 21.3)			
KOOS Quality of life*					0.556	**0.003**	0.739
RF							
mean ± SD	13.4 ± 10.6	18.5 ± 16	19.3 ± 12.8	20.6 ± 20.827.8 ± 18.4			
median (p25; p75)	13 (0; 22)	13 (6; 31)	19 (11.3; 25)	19 (0; 25) 28 (13; 38)			
Phenol							
mean ± SD	10.6 ± 12.8	19.4 ± 20.5	26.1 ± 20	26.9 ± 20.733.1 ± 20.4			
median (p25; p75)	6 (0; 13.5)	19 (3; 31)	25 (15.8; 32.8)	19 (7.8; 43)4.5 (13; 50)			
Total							
mean ± SD	11.9 ± 11.7	18.9 ± 18.1	23.1 ± 17.3	24 ± 20.7 30.6 ± 19.4			
median (p25; p75)	13 (0; 19)	16 (6; 31)	19 (14.5; 31)	19 (6; 38.5)1 (13; 45.5)			

Conclusion: Ablation of genicular nerves in patients with severe KOA, may provide long lasting improvements in pain, function, and quality of life.

P641
THE EFFECT OF ROMOSOZUMAB ON BONE MINERAL DENSITY DEPENDING ON PRIOR TREATMENT: A PROSPECTIVE, MULTICENTRE COHORT STUDY IN SWITZERLAND

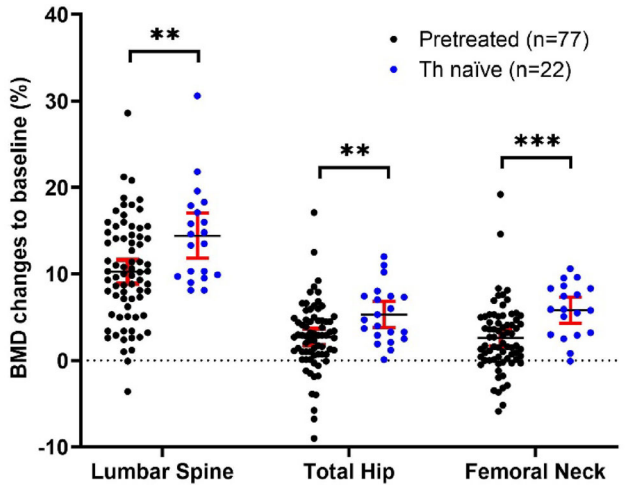
J. Everts-Graber[1], M. Wenger[2], S. Oser[2], U. Studer[3], C. Steiner[3], R. Ziswiler[3], K. Sromek[4], G. Schmid[4], B. Gahl[5], S. Reichenbach[1], T. Lehmann[3]

[1]Univ. Hospital of Bern, Dept. of Rheumatology and Immunology, Bern, [2]Zentrum für Rheuma- und Knochenerkrankungen, Klinik Im Park, Hirslanden Zürich, Zürich, [3]OsteoRheuma Bern, Bern, [4]Dept. of Rheumatology, Lucerne Regional Hospital, Lucerne, [5]Surgical Outcome Research Center, Dept. of Clinical Research, Univ. Hospital Basel and Univ. of Basel, Basel, Switzerland

Objective: In Switzerland, romosozumab is administered to high-risk osteoporosis patients. Our study aimed to assess the effect of romosozumab on BMD, considering prior therapies.
Methods: This multicentre, prospective cohort study measured the effect of romosozumab for 12 months in patients in a nationwide

Swiss osteoporosis registry. BMD and bone turnover marker (P1NP and CTX) changes were measured and compared between patients with prior antiresorptive therapy vs. treatment-naïve patients.

Results: 99 patients (92 women and 7 men, median age 71 y [65, 76]) were enrolled from January 2021 to December 2023. Among them, 22 had no prior treatment before romosozumab, while 77 had previous therapy (including 23 with a history of prior teriparatide therapy), accumulating 6 y [4, 11] of cumulative antiresorptive treatment. Over 12 months, romosozumab led to BMD changes of 10.3% [7.5, 15.5] at the lumbar spine, 3.1% [1.1, 5.8] at the total hip, and 3.1% [0.5, 5.4] at the femoral neck, exhibiting notable variability. Significantly lower BMD responses were observed in pre-treated patients, with the duration of prior antiresorptive therapy inversely associated with BMD increases at the lumbar spine and hip. Other predictors of BMD changes at the total hip included baseline lumbar spine and total hip T-scores, BMI and baseline CTX level, while the BMD response at the lumbar spine was associated with age, baseline lumbar spine T-score and baseline CTX level, but not P1NP levels.



Conclusion: Prior antiresorptive therapy blunted the BMD response to romosozumab, with the duration correlating with changes at both the lumbar spine and total hip.

P642
FRACTURE DISTRIBUTION IN PATIENTS WITH OR WITHOUT RHEUMATOID ARTHRITIS OR USE OF GLUCOCORTICOIDS: ANY INDICATIONS OF METHOTREXATE OSTEOPATHY?

E. Bührer[1], A. Popp[2], U. Studer[3], R. Ziswiler[3], C. Steiner[3], G. Schmid[4], S. Reichenbach[1], T. Lehmann[3], J. Everts-Graber[1]

[1]Univ. Hospital of Bern, Dept. of Rheumatology and Immunology, Bern, [2]Inselspital Univ. Hospital Bern, Dept. of Diabetes, Endocrinology, Nutritional Medicine and Metabolism, Bern, [3]OsteoRheuma Bern, Bern, Switzerland, [4]Dept. of Rheumatology, Lucerne Regional Hospital, Lucerne, Switzerland

Objective: Case series have suggested a potential association between the use of low-dose methotrexate and an elevated risk of stress fractures in the lower leg and foot. This study aimed to analyse the distribution and frequency of fractures in individuals with a potential history of methotrexate use in comparison to those without such history.

Methods: The distribution and frequency of non-vertebral fractures were investigated in patients with a documented history of rheumatoid arthritis and/or the use of glucocorticoids, encompassing those undergoing low-dose methotrexate therapy. This analysis was conducted using data from a nationwide osteoporosis registry of rheumatologists in Switzerland.

Results: Out of the 23,802 registered patients enrolled between January 2015 and December 2023, 2117 were identified with a history of rheumatoid arthritis and/or glucocorticoid use. Within this cohort, 812 non-vertebral fractures were documented, with 224 (28%) involving the lower leg or foot (tibia, fibula, ankle, calcaneus, tarsus, or metatarsalia). In comparison, the total osteoporosis population documented 2958 lower leg or foot fractures (27%), with no statistically significant difference observed (p = 0.97). The incidence of multiple lower leg and foot fractures did not significantly differ between patients with rheumatoid arthritis/use of glucocorticoids (n = 76, 34%) and the entire osteoporosis population in the registry (n = 954, 32%, p = 0.60).

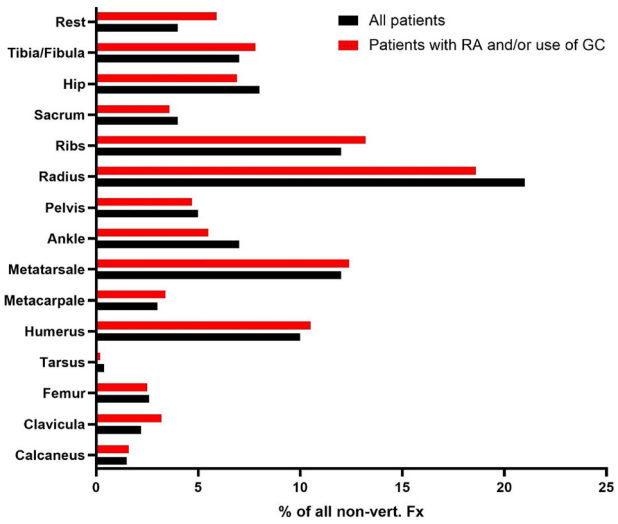


Figure 1. Percentage of non-vertebral fractures in patients with RA and/or use of glucocorticoids (GC) (red, n=2'117) vs. all patients in the osteoporosis registry (black, n=23'802).

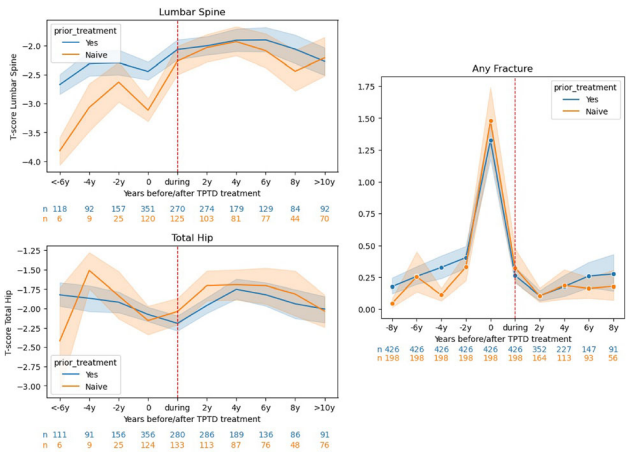
Conclusion: Single and multiple stress fractures of the lower leg and foot were observed in equal proportions in patients, regardless of whether they were using methotrexate or not. These findings suggest that there is no specific association between the occurrence of these fractures and the use of methotrexate.

P643
LONG-TERM IMPACT OF TERIPARATIDE ON BONE MINERAL DENSITY, TRABECULAR BONE SCORE AND FRACTURE INCIDENCE OVER A DECADE: INSIGHTS FROM A REGISTRY-BASED COHORT STUDY

J. Everts-Graber[1], O. Lehmann[2], M. Wenger[3], S. Oser[3], L. Guyer[4], U. Studer[5], C. Steiner[5], R. Ziswiler[5], G. Schmid[6], S. Reichenbach[1], T. Lehmann[5]

[1]Univ. Hospital of Bern, Dept. of Rheumatology and Immunology, Bern, [2]ETH Zürich, Dept. of Information Technology and Electrical Engineering, Zürich, [3]Zentrum für Rheuma- und Knochenerkrankungen, Klinik Im Park, Hirslanden Zürich, Zürich, [4]Faculty of Medicine, Univ. of Bern, Bern, [5]OsteoRheuma Bern, Bern, [6]Dept. of Rheumatology, Lucerne Regional Hospital, Lucerne, Switzerland

Objective: The fracture reduction efficacy of teriparatide followed by subsequent antiresorptive therapy has been observed for up to 2 y. However, the critical question remains whether the sequential administration of anabolic agents followed by antiresorptives can lead to a sustained increase in BMD and TBS levels, ultimately resulting in a consistently low fracture risk.
Methods: In this multicentre cohort study, the effect of teriparatide administration for 18–24 months, followed by antiresorptive therapy, was assessed among patients enrolled in a nationwide Swiss osteoporosis registry. BMD and TBS measurements, along with fracture incidence, were documented up to 10 y before the initiation of teriparatide and up to 10 y after. Subgroup analysis was conducted to compare outcomes between patients receiving first-line and second-line teriparatide.
Results: A total of 624 patients (87% female, age 67 ± 13 years) were enrolled from May 2004 to December 2023. Among them, 198 (32%) had no prior treatment before teriparatide, while 426 had received previous antiresorptive therapies (mean duration of 5.9 y [2.2, 8.0]). All patients underwent subsequent antiresorptive therapy, mainly bisphosphonates and denosumab. The incidence of vertebral, hip, and any fractures was 0.96, 0.11, and 1.37, respectively, 2 y or less before teriparatide initiation, and these rates rapidly declined during the treatment period. After transitioning from teriparatide to antiresorptive regimens, fracture incidences remained low and never returned to pre-teriparatide levels. Consequently, BMD was significantly higher up to 5 y after teriparatide compared to the pre-treatment period (T-score + 0.876 for lumbar spine, $p < 0.001$, and + 0.112 for total hip, $p < 0.005$), and TBS increased by 0.047 ($p < 0.001$). Overall, significant improvement was observed in patients who received teriparatide as either a first-line or second-line treatment.



Conclusion: Teriparatide, whether used as a first-line or second-line therapy, resulted in sustained lower incidences of vertebral, hip, and any fractures up to 10 y after transitioning to antiresorptive agents. Additionally, BMD and TBS levels were significantly higher than those observed before teriparatide treatment.

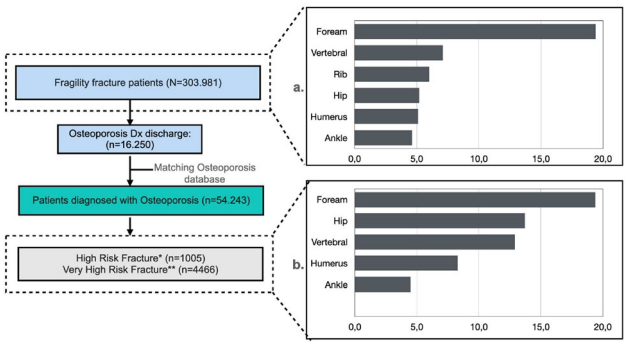
P644
OSTEOPOROSIS CARE GAPS IN COLOMBIA: HIGH RISK AND REFRACTURE RATES

J. F. Betancur[1], L. E. Perez[1], J. E. Bolaños[1], V. Bernal[1]

[1]Unidad de Investigacion SURA, Medellin, Colombia

Objective: To examine the prevalence of osteoporosis and refracture rates as imminent risks among high- and very high-risk patients in Colombia, highlighting the inadequacies in current healthcare management.

Methods: This nationwide retrospective cohort study analyzed medical records of individuals over 50 who sustained fragility fractures between 2003–2022. Clinical and demographic characteristics at the time of the initial fracture were analyzed, as well as the subsequent imminent risk (refracture rate) and the diagnosis and treatment gap.
Results: Over nearly two decades, 303,982 fragility fractures have occurred, and only 5.3% of patients were diagnosed with osteoporosis upon discharge. The most prevalent index fractures were forearm, vertebral, rib, and hip. Only 17.8% of the cohort had a matched osteoporosis diagnosis, indicating a low healthcare capture (Figure). Among the diagnosed patients, 10.08% were classified as high- and very high-risk of fracture, predominantly women with a mean age of 73 y. Comorbidities included diabetes, Sjögren's syndrome, and heart failure. The prevalence of osteoporosis has increased significantly from 2004 to 2022, possibly due to improved detection methods, an aging population, or a combination of both. Despite this increase, treatment delay was evident. Refractures affected 70.5% of the patients, with forearm, hip, humerus, and vertebral fractures being the most common, with a mean time of refracture of 7 months.



Conclusion: This study underscores significant gaps in the timely management of osteoporosis in Colombia, with most fragility fracture patients needing more prompt diagnosis and treatment. These findings suggest an urgent need for improved healthcare protocols and national policies to enhance osteoporosis care and reduce the incidence of subsequent fractures.

P645 Characterization of the role of IL-6 and IL-8 in osteoblasts with normal or low bone density in vitro

J. F. Bousch[1], C. Beyersdorf[1], K. Schultz[1], J. Windolf[1], C. V. Suschek[1], U. Maus[1]

[1]Univ. Hospital of Düsseldorf, Düsseldorf, Germany

Objective: In this study, we characterized the role of the proinflammatory cytokines IL-6 and IL-8 by evaluating their impact on the osteogenic differentiation potential of osteoblasts from patients with normal bone density and osteoporosis and by analyzing the expression patterns of IL-6 and IL-8 during differentiation in vitro.
Methods: Primary osteoblasts were isolated from the femoral heads of patients undergoing hip arthroplasty due to osteoarthritis and fracture. Based on DXA, the cells were classified as normal bone density (OB; $T > -1.0$) or osteoporotic (oOB; $T < -2.5$). In cell culture, the cells were differentiated in osteogenesis induction medium (OIM) for 35 days and in the presence and absence of IL-6 and IL-8 for 21 d. Protein expression was analyzed by ELISA and mineralization was quantified by alizarin red S staining.
Results: For IL-8, we observed a lower secretion in oOB than in OB. The secretion started at day 14 of differentiation and reached its maximum at day 35 in OB (1947 pg/ml) and at day 28 in oOB (1360 pg/ml). IL-6 was already secreted in undifferentiated cells with no

difference between OB and oOB. Interestingly, however, both cytokines had a more increasing effect on mineralization in oOB with an even significant difference in response to IL-6 compared to OB. Observing the mineralization over time, the process was similar for oOB and OB over 28 d of differentiation, but significantly decreased for oOB at day 35.

Conclusion: Since in vivo IL-8 correlates with low bone density, the lower IL-8 secretion in oOB shown in this study may be an adaptive response to the inflammatory milieu in osteoporotic patients. However, the increased mineralization in response to IL-8 and IL-6, which was even greater in oOB than in OB, may be a compensatory response. Further work should address the effect of inflammation on the activity of primary human osteoclasts and their interaction with osteoblasts.

P646
2-YEAR OUTCOMES OF A FRACTURE LIAISON SERVICE: ASSESSMENT OF MORTALITY, REFRACTURE RATE AND READMISSION RATE

D. Augusto[1], S. P. Dinis[1], F. Cunha-Santos[1], A. S. Pinto[1], N. Madeira[1], L. Matos[1], I. Campos[1], P. Rocha[1], G. Monteiro[1], I. Neves[1], C. Pontinha[1], A. R. Batista[1], S. Venâncio[1], G. Cunha[1], S. C. Anunciação[1], E. Pires Alves[1], C. Vaz[1], J. F. Ferreira[1]

[1]Serviço de Reumatologia da Unidade Local de Saúde da Guarda, Guarda, Portugal

Objective: To assess the 2-y refracture, readmission and mortality outcomes and prevalence of treatment modalities of patients followed in our Fracture Liaison Service (FLS) after a fragility hip fracture (FHF).

Methods: We registered sociodemographic, types of FHF, treatment type, refractures, readmissions and deaths data that happened until the 2-y follow up mark. Descriptive and comparative analysis was made using the means, T-tests, chi-square and Mann-Whitney U tests. Logistic regression was performed to assess predictors of refracture.

Results: Of the 147 patients referred, 126 went to the first appointment, of which 84.1% were female. The mean age was 77.27 $\pm$ 8.6 y. 46.8%, 34.9% and 5.6% of the patients had respectively femoral neck, intertrochanteric and subtrochanteric fracture. 12.7% of fractures were atypical. Regarding treatment type, 69.9%, 26.0% and 1.6% of patients were treated with denosumab, a bisphosphonate or teriparatide, respectively. 2.4% were not medicated. 2.4% of patients died (n = 3), 5.6% were readmitted to a hospital ward (n = 7) and 11.9% of patients had a refracture (n = 15). Patients with previous fragility fractures (PFF) had more refractures than the group without previous fractures (p = 0.047). When testing in logistic regression, PFF were predictors of refractures: p = 0.044; R^2 = 0.033. Odds ratio for PFF was 3.125 (95% CI 1.033–9.452). No differences were found in refracture rate between treatment modalities (p = 0.244).

Conclusion: Our population had a 2.4% mortality rate, performing better than the mortality seen overall. Patients with PFF were 3.125 times more likely to have a refracture. This work shows previous fragility fractures may be a predictor of refracture in patients with FHF, hence the importance of preventing them from happening in the first place. All treatments appeared similar in refracture risk.

P647
MAPPING TREATMENT PATHS: A DECISION TREE ANALYSIS OF FACTORS INFLUENCING OSTEOPOROSIS TREATMENT PRESCRIPTIONS

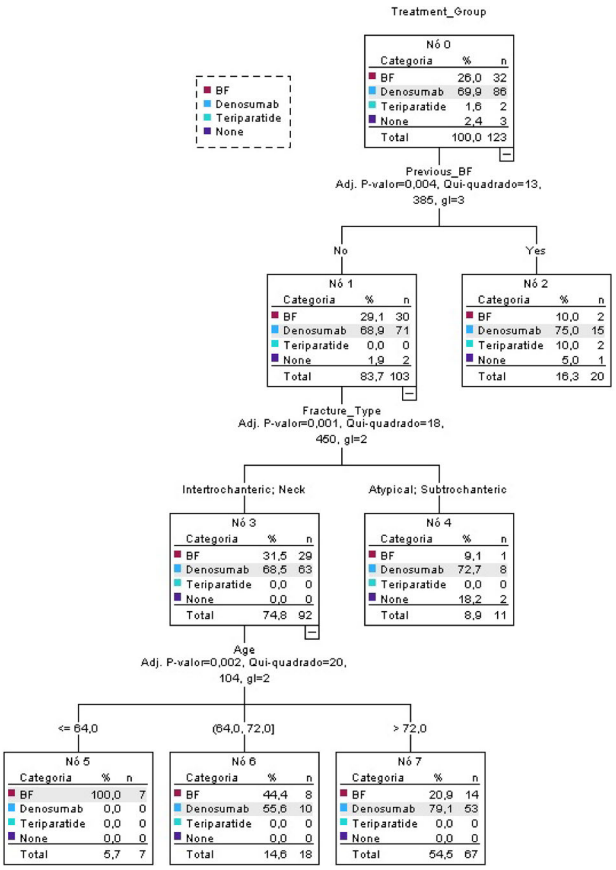
D. Augusto[1], S. P. Dinis[1], F. Cunha-Santos[1], A. S. Pinto[1], N. Madeira[1], L. Matos[1], I. Campos[1], P. Rocha[1], G. Monteiro[1], I. Neves[1], C. Pontinha[1], A. R. Batista[1], S. Venâncio[1], G. Cunha[1], S. C. Anunciação[1], E. Pires Alves[1], C. Vaz[1], J. F. Ferreira[1]

[1]Serviço de Reumatologia da Unidade Local de Saúde da Guarda, Guarda, Portugal

Objective: To analyze determinants impacting osteoporosis treatment decisions in patients from our Fracture Liaison Service (FLS) following fragility hip fractures (FHF).

Methods: Retrospective analysis using the decision tree algorithm in SPSS®, examining sociodemographic and clinical data.

Results: 69.9%, 26.0% and 1.6% of patients were treated with denosumab (Dmab), a bisphosphonate (BF) and teriparatide (TPTD), respectively. 2.4% were not medicated. The first major split was determined by the presence or absence of prior BF treatment. Patients were further stratified based on the type of fracture and age categories, forming the decision hierarchy of the decision tree. For patients without prior BF treatment (83.7% of the cohort), Dmab (68.9%) and BF (29.1%) prescription was common and TPTD was never used. In those with prior BF treatment, Dmab (75.0%) prescription was followed by TPTD (10.0%), with a frank reduction in the prescription of BF (10.0%). In the subgroup without prior BF treatment, patients with intertrochanteric and femur neck fractures, 68.5% were treated with Dmab and 31.5% with BF. Further stratification by age within this subgroup showed that among those aged < 64, 100% received BF. In the 64–72 age group 55.6% received Dmab and 44.4% received BF. In the > 72 age group, the majority (79.1%) were treated with Dmab. For atypical and subtrochanteric fractures within the no previous BF treatment subgroup, Dmab was the prevalent choice (72.7%), while a smaller proportion received BF (9.1%). 18.2% of these patients in this subgroup were not treated with any osteoporosis treatment.



Conclusion: Dmab prescription followed international guidelines, favored in older patients with higher risk of fracture. Younger patients universally received BF. A conservative approach was observed for some atypical fractures.

P648
OBSTACLES IN COMMENCING OSTEOPOROSIS TREATMENT AMONG FRAGILITY FRACTURE PATIENTS AT A TERTIARY HOSPITAL IN MALAYSIA

J. F. Leong[1], N. A. Shohor[1], S. Jeyakumar[1], S. A. Mokhtar[1]

[1]Fracture Liaison Service, Orthopaedic and Traumatology Dept., Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia

Objective: Osteoporosis is a skeletal disease that severely affects the mechanical properties of bones. It increases the porosity of cancellous bone and reduces the resistance to fractures. Osteoporotic fracture remains a significant health and economic burden in Malaysia. Several treatments for osteoporosis, including bisphosphonates (alendronate, ibandronate, risedronate, and zoledronic acid) and non-bisphosphonates (denosumab, raloxifene, teriparatide, and romosozumab), have been approved in Malaysia. Despite the availability of multiple treatment options, the clinical management of osteoporosis has remained challenging throughout the years.
Methods: This is a prospective study throughout the year 2022. Patients > 55 years old with fragility fractures were identified and reviewed in a university teaching hospital by Fracture Liaison Service (FLS) coordinators. A total of 282 osteoporotic patients with fragility fractures were identified. The patients were counselled about anti-osteoporotic medications.
Results: Among the 282 patients, 76% were keen on anti-osteoporotic medications after being counselled by FLS coordinators. A total of 67 (24%) patients with fragility fractures did not initiate anti-osteoporosis medication. The primary reasons for not initiating osteoporosis medication were financial issues (59%), patient's decisions (29%), physician's decisions (8%), concern of side effects (2%), and those with too many medications (2%).
Conclusion: Among those who are diagnosed with osteoporosis and refuse anti-osteoporosis therapy, financial issues are the most common reason for not initiating therapy. Awareness and too many medications due to old age also played an important role in negligence towards osteoporosis. The likelihood and type of side effects were also ranked as important factors in making the decision to use the recommended medications. The results of this study show that barriers to osteoporosis therapy include medication cost, undertreatment of osteoporosis, and the concern of side effects. The percentage of elderly patients willing to take anti-osteoporotic medications has increased significantly compared to the last two years after they were being counselled by FLS coordinators. More commitment is needed to introduce the FLS not only in tertiary hospitals but also in primary care centres to raise awareness about osteoporosis and its treatment.

P649
ADHERENCE TO ANTI-OSTEOPOROSIS MEDICATION, CALCIUM, AND VITAMIN D SUPPLEMENTATION AT THE 6-MONTH AND 1-YEAR MARKS

J. F. Leong[1], S. Jeyakumar[1], N. A. Shohor[1], M. K. Yin[2], S. A. Mokhtar[1]

[1]Fracture Liaison Service, Orthopaedic and Traumatology Dept., [2]Pharmacological Dept., Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia

Objective: Osteoporosis is a condition characterised by excessive bone loss and significant public health issues in elderly men and women. Adherence to medication for osteoporosis patients has become a challenge since those medications are required for the long term. Similar to other chronic diseases such as hypertension and diabetes, osteoporosis has struggled with suboptimal medication adherence, resulting in more fractures and all-cause mortality in elderly people.
Methods: From January 2021 to June 2021, patients initiating osteoporosis treatment were systematically monitored by the Fracture Liaison Service (FLS) over a 1-y period. Compliance with medication was evaluated after 6 months and 1 y post-treatment initiation.
Conclusion: A cohort of 76 patients was identified and managed by the FLS. Initially, 76% of patients exhibited compliance with anti-osteoporotic medication at the 6-month mark, which decreased to 68% after 1 y. Notably, individuals receiving denosumab (85%) demonstrated superior compliance compared to those prescribed bisphosphonates (74%) at the 1-y follow-up. Various factors contributing to reduced compliance were identified, including financial constraints, transportation challenges, and instances where patients discontinued treatment for reasons unknown. Enhancing compliance with anti-osteoporosis regimens necessitates the implementation of effective pharmacological management strategies. Collaborative efforts among healthcare professionals and interdisciplinary teams can significantly benefit osteoporosis patients. The integration of FLS emerges as a crucial initiative for facilitating early intervention and ensuring treatment adherence among osteoporosis patients.

P650
A CASE REPORT OF ATYPICAL FEMUR FRACTURES SECONDARY TO NON-TYPICAL ETIOLOGIES IN A MALAYSIAN TERTIARY HOSPITAL

J. F. Leong[1], N. A. Shohor[1], S. Jeyakumar[1], S. A. Mokhtar[1]

[1]Fracture Liaison Service, Orthopaedic and Traumatology Dept., Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia

Atypical femur fractures (AFFs) typically result from prolonged bisphosphonate therapy and are characterised by distinct radiographic features. However, AFFs can also occur due to other underlying conditions or factors, presenting diagnostic dilemmas for clinicians. We present a case of AFFs with atypical aetiologies encountered at a Malaysian tertiary hospital, shedding light on the diagnostic approach and management strategies in such scenarios.
Case report: A 72-year-old male presented to our hospital with complaints of Left hip pain following a fall. Radiographic evaluation revealed fractures consistent with AFFs in the left proximal femur prompting further investigation into potential causative factors. Prior to the fall, the patient relied on a walking frame for mobility. He complained of persistent throbbing pain in the left proximal thigh that had persisted for 2 weeks. Notably, he had been on Omeprazole for few years and had been using MDI Beclomethasone since 2013 for his bronchial asthma. Subsequently, the patient underwent left proximal femur nailing with good post-operative outcome.

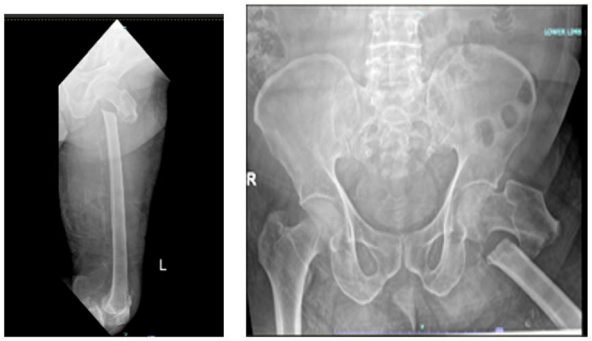


Figure shows atypical fracture of proximal left femur

Discussion: This case challenges the conventional understanding of AFFs solely linked to bisphosphonate therapy and underscores the necessity of a comprehensive diagnostic workup to elucidate alternative etiologies. Use of Proton Pump Inhibitor may decrease bone strength and increase the incidence of insufficiency fractures by inhibiting proton pumps in osteoclasts and decreasing bone turnover, impairing calcium absorption, and altering homocysteine levels through impairment of folate and vitamin B12 absorption. Prolonged use of glucocorticoid can increase bone resorption and reduce bone formation. Combination of these 2 medications can increase risk of AFF.
Conclusion: This case report highlights the importance of considering non-typical aetiologies in the diagnosis and management of atypical femur fractures. Clinicians should maintain a high index of suspicion for alternative causative factors, especially in regions with unique patient demographics and healthcare paradigms. Further research is warranted to elucidate the spectrum of etiologies contributing to AFFs and optimise treatment approaches for affected individuals.

P651
ENHANCEMENT IN BONE MINERAL DENSITY FOLLOWING TWO YEARS OF ADHERENCE TO ANTI-OSTEOPOROSIS MEDICATION, CALCIUM, AND VITAMIN D SUPPLEMENTATION

J. F. Leong[1], N. A. Shohor[1], S. Jeyakumar[1], S. A. Mokhtar[1]

[1]Fracture Liaison Service, Orthopaedic and Traumatology Dept., Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia

Objective: The initial assessment of BMD serves as a pivotal step in diagnosing osteoporosis and determining the necessity of treatment. Subsequent monitoring of BMD is essential for patients undergoing treatment or transitioning from medication. This study aims to elucidate the efficacy of BMD monitoring in individuals receiving anti-osteoporotic therapy.
Methods: Seventy-one patients aged 55 years and older, admitted to the orthopaedic wards at Hospital Universiti Kebangsaan Malaysia due to osteoporotic or low-trauma fractures, were identified by the Fracture Liaison Service (FLS) for inclusion. Exclusion criteria included patients with malignancies, while those admitted for other reasons must have lacked a history of osteoporotic or low-trauma fractures. Patient demographics, including age, gender, race, comorbidities, and medication history, were documented.
Results: Prior to compliance with anti-osteoporotic medications, responders exhibited a significant increase in BMD. After two years of anti-osteoporotic therapy, both lumbar and hip BMD showed significant improvement. Specifically, the study demonstrated a 4% to 6% increase in spinal bone density and a 3% to 5% increase in hip bone density.
Conclusion: The majority of patients demonstrate a notable increase in BMD with treatment. Clinical trials indicate that less than 2% of treated patients experience a significant decrease in BMD. Non-compliance with medication, particularly within the first 6 months of therapy, is the primary cause of decreased BMD among patients. The FLS plays a crucial role in assisting multidisciplinary teams in identifying, diagnosing, and treating elderly patients at high risk of osteoporosis.

P652
PERIOPERATIVE FACTORS INFLUENCING FUNCTIONAL OUTCOMES 1-YEAR AFTER FRAGILITY HIP FRACTURE SURGERY

S. Dinis[1], A. S. Pinto[1], F. Cunha Santos[1], D. Augusto[1], H. Ferreira-Cardoso[2], L. Matos[3], I. Campos[3], P. Rocha[4], G. Monteiro[4], I. Neves[4], C. Pontinha[4], A. R. Batista[4], S. Venâncio[4], G. Cunha[4], E. Alves[4], N. Madeira[1], C. Vaz[1], J. Ferreira[1]

[1]Rheumatology Dept., Unidade Local de Saúde da Guarda, Guarda, [2]Dept. of Physical Medicine and Rehabilitation, Centro Hospitalar Universitário de São João, Porto, [3]Nutrition Dept., Unidade Local de Saúde da Guarda, Guarda, [4]Dept. of Orthopedics and Rehabilitation, Unidade Local de Saúde da Guarda, Guarda, Portugal

Objective: To determine the factors that influence functional outcomes of patients surgically treated for fragility hip fractures.
Methods: Retrospective study, including fragility hip fracture patients postoperatively followed-up at our Fracture Liaison Service between September 2019 and January 2023. Demographic and clinical characteristics were evaluated. Functional outcome was assessed using Barthel Index (BI) and 30-s chair to stand test (30CST) at discharge and at 12 months postoperatively. Inferential analysis was divided in 2 approaches: the first, measuring the difference between "at 12-month" and "at discharge" for both BI and 30CST, to evaluate functional recovery. The second approach divided the patients in 2 groups at 12-months postoperatively: those who had achieved a full recovery (maximum BI = 100) and those who had not (BI < 100). Mann Whitney and Chi-Square tests were used, and Pearson correlation coefficient was calculated. The significance level was < 0.05.
Results: A total of 78 patients were enrolled (69 female), with a median [interquartile range (IQR)] age of 78 [11] y. The median [IQR] "at discharge" BI score was 60 [7.5]. In the first analysis, we found no statistically significant differences in postoperatively functional recovery according to gender, BMI, previous fractures, fracture type, surgical technique, time until surgery, BMD and serum vitamin D. In the second approach, when considering the patients who had achieved a maximum BI score of 100 (76.9%) and those who had not (23.1%), a significant age difference was found ($p = 0.003$). In fact, the group that achieved a BI = 100 (75,23 y, CI95% [73,29–77,18]) was significantly younger than the group that did not (81,22 y, CI95% [77,49–84,96]). No other significant differences were observed.
Conclusion: Our results revealed that increased age negatively influenced autonomy recovery in fragility hip fractures. All patients improved their autonomy to perform activities of daily living, with 76.9% achieving a maximum BI score at 12-month follow-up. Some limitations of our study are the small sample size and the inability to evaluate the pre-fracture functional status, one of the best-known determinant factors of functional outcomes.

P653
THE BURDEN OF DIABETES IN AN FLS

F. Falcão[1], D. Augusto[2], S. Paiva Dinis[2], A. Amorim[1], F. Cunha Santos[2], A. S. Pinto[2], N. Madeira[2], L. Matos[3], I. Campos[3], P. Rocha[4], G. Monteiro[4], I. Neves[4], C. Pontinha[4], A. R. Batista[4], S. Venâncio[4], G. Cunha[4], E. Pires Alves[2], C. Vaz[5], J. Fonseca Ferreira[5]

[1]Faculty of Health Science, Univ. of Beira Interior, Covilhã, [2]Rheumatology Dept., Local Health Unity of Guarda, Guarda, [3]Nutrition Dept., Local Health Unit of Guarda, Guarda, [4]Rehabilitation Nurse Team, Orthopedics Dept., Local Health Unit of Guarda, Guarda, [5]Rheumatology Dept., Local Health Unity of Guarda and Faculty of Health Sciences at the Univ. of Beira Interior, Guarda, Portugal

Objective: To Determine, in a real word FLS (Fracture Liaison Service), the prevalence of type 1 and type 2 diabetes mellitus, and the number of antidiabetic drugs taken by patients with hip osteoporotic fractures, since a consensus established that the presence of diabetes mellitus is associated with a greater risk of developing osteoporosis.
Methods: All patients enrolled in our FLS after a fragility hip fracture, from October 2019 until October 2023, were systematically questioned about sociodemographic, clinical, densitometric, clinical and pharmacologic data. We establish two groups, one with diabetes and the other without diabetes. Descriptive and comparative analysis used the means, T-tests, chi-square, and Mann–Whitney U tests. p-value $< 0,05$ was considered significant.
Results: Out of the 147 patients who were referred, 126 o attended at least one appointment. Among them, 84.1% were female. The mean age of the patients was 77.3 ± 8.6 y. Type 2 diabetes was present in 21.7% of the patients, while there was no case of type 1 diabetes in this group. In the FLS 18% were taking oral antidiabetic drugs (14.3% metformin, 7.1% DPP-4 inhibitors, 3.9% SGLT2 inhibitors, 1.6% Sulfonylurea, and 0.8% were taking both GLP-1 analogs and thiazolidinediones), and 7% were treated with insulin. We found a significant association between diabetes and hypertension in our cohort (p 0.020), but no other association was significant.
Conclusion: This study is unique as it assesses the occurrence of diabetes in an FLS whereas most studies focus on the prevalence of osteoporosis in patients with diabetes. Our findings revealed that roughly 20% of patients with hip fractures had diabetes mellitus, and we observed a correlation with other cardiovascular factors, such as hypertension. This highlights the importance of preventing cardiovascular risk factors in FLS.

P654
DO WE REALLY NEED CALCIUM AND VITAMIN D TABLETS?

C. Amorim[1], D. Augusto[2], S. Paiva Dinis[2], F. Falcão[1], F. Cunha Santos[2], A. S. Pinto[2], L. Matos[3], I. Campos[3], P. Rocha[4], G. Monteiro[4], N. Madeira[2], I. Neves[4], C. Pontinha[4], A. R. Batista[4], S. Venâncio[4], G. Cunha[4], E. Pires Alves[2], C. Vaz[5], J. Fonseca Ferreira[5]

[1]Faculty of Health Science, Univ. of Beira Interior, Covilhã, [2]Rheumatology Dept., Local Health Unity of Guarda, Guarda, [3]Nutrition Dept., Local Health Unit of Guarda, Guarda, [4]Rehabilitation Nurse Team, Orthopedics Dept., Local Health Unit of Guarda, Guarda, [5]Rheumatology Dept., Local Health Unity of Guarda and Faculty of Health Sciences at the Univ. of Beira Interior, Guarda, Portugal

Objective: To compare the effects of calcium and vitamin D supplements on analytical and functional outcomes in a prospective FLS cohort.
Methods: Data was collected from October 2019 to October 2023 on consecutive patients who were enrolled in our FLS program following a hip fracture. We recorded various data including sociodemographic, clinical, densitometric, and pharmacologic details at baseline and after 12 months. Additionally, we recorded the timed-up-and-go test, sit-to-stand test, and 0-m walk test at baseline, 6 months, and 12 months. Patients were divided into 2 groups: group 1 received either calcium and vitamin D supplements or only vitamin D supplements, while group 2 did not receive any supplements. We used descriptive and comparative analysis, including means, T-tests, Mann–Whitney U, and chi-square tests as appropriate. A p-value < 0.05 was considered significant.
Results: Out of 147 referred patients, 126 attended at least one appointment. Among them, 84.1% were female, and the mean age was 77.3 ± 8.6 y. We found that 73.3% of patients had a prescription for calcium and/or vitamin D, while 26.8% did not take any supplements. We compared the outcomes of both groups and found no significant differences in analytical or functional results without calcium and vitamin D supplementation.
Conclusion: Our research findings imply that the intake of calcium and vitamin D supplements did not have a significant effect on functional or analytical responses in this study. However, it is important to note that we did not monitor dietary calcium uptake, such as the completion of daily calcium requirements, the reasons for declining supplements, or the reasons for not being prescribed, which could have influenced the results. Additionally, we did not investigate refracture rates, which could have been impacted by the use of calcium and vitamin supplementation. Therefore, although it seems that consuming calcium and vitamin D tablets may not be necessary, further research is required to fully understand this topic.

P655
RISK FACTORS FOR SUBSEQUENT FRACTURES AFTER DISTAL RADIUS FRACTURE

J. H. Ahn[1], E. J. Lim[2], S. H. Lee[1], J. K. Kim[1], H. J. Kim[1], Y. H. Shin[1]

[1]Dept. of Orthopedic Surgery, Asan Medical Center, Univ. of Ulsan College of Medicine, Seoul, [2]Dept. of Orthopaedic Surgery, Chungbuk National Univ. Hospital, Chungbuk National Univ. College of Medicine, Cheongju, South Korea

Objective: To evaluate the risk factors for subsequent fractures after distal radius fracture (DRF).
Methods: We retrospectively reviewed 705 patients with DRF who performed DXA within 6 months before or after the DRF and followed for more than 12 months. We identified patients with subsequent fractures and multivariate logistic regression analyses were conducted with demographic information, underlying disease status, and bone fragility parameters at the time of DRF to evaluate the risk factors for subsequent fractures.
Results: Subsequent fractures occurred in 56 patients (7.9% of 705 patients) with 65 fractures at a mean time of 33.5 months after DRF. In multivariate logistic regression analysis, older age (OR 1.032; 95%CI, 1.001–1.064, p = 0.044), diabetes mellitus (DM) (OR 2.663; 95%CI, 1.429–4.963, p = 0.002) and previous fracture history (OR 1.917; 95%CI, 1.019–3.607, p = 0.043), and low total hip BMD (OR 1.410; 95%CI, 1.083–1.836, p = 0.011) were significant risk factors for the occurrence of subsequent fractures.
Conclusion: This study demonstrated that older age, DM, previous fracture history, and low hip BMD are the risk factors for subsequent fractures after DRF. Active glycemic control would have a role in patients with DM and a more aggressive treat-to-target approach may be necessary for patients with low BMDs to prevent subsequent fractures after DRF.

P656
PATIENT-REPORTED OUTCOMES AFTER OPEN REDUCTION INTERNAL FIXATION FOR DISTAL RADIUS FRACTURE IN MEN

J. H. Ahn[1], J. K. Kim[1], B. H. Oh[1], Y. H. Shin[1]

[1]Dept. of Orthopedic Surgery, Asan Medical Center, Univ. of Ulsan College of Medicine, Seoul, South Korea

Objective: Most of the previous clinical studies on distal radius fractures (DRF) have primarily focused on women, particularly those beyond peri-menopausal ages, due to the demographic characteristics of DRF patients. This study aims to assess patient-reported outcomes

following open reduction and internal fixation (ORIF) for DRF in men, as well as the factors influencing these outcomes.
Methods: We conducted a retrospective review of the medical records and radiographs of 109 men who underwent ORIF for DRF from September 2016 to January 2022, with a follow-up period exceeding 2 y. The assessment included the visual analogue scale for pain, grip strength, range of motion of both wrists, Disabilities of the Arm, Shoulder, and Hand (DASH), and Patient-Rated Wrist Evaluation (PRWE) questionnaires at postoperative 3 months, 1 y, and annually thereafter.
Results: In a multivariate linear regression model estimating postoperative 1-y DASH scores, older age (B 0.201; 95%CI 0.042 to 0.361; p = 0.014) and worker's compensation (B 13.348; 95%CI 4.530 to 22.165; p = 0.003) were significantly associated with higher DASH scores. The same analysis for postoperative 1-y PRWE scores showed that only worker's compensation (B 5.417; 95%CI 2.646 to 24.122; p = 0.015) was significantly associated with higher PRWE scores. In a multivariate linear regression model estimating final follow-up PRWE scores, only AO/OTA type C (B 7.201; 95%CI 0.396 to 14.007; p = 0.038) was significantly associated.
Conclusion: Older age and worker's compensation are significantly associated with poor patient-reported outcomes after ORIF for DRF in men up to the postoperative 1-y. Careful evaluation of these patients is essential to determine whether this poor outcome is related to secondary gain from worker's compensation and age-related normal functional decline. After more than 2 y post-operation, only the initial fracture severity was significantly associated with poor patient-reported outcomes.

P657
WHAT FACTORS DETERMINE MEN'S SELF-PERCEIVED RISK OF OSTEOPOROSIS? FINDINGS FROM THE HERTFORDSHIRE INTERGENERATIONAL STUDY

J. Hammond[1], K. Mcgill[1], I. Bloom[1], E. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, Southampton, UK

Objective: While awareness of osteoporosis might be considered reasonable in women, far fewer research studies consider male osteoporosis and few educational materials target men. Despite this, demographic changes mean that osteoporotic fractures are likely to become much more common in both sexes. The primary aim of this qualitative study was to explore men's understanding of factors associated with risk of osteoporosis.
Methods: Nine male participants aged 55–68 y were recruited from the Hertfordshire Cohort intergenerational study. Men were interviewed by Teams or phone using semi structured interviews, recordings were transcribed and thematically analysed. Self-completed questionnaires regarding past medical history and lifestyle were available, to guide discussion.
Results: Several key themes were identified including personal and family history of fracture, participants reported seeing the consequence of a parental hip fracture in later life, and recognized age as important. Participants spoke commonly about the importance of physical activity and maintenance of a healthy body weight for good health generally, rather than in relation to bone health. Diet was often mentioned, and several participants spoke about the importance of dairy products, calcium tablets and vitamin D supplementation. In some cases, this reflected awareness that their wife took supplements for bone health. Four respondents discussed the relevance of cigarette smoking and heavy alcohol consumption to bone health, and medical history (specifically use of steroids) was recognized as important by several respondents. Several participants reported that they thought fractures were always related to high trauma and so 'being careful' would protect them.
Conclusion: Overall, it appeared that many men who participated had some knowledge of bone health and spoke frequently of their desire to make lifestyle change to improve their health generally. However, some men reported no awareness, and described it as 'a women's disease'. Although our sample likely reflected a healthy cohort effect, with greater health awareness than might be present in the wider population, heavy alcohol consumption and cigarette smoking as risk factors were named as important by a minority of respondents, suggesting that this may be an area to target when considering educational materials aimed at men.

P658
IMPACT OF PROTON PUMP INHIBITORS ON FEMORAL NECK OSTEOPOROSIS

J. Hankollari[1], V. Duraj[2]

[1]Albanian Univ., [2]Univ. Hospital Center "Mother Teresa", Tiranë, Albania

Objective: Proton pump inhibitors (PPIs) are used to treat several clinical conditions like: esophagitis, gastritis, duodenitis, symptomatic GERD, gastric and duodenal ulcers, Zollinger-Ellison syndrome, etc. Many studies have shown that proton pump inhibitors have a negative impact on femoral neck osteoporosis. We aim to study this hypothesis in our population.
Methods: We opted to conduct a retrospective study, in which 120 patients were enrolled. We compared the change in T-score values in the femoral part between patients who received PPIs treatment for a duration exceeding one year and those who did not receive this treatment. We selected female patients, postmenopausal, who did not take other medications and did not have other accompanying diseases or only pathologies where the use of PPIs is indicated.
Results: After analyzing the data, it was observed that patients who were treated with PPIs, about 59% of the cases, had a smaller improvement in T-score values compared to patients who did not receive such treatment, with a p-value of < 0.05, which is statistically significant.
Conclusion: PPIs have a negative impact on femoral neck osteoporosis.

P659
ROLE OF SUMOYLATED SIRT1 IN THE PATHOLOGICAL DEVELOPMENT OF INTERVERTEBRAL DISC DEGENERATION BY REGULATING NUCLEUS PULPOSUS CELL SENESCENCE

T. Y. Teng[1], J. J. M. Jianjun[1]

[1]Zhejiang Univ., Hangzhou, China

Objective: Low back pain is a prevalent clinical symptom of musculoskeletal degenerative disease. The primary cause of low back pain is intervertebral disc degeneration (IDD). However, the regulatory mechanism of post-translational modification (PTM) of silent mating type information regulation 2 homolog 1 (SIRT1) during IDD remains unclear. Our study reveals that SUMO modification of SIRT1 plays a crucial role in the process of IDD.
Methods: SiRNA and lentiviral plasmid were used to knock down and overexpress SIRT1 in nucleus pulposus cells (NPCs), respectively. Subsequently, we detected the expression levels of synthetic and catabolic factors to verify the function of SIRT1 in NPCs. Professional websites were utilized to predict potential SUMO modification sites in SIRT1, which were further confirmed through

point mutations experiments. Immunoprecipitation and co-immunoprecipitation techniques were used to validate the effect of nicotinamide adenine dinucleotide (NAD +)-dependent deacetylase activity on p53 acetylation after SUMO modification by SIRT1. Additionally, we studied the impact of SIRT1 on IDD using both SIRT1 knockout mice and acupuncture modeling.

Results: Our findings demonstrate that there is a significant decrease in SIRT1 expression within degraded intervertebral disc tissues; however, overexpression can increase extracellular matrix production while reducing decomposition factors. Similar results were observed in gene knockout mice models as well. Mechanistically, our research indicates that SUMO modification can occur at K113, K132, K439 residues within SIRT1 protein sequence leading to improved stability for this protein variant. Consequently, enhanced stability promotes deacetylation process targeting p53 protein resulting in its accelerated degradation along with inhibition cell senescence.

Results: Our findings demonstrate a significant decrease in SIRT1 expression within degraded intervertebral disc tissues. However, we observed that overexpression of SIRT1 led to an increase in extracellular matrix production and a decrease in decomposition factors. These results were further validated through gene knockout experiments conducted on mice. Mechanistically, we identified SUMO modification sites at K113, K132, and K439 of SIRT1 which enhanced its stability. This modification facilitated the deacetylation of p53 protein, resulting in accelerated degradation of p53 and inhibition of cell senescence.

Conclusion: Our study highlights the role of SUMO modification in regulating the stability of SIRT1 and influencing nucleus pulposus cell senescence via modulation of the p53 signaling pathway. These findings provide novel targets and experimental evidence for potential therapeutic interventions against intervertebral disc degeneration (IDD).

P660
VERTEBRAL FRACTURES BY DXA: IS THE CURRENT DEFINITION ADEQUATE?

J. L. A. Morales Torres[1], J. Romero Ibarra[1], J. Morales Vargas[2]

[1]Hospital Aranda de la Parra, [2]Morales Vargas Centro de Investigacion, Leon, Mexico

Objective: Osteoporotic vertebral fractures (VF) indicate reduced bone strength and predict new fractures. Their identification in patients with suspected osteoporosis (OP) by DXA-based Vertebral Fracture Assessment (VFA) improves current definition of OP[1]. We aimed to describe the frequency of VF in patients referred to an osteodensitometry (ODM) center using the commonly accepted definition.

Methods: We included patients referred for an ODM study, who underwent a VFA as they met criteria for it[2]. VFA studies were performed on a GE-Lunar, iDXA device. We report the frequency of VF defined as a loss of vertebral body height of $\geq$ 20% in one or more segments[1]. The characteristics of those with and without VF are compared by Student's t-test.

Results: We included 1226 patients (91.9% women) with a mean age of 74 ($\pm$ 8.5) y, seen since the end of 2021. Of these, 807 (65.8%) had at least one VF and 419 (34.2%) had none. Their characteristics are summarized in Table 1. Mean BMD is significantly lower in the VF population.

Table 1. Characteristics of the patients included

	No fracture (n=419)	With fracture (n=807)	P
Mean age	73.2 (±8.28)	74.82 (±8.71)	0.0017
Mean height	154.1(±10.41)	152.1(±8.39)	0.0003
Mean Weight	64.67(±13.56)	62.84(±11.91)	0.0136
Spine BMD (± SD)	1.028 (±0.207)	0.982 (±0.214)	0.0003
Spine BMD (± SD)	0.854 (±0.164)	0.777 (±0.152)	0.0001

Conclusion: Prevalence of VF in the community is 19.2 for women and 9.8 for men in Mexico[3]. Findings of this report exceed that. Population referred to ODM is more likely to have OP but, is the 20% limit adequate to define the presence of a fracture? Current paradigm prompts to consider all patients with a VF as having OP and requiring pharmacological therapy[1]. We found a high frequency of VF by VFA. According to the current definition, all such patients should be considered candidates for OP treatment.

References:

Diacinti D, et al. Quant Imaging Med Surg 2019;9:1485

2. iscd.org/learn/official-positions/. Consulted 16 Oct, 2023
3. Clark P, et al. Rev Invest Clin 2013;65:183

P661
SARCOPENIA CLINIC: THREE-YEAR EXPERIENCE OF A PRAGMATIC APPROACH

J. Morales Vargas[1], J. L. A. Morales Torres[2], A. Guadian Moreno[1], P. Ramirez Muñoz[1]

[1]Morales Vargas Centro de Investigacion, [2]Hospital Aranda de la Parra, Leon, Mexico

Objective: The level of knowledge about frequency and impact of sarcopenia (SARC) is limited among the general population and health professionals. We have proposed a Sarcopenia Clinic (SC) with a pragmatic and comprehensive approach to manage SARC according to proposals of the European Working Group (EWGOSP) in real life, in Mexico[1]. We aimed to describe the findings of implementing a stepwise approach for identification and treatment of SARC.

Methods: Patients with suspected or screened positive for SARC are referred by their physicians and are evaluated following the algorithm proposed by the EWGSOP adapted to the center's resources. Malnourished patients or at risk of developing malnutrition receive nutritional assessment. Treating physicians obtain a report including strength, muscle mass, physical performance, nutritional risk and serum levels of 25OHvitamin D, with a Vivifrail[2] classification and a proposed management plan.

Results: From June 2021 to October, 2023, 135 patients referred from diverse services, have been evaluated. Their mean age was 66.8 $\pm$ 9.56 y and 72.6% were women. Tests included were completed in about 30 min. Table 1 summarizes the findings of patients evaluated. Among subjects not classified as SARC with the EWGSOP definition, we found low physical performance (16%), low strength (24%) and low muscle mass (60%).

Table 1. Findings in 135 patients at the Sarcopenia Clinic

Evaluation:	Interpretation	Frequency *
Nutritional Screening	Normal	51.1%
	Risk of malnutrition	36.6%
	Malnutrition	13.3%
Grip Strength	Normal	60.0%
	Low	37.8%
Get up and Go test	Normal Strength	73.3%
	Low strength	17.8%
	Unable	2.2%
	Not done	4.4%
Appendicular Muscle Mass Index	Normal	70.5%
	Low	29.5%
Physical Performance	Normal	77%
	Low	23%
Diagnostic conclusion	Normal	40.7%
	Probable SARC	22.2%
	SARC	10.4%
	Severe SARC	6.7%

*Some of the sums do not reach 100% due to the impossibility of completing an evaluation.

Conclusion: The methodology implemented in the SC allows the identification of subjects with SARC and peri-sarcopenic conditions and may orient their treating physicians to implement early preventive and therapeutic approaches.

References:

1. Cruz-Jentoft AJ, et al. Age Ageing. 2019;48:16
2. https://vivifrail.com/es/inicio/. Retrieved October 15, 2023

P662
ASSOCIATION BETWEEN BONE MINERAL DENSITY AND BODY COMPOSITION AMONG MONGOLIAN ADULT WOMEN

J. N. Jargalsaikhan[1], A. G. Ajnai[1], S. S. Surenkhorloo[1]

[1]Fourth Hospital, Ulaanbaatar, Mongolia

Objective: Maintaining bone health is an important public health issue and challenge (concern) in women for preventing a determinant of the risk of developing osteoporosis later in life. The aim of the present study is to investigate the relationship between BMD, and body composition in a female population in Mongolia.

Methods: A sample of 309 women aged between 20–39 y who performed scans between January and December 2022 by DXA in Fourth Hospital. The correlation between BMD and total fat mass, total lean mass, and total bone mass was analyzed by Pearson correlation and multiple linear regression analysis.

Results: According to the DXA results, 76.4% of women had normal BMD, and 20.1% and 3.6% of women were diagnosed with osteopenia and osteoporosis, respectively. Multiple linear regression analysis indicated BMD was positively associated with total fat mass (β: 0.042, $p < 0.001$), total lean mass (β: 0.083, $p < 0.001$), and bone mass (β: 0.857, $p < 0.001$). The positive correlation of BMD and lean and bone mass was significant in younger women aged < 30 y, whereas women aged over 30 were positively associated with lean mass and fat mass. There were no significant relationships between BMD and body weight, percentage of body fat, and android/gynoid ratio parameters.

Conclusion: Women younger than 30 were associated with BMD, lean, and bone mass. Emphasizing lean mass and bone mass in young Mongolian women may be valuable for improving bone health.

P663
ULTRASOUND-GUIDED RADIOFREQUENCY ABLATION OF GENICULAR NERVES IN THE TREATMENT OF CHRONIC KNEE PAIN: A SINGLE-CENTER RETROSPECTIVE STUDY

J. Nurković[1]

[1]Center for Regeneration and Rehabilitation, Novi Pazar, Serbia

Objective: Radiofrequency (RF) treatment of the genicular nerves shows promise for managing chronic osteoarthritic and persistent postsurgical knee pain (PPSP) that doesn't respond to conventional medical management.

Methods: The retrospective single-center cohort study of patients treated with ultrasound-guided conventional RF of the genicular nerves for chronic knee pain was conducted in the Center for Regeneration and Rehabilitation Novi Pazar, Serbia, from October 2022 to November 2023. Subgroup analysis based on the etiology of pain (PPSP and degenerative knee pain) was performed in addition to the total study population analysis. Outcome parameters were global perceived effect (GPE), Numeric Rating Scale for pain, consumption of potent opioids, and treatment safety at six weeks and cross-sectionally at a variable time point. Treatment success was defined as GPE $\geq$ 50%.

Results: Results showed that out of 48 cases screened, 45 were included in the study, with 13 diagnosed with PPSP and 32 with degenerative knee pain. The study found that treatment success was achieved in 40 out of 45 interventions (88.9%) at six weeks, with similar results in both groups. Follow-up assessments showed that in 95% of patients with significantly reduced pain, this effect was maintained over 6 months and in 72% of patients over 9 months, with the mean duration of the impact of the RF treatment being 8.9 months. Additionally, the safety analysis conducted at six weeks and at the second time point showed a good safety profile of the treatment.

Conclusion: Conventional RF of the genicular nerves has shown promising results in the study population, with a success rate of over 88% for those refractories to conventional medical management. Additionally, the treatment was well-tolerated and had a mean duration of effect of 8.9 months.

P664
IS A KNEE X-RAY BETTER STANDING OR SITTING?

J. Nurković[1]

[1]Center for Regeneration and Rehabilitation, Novi Pazar, Serbia

Objective: To compare the joint space width between standing and sitting radiographs to diagnose the knee's primary osteoarthritis (OA).

Methods: Digital radiographs of 120 medial osteoarthritic knees in 60 patients were performed. The patients underwent standing and sitting anteroposterior (AP) views. The severity of the osteoarthritis was evaluated using the joint space width and Kellgren-Lawrence (KL) radiographic classification. The t-test was used for statistical analysis.

Results: The mean medial joint space width found in the standing and sitting view was measured at 1.5 mm and 2.3 mm, respectively ($p < 0.001$, 95%CI 0.45 to 0.67). 59%, 45.4%, and 21.4% of the knees diagnosed with a KL grade of I, II, and III in the standing views were changed to KL grade II, III, and IV in the sitting views, respectively. No changes for KL IV osteoarthritis diagnoses have been found between standing and sitting views.

Conclusion: Standing radiographs better represent joint space width than sitting radiographs. 59% of standing radiographs have changed the KL grading to a more severe grade than that in the sitting radiographs. It is recommended to use a standing knee X-ray for OA diagnostics.

P665
RADIOFREQUENCY ABLATION TO TREAT OSTEOARTHRITIS OF THE KNEE

J. Nurković[1]

[1]Center for Regeneration and Rehabilitation, Novi Pazar, Serbia

Objective: Recent evidence suggests a benefit in radiofrequency (RF) treatment of genicular nerves for the knee in managing moderate to severe osteoarthritis (OA). There is a reported reduction in pain and improved function. However, there is very little level-one literature available that supports this practice and conclusively proves a benefit. There are only several randomized control trials conducted in North America that are proving their efficacy.
This study aimed to determine if RF treatment of genicular nerves administered in patients with knee OA over three to twelve months demonstrated any benefit.
Methods: The WOMAC tool was used before RF treatments and one year after the RF treatments in 45 patients. RF ablation was performed on all three branches of the n. genicular in all patients. The outcomes observed were pain, stiffness, and physical function, and the total WOMAC score was calculated.
Results: RF ablation of genicular nerves reduced total WOMAC score, pain, stiffness, and physical function by 79.3%, 86.37%, 61.12%, and 58.03%, respectively, 3 months after the interventions. What is very important is that these effects were maintained a year after the treatments.
Conclusion: Results showed a trend of reduction in the WOMAC score. However, further studies are needed to explore whether the grade of OA and patients' weight significantly impact the results and when it is time to repeat interventions.

P666
PRECISION NAIL PRESERVATION: A MINIMALLY DAMAGING TECHNIQUE FOR TREATMENT OF AN ELUSIVE SOFT TISSUE BENIGN NEOPLASM

J. P. Pereira[1], A. V. Vilela[1], J. A. Azevedo[1], D. F. Ferreira[1], L. F. R. Rodrigues[1], P. V. Varanda[1]

[1]Hospital de Braga, Braga, Portugal

In the realm of soft tissue neoplasms, digital fibromyxoma (DF) stands as a rare and benign entity, frequently targeting the digits, especially the nail apparatus. Its clinical manifestation involves a gradual development of a mass, accompanied by xanthonychia, nail thickening, and proximal paronychia. This often leads to diagnostic challenges, with frequent misidentification as a fungal infection. The primary approach to address DF is through en-bloc resection, despite a notable recurrence risk.
Case report: This case revolves around a 48-year-old female presenting a 2-y history of discoloration and thickening of the right third fingernail. Initial treatment with anti-fungal agents was unsuccessful. As such, surgical treatment was decided upon, which consisted on longitudinal partial proximal plate nail avulsion. This procedure unveiled a consistent, gelatinous, and well-demarcated flesh-colored lesion. Histopathological examination validated the diagnosis of DF, showcasing CD34 positivity and pS-100 immunomarker negativity. Over the subsequent 12 months of follow-up, the patient remained completely asymptomatic, free from any signs of lesion recurrence or nail dystrophy.
Conclusion: Emphasizing the importance of preserving the nail matrix and achieving optimal clinical outcomes, this case report advocates for the adoption of minimally damaging techniques when approaching soft tissue tumors around the nail apparatus. Recognizing this rare entity and understanding its characteristic presentation holds the utmost significance for ensuring precise diagnosis and timely surgical management.

P667
BONE MINERAL DENSITY T-SCORES COMPARISON BETWEEN OBESE AND NON-OBESE INDIVIDUALS INCLUDED IN A FRACTURE LIAISON SERVICE FOLLOWING A RECENT FRAGILITY FRACTURE

G. Marchasson[1], B. Cortet[1], C. Philippoteaux[1], I. Legroux-Gérot[1], J. Paccou[1], H. Béhal[1]

[1]Lille Univ. Hospital, Lille, France

Objective: To compare the mean T-scores of obese and non-obese patients after recent fragility fractures.
Methods: Over a period of 5.5 y, from January 2016 to May 2021, patients from a fracture liaison service were identified and their demographic characteristics, osteoporosis risk factors, BMD T-scores, and fracture sites were compared between obese (BMI $\geq$ 30 kg/m^2) and non-obese (19 kg/m^2 $<$ BMI $<$ 30 kg/m^2) patients.
Results: A total of 712 patients were included (80.1% women; mean age 73.8 $\pm$ 11.3 y). 16% had type 2 diabetes mellitus and 80% had a major osteoporotic fracture (MOF). 135 patients were obese and 577 non-obese, with obese patients younger ($p < 0.001$) and more frequently female ($p = 0.03$). Obese patients presented with fewer hip fractures (10 vs. 21%, $p = 0.003$) and more proximal humerus fractures (16 vs. 7%, $p < 0.001$) than non-obese patients. After adjusting for age, sex, and diabetes mellitus, BMD T-score values were significantly higher at all measurement sites (lumbar spine, total hip, and femoral neck) in obese patients than in non-obese patients for all types of fractures, with a mean difference of 1 standard deviation ($p < 0.001$ for all comparisons). The same results were observed in the population limited to MOF.

	Obese patients	Non-obese patients	T-score differences	P-value
	All fractures (n=712)			
	n=135	n=577		
BMD T-score; lumbar spine[1]	-0.7 [-1.0; -0.4]	-1.6 [-1.8; -1.5]	-0.9 [-1.3; -0.5]	<0.001
BMD T-score; total hip[2]	-0.7 [-0.9; -0.5]	-1.8 [-1.9; -1.6]	-1.0 [-1.3; -0.8]	<0.001
BMD T-score; femoral neck[3]	-1.5 [-1.7; -1.3]	-2.1 [-2.3; -2.0]	-0.6 [-0.9; -0.4]	<0.001
	Major osteoporotic fractures (MOF) (n=569)			
	n=98	n=471		
BMD T-score; lumbar spine[4]	-0.8 [-1.2; -0.4]	-1.6 [-1.8; -1.4]	-0.9 [-1.3; -0.4]	<0.001
BMD T-score; total hip[5]	-0.8 [-1.0; -0.5]	-1.8 [-1.9; -1.6]	-1.0 [-1.3; -0.7]	<0.001
BMD T-score; femoral neck[6]	-1.5 [-1.8; -1.2]	-2.1 [-2.3; -2.0]	-0.6 [-0.9; -0.4]	<0.001

Conclusion: Given the crucial role of BMD T-score in determining the need for anti-osteoporotic medication following fragility fractures, it is reasonable to question the existing T-score thresholds in obese patients.

P668
BONE TURNOVER IN PATIENTS WITH DIFFERENTIATED THYROID CANCER UNDER THYROXINE SUPPRESSIVE THERAPY

J. S. Hwang[1], J. F. Chen[2]

[1]Chang Gung Memorial Hospital, Taoyuan, [2]Chang Gung Memorial Hospital, Kaohsiung, Taiwan

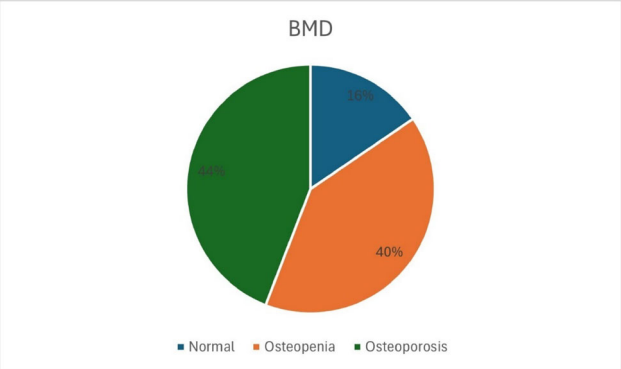
Objective: Differentiated thyroid carcinoma is the most common endocrine neoplasia, after thyroidectomy with/without radioiodine treatment, patients required levothyroxine therapy to suppress thyrotropin-stimulating hormone to reduces tumor recurrence rates. Endogenous hyperthyroidism has been shown may reduce bone density due to accelerates bone turnover and shortens the normal bone remodeling cycle. Furthermore, in the FRAX model, common risk factors and BMD were also estimated the fracture risk in untreated long-standing hyperthyroidism patients. Although, many studies have investigated bone turnover markers have useful in fracture risk assessment and monitoring treatment efficacy in postmenopausal osteoporosis. The aim of this study is to evaluate the bone turnover and fracture risk in postmenopausal osteoporosis women with thyroid cancer under thyroxine suppressive therapy.
Methods: This cross-sectional study investigated patients who were postmenopausal osteoporosis women with differentiated thyroid cancer follow-up at endocrine clinic. In this study, country-specific fracture risk for 10-y probability of a hip or major osteoporotic fracture, were calculated by the WHO Collaborating Center, using the FRAX algorithm. The FRAX algorithm includes femoral neck BMD, age, sex, BMI, previous history of fracture, parental history of hip fracture, current smoking, recent use of corticosteroids, presence of rheumatoid arthritis, secondary osteoporosis cause and at least 3 alcoholic beverages per day. A single, fasting blood sample to assess bone markers, and other biochemical tests were performed in the study visit. Patients were measure the bone specific alkaline phosphatase for formation markers, and β-CrossLaps (β-CTX) for resorption markers were analyzed the bone turnover rate.
Results: In this cross-sectional study, we investigated 64 Taiwanese postmenopausal women, with 34 thyroid cancer subject diagnosed 2–6 y and 30 non- thyroid cancer postmenopausal osteoporosis women at osteoporosis clinic, aged between 50–62 y, found both bone formation and resorption markers were elevated in thyroid cancer patients under thyroxine suppressive therapy.
Conclusion: Postmenopausal osteoporosis women with differentiated thyroid cancer under thyroxine suppressive therapy for 3 y have high bone turnover markers, but no significant difference risk for 10-y major or hip fracture probability by FRAX than non- thyroid cancer osteoporosis women.

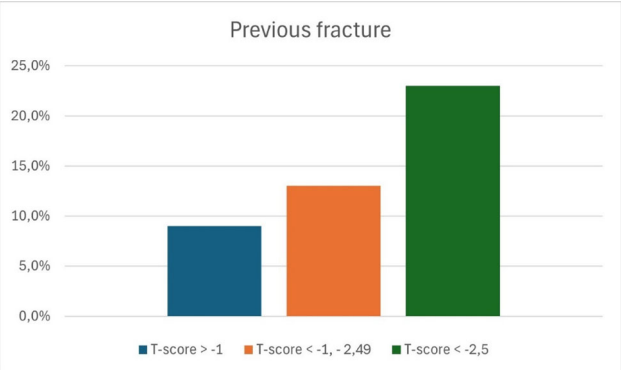
P669
BONE DENSITOMETRY AND FRAGILITY FRACTURE RISK

J. Sacramento[1], N. Montesino[1], N. Padrón[1], M. J. Montesa[1], B. González[1]

[1]Hospital Universitario Nuestra Señora de Candelaria, Santa Cruz de Tenerife, Spain

Objective: To evaluate BMD outcomes in patients who have suffered a vertebral fragility fracture during the previous year.
Methods: Observational, descriptive, cross-sectional, single-center study. Consecutively included patients ≥ 50 y seen from January 2017 to December 2023 in patients referred to a Fracture Liaison Service (FLS) for recent fragility vertebral fracture (during the last year).
Results: 225 patients were included and DXA was performed on 136. The reasons for not carrying it out were absence or because its result was not going to modify therapy decision. 85.29% were women with a mean age of 71.4 (± 8.55) y. At the time of the fracture, only 44.12% had a T-score < -2.5 SD, while more than half had osteopenia (40.44%, T-score between—1.0 and—2.5) or normal BMD (15.44%, T-score -1.0 or greater) (Fig. 1). Furthermore, 33.09% had a previous history of fragility fracture, and 10% of them had normal BMD (Fig. 2).





Conclusion: In our cohort, less than half of the patients with vertebral fragility fracture had densitometric osteoporosis and even 16% had normal densitometric values. The normality of the DXA does not exempt the presence of bone fragility in this patient profile.

P670
THE EXPERIENCE OF FEELING OLD AFTER A FRAGILITY FRACTURE

J. Sale[1], L. Frankel[1], E. Bogoch[1], G. Carlin-Coleman[1], S. Hui[1], J. Saini[1], J. Mckinlay[1], L. Meadows[2]

[1]Unity Health Toronto, Toronto, [2]Univ. of Calgary, Calgary, Canada

Objective: There has been little exploration of the effect of fragility fractures on patient perceptions of their age. The common assumption is that fractures "happen to old people". In individuals with a fragility fracture, our objective was to explore the experience of feeling old after sustaining a fragility fracture.
Methods: A secondary analysis of data from 145 community-dwelling women and men participating in six qualitative primary studies was conducted relying on a phenomenological approach. Participants were English-speaking, 45 years and older, who had

sustained a recent fragility fracture or reported a history of previous fragility fractures. Data for the analysis included direct statements about feeling old as well any discussions relevant to age post-fracture.
Results: We highlight two interpretations based on how individuals with a history of fragility fracture talked about age: 1) Participants described feeling old post-fracture. Several participants made explicit statements about being "old". However, the majority of participants discussed experiences post-fracture that implied that they felt old and had resigned themselves to being old. This appeared to entail a shift in thinking and perception of self that was permanent and had become a part of their identity; and 2) Perceptions of increasing age after sustaining a fracture were reinforced by health care providers, family, and friends.
Conclusion: Our findings challenge the notion that fractures "happen to old people" and suggest that fractures can make people feel, and embody, feeling old.

P671
THE NEED FOR FRACTURE LIAISON SERVICES IN A REHABILITATION HOSPITAL SETTING

J. Sale[1], T. Inrig[1], E. Bogoch[1], A. Verduyn[1], S. Journeay[1], V. Elliot-Gibson[1], L. Ly[1]

[1]Unity Health Toronto, Toronto, Canada

Objective: Fracture prevention has not been a priority in rehabilitation settings yet 40% of hip fracture patients are admitted to a rehabilitation hospital in Ontario, Canada, and fractures account for 30% of inpatients in Canadian rehabilitation hospitals. Our aim was to adapt the Fracture Liaison Service (FLS) model of care to a rehabilitation hospital in Ontario in order to address the unique fracture prevention needs of patients in this setting.
Methods: We reviewed 736 fracture admissions to a rehabilitation hospital without an FLS over an 18-month period (pre-COVID). Fractures of the hip and spine were automatically considered high risk for future fracture and indicated for pharmacological intervention based on the Canadian guidelines. According to the guidelines, patients with non-hip and non-spine fractures should be recommended a BMD test to assess fracture risk status. We examined the electronic discharge pharmacy medication list in patients' charts for bone health recommendations.
Results: Length of stay for inpatients with a fragility fracture (mean age of 80 y; approximately 70% female) was two weeks or greater. Of 736 fracture patients, 474 (64%) were automatically considered high risk. Of the high risk patients, 22% were discharged with a bone active medication. Of the remaining patients (assumed to be not high risk), 6% received a BMD test recommendation at discharge.
Conclusion: We identified a 78% treatment gap in patients deemed high risk for future fracture. The rehabilitation setting is an ideal location to identify patients who need immediate bone health treatment.

P672
CORRELATION BETWEEN CALCIUM INTAKE AND BONE MINERAL DENSITY IN A SOUTH AMERICAN COHORT

J. Sanabria[1], S. A. Blanco[1], L. A. Dulcey[1], J. A. Gomez[1], E. Y. Gutierrez[1], A. P. Lizcano[1]

[1]Autonomous Univ. of Bucaramanga, Bucaramanga, Colombia

Objective: To determine the influence of calcium intake on BMD values in the adult female population at a South American hospital, seeking to assess calcium consumption through 24-h dietary recalls and nutritional status for analysis of the relationship between intake of this mineral and found BMD values, also comparing said intake with ideal recommendations, in order to generate useful information on dietary habits and osteoporosis prevention in this population.
Methods: A cross-sectional analytical observational study was conducted in 100 female patients over 35 years old who attended the Bone Densitometry and Nutrition Services at a South American hospital over 4 months. The 24-h calcium intake recall method was used; weight in kg and height were recorded with a Harpenden stadiometer, then calculating BMI; an X-ray bone densitometry was performed at the femoral neck and entire hip level. Finally, the reported calcium intake was related to the obtained BMD values to determine the possible influence between these variables.
Results: The majority presented overweight (40%) or obesity (21%) with an average calcium intake lower than recommended by age. 78% of patients had an inadequate intake of the mineral, regardless of nutritional status. The diagnosis of osteoporosis (79%) predominated, associated with low calcium intake. A positive correlation was found between the intake of this mineral and BMD values in hip regions.
Conclusion: Calcium intake influenced BMD values in the analyzed adult female population. The majority of patients presented overweight and obesity, as well as a calcium intake below the recommendations for their age. It is concluded that inadequate calcium intake influenced low bone mineralization and the development of osteoporosis in the studied population, highlighting the importance of an adequate intake of this mineral for bone health.

P673
TRENDS OF SERUM 25(OH)D LEVELS IN PATIENTS HOSPITALIZED DURING YEARS 2018–2020

J. Smaha[1], M. Kužma[1], P. Jackuliak[1], J. Hrtánková[1], J. Payer[1]

[1]5th Dept. of Internal Medicine, Comenius Univ. Faculty of Medicine, Univ. Hospital Bratislava, Bratislava, Slovakia

Objective: Recently, an increased research interest in vitamin D and its nonclassical effects, such as its influence on the immune system or the course and prognosis of acute respiratory diseases, was seen. How this transformed the vitamin D status of patients in actual clinical practice is unclear.
Methods: A retrospective analysis of the health records of all patients admitted to the general internal ward of University Hospital Bratislava, Slovak Republic, between 2018–2020 was performed. Our primary outcome was to compare yearly average 25- hydroxyvitamin D (25(OH)D) levels and to compare the proportion of patients who had their blood tested for 25(OH)D upon admission.
Results: In total, 10,175 patients' admission forms, of which 3258 patients had a serum 25(OH)D level assessed upon admission, were reviewed. A significantly higher percentage of patients with blood tested for 25(OH)D concentration during the monitoring period was. observed. 23%, 34 and 42% of patients (between-group differences with $p < 0.001$) were tested during 2018, 2019, and 2020, respectively. There was a significant difference in average mean 25(OH)D serum levels between three years (2018–20) ($p = 0.005$). The mean value of 25(OH)D in 2018 (15.08 ng/mL $\pm$ 9.22) was significantly lower than in 2019 (15.98 ng/mL $\pm$ 9.35; $p = 0.031$) and in 2020 (16.76 ng/mL $\pm$ 9.92; $p = 0.001$). Mean serum 25(OH)D concentration increased by 1.68 ng/mL in the recorded period.
Conclusion: The proportion of vitamin D-tested patients and serum 25(OH)D concentration increased during the observed period. Our data suggest increasing awareness about vitamin D status in clinical practice.

P674
TREATMENT WITH LORECIVIVINT LEADS TO IMPROVED LONG-TERM PATIENT ACCEPTABLE SYMPTOM STATE (PASS) COMPARED TO PLACEBO: DATA FROM PHASE 3 EXTENSION TRIAL.

C. Swearingen[1], Y. Yazici[1], J. Tambiah[1], P. Conaghan[2]

[1]Biosplice Therapeutics, Inc, San Diego, USA, [2]Univ. of Leeds School of Medicine, Leeds, UK

Objective: Lorecivivint (LOR) has demonstrated beneficial effects on clinical outcomes in knee OA trials. A "patient acceptable symptom state" (PASS) also provides a clinically relevant assessment (Roos 2019). Year 1 results from a Phase 3 extension study, OA-07 (NCT04520607), with LOR 0.07 mg clinical outcomes including WOMAC Pain [0–100] and Function [0–100], were evaluated for PASS.
Methods: Severe knee OA patients (medial JSW 1.5–4.0 mm) who completed the parent trial were enrolled into the OA-07 extension. A repeat injection according to original parent randomization (LOR/-placebo (PBO)) was given at OA-07 Year 1 start to blinded patients irrespective of symptom state. PASS is assessed with a 'yes/no' response to the question "Taking into account all the activities you have during your daily life, your level of pain, and also your functional impairment, do you consider that your current state is satisfactory?" at parent study baseline and end of OA-07 Year 1. PASS response and odds ratios (OR; 95%CI) between treatment groups were calculated using baseline-adjusted logistic regression. Differences between treatment groups were explored for patients with a positive PASS.
Results: 276 patients (mean age 61.0 ± 8.2 y, BMI 31.8 ± 4.9 kg/m^2, female 62.7%, Kellgren-Lawrence [KL] 3 45.3%, medial JSW 2.63 ± 0.69 mm) were enrolled. Adverse event data showed LOR appeared safe. Following the repeat injection, compared to PBO at end of Year 1: LOR treatment significantly increased odds of a 'yes' PASS response (LOR 103/121 (85.1%) vs. PBO 93/129 (72.1%), OR 2.45 [1.25, 4.78], P = 0.009) (Figure); patients with a 'yes' PASS response also reported improvements in WOMAC Pain (LOR -6.8 (± 2.0) vs. PBO -1.0 (± 2.1), t-test P = 0.049) and Function (LOR -7.0 (± 1.9) vs. PBO -2.4 (± 1.9), t-test P = 0.090).

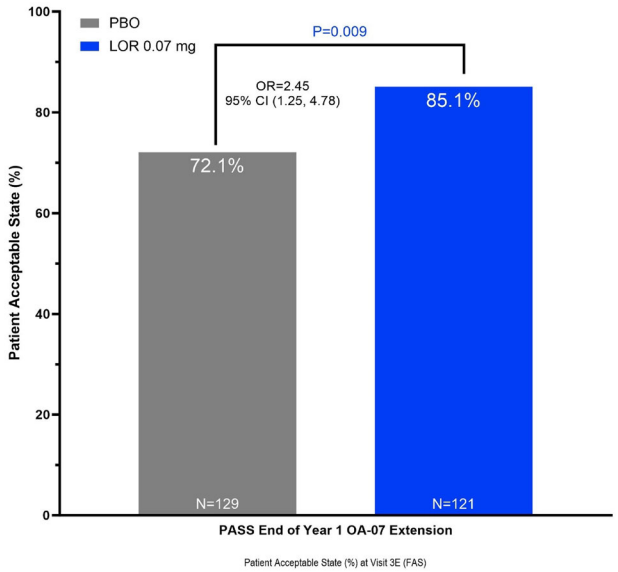


Figure. Patient Acceptable Symptom State between LOR and PBO at End of Year 1 Extension

Conclusion: Compared to PBO, LOR-treated Knee OA patients were significantly more likely to achieve a positive PASS 1 year after a second injection. Pain and function outcomes showed greater improvements for subjects reporting a positive PASS. These data suggest that LOR may provide long-term benefits for knee OA symptoms.
Reference: Roos EM, et al. Br J Sports Med 2019;53:1474.

P675
GAUDI STUDY: EFFECTIVENESS OF SPECIALIZED PRO-RESOLVING MEDIATORS SUPPLEMENTATION IN KNEE OSTEOARTHRITIS PATIENTS

J. Vergés[1], I. Möller[2], G. Rodas[3], J. M. Villalón[4], J. A. Rodas[5], F. Angulo[6], N. Martinez[1]

[1]Osteoarthritis Foundation International (OAFI), Barcelona, [2]Institut Poal de Reumatología, Barcelona, [3]FC Barcelona, Barcelona, [4]FC Atlético de Madrid, Madrid, [5]Asturias Football Federation, Avilés, [6]Athletic FC, Bilbao, Spain

Objective: To assess the effectiveness and safety of Specialized Pro-resolving Mediators (SPM) supplementation in reducing knee pain in patients with symptomatic knee osteoarthritis (KOA).
Methods: A randomized, double-blind, pilot study, was conducted on 5 Spanish centers and included adults aged 18–68, both current and former football players diagnosed with KOA at grades 2–4 on the K-L radiological scale. For 12 weeks, the treatment group received SPM-enriched oil supplementation, while the control group received olive oil supplementation. Patients were evaluated using various measures, including the VAS and OMERACT-OARSI score for pain intensity and type, WOMAC index for stiffness and function, EUROQoL-5 for health-related quality of life, and monitoring of concomitant, rescue, and anti-inflammatory medication use.
Results: A total of 51 participants participated in the study. In the treatment group (n = 23), where the mean age was 61.2 y with 52.17% being female, while the control group (n = 28) had a mean age of 57.3 y, with 53.57% females. Most patients had KOA at grade 2 on the K-L scale (73.91% and 67.86% respectively). The SPM group experienced a notable reduction in pain on the VAS after 8 (p = 0.039) and 12 (p = 0.031) weeks compared to the placebo group. Intermittent pain significantly reduced after 12 weeks (p = 0.019) in the SPM group compared to placebo (p = 0.091). Functional status did not change significantly after SPM or placebo consumption. Remarkably, the SPM group showed enhancements in all five aspects of the EUROQoL-5, including a significant improvement in the dimension of usual activities. None of the participants required rescue medication, and no adverse events were reported.
Conclusion: These findings suggest that sustained SPM consumption reduces pain in KOA patients, improving their quality of life, and support the safety and tolerability profile of SPM supplementation.

P676
DEVELOPMENT AND VALIDATION OF PREDICTIVE MODELS FOR HIP OSTEOPOROSIS IN WOMEN USING ELECTRONIC HEALTH RECORDS

J. W. L. Jin[1], S. Z. F. Sheng[1]

[1]Health Management Center, Second Xiangya Hospital of Central South Univ., Changsha, China

Objective: Hip fractures are associated with reduced mobility, morbidity, mortality and high healthcare costs, and approximately 90% of hip fractures in the elderly are associated with osteoporosis, making it particularly important to screen the population for hip osteoporosis and intervene early. DXA) has limited accessibility, so predictive

models for hip osteoporosis that do not use BMD data are essential. We aimed to develop and validate gender-specific hip osteoporosis prediction models using electronic health records (EHRs) without BMD data.

Methods: In this retrospective cross-sectional study, anonymous medical electronic records aged $\geq$ 50 y were exported from the Health Management Center of the Second Xiangya Hospital from September 2013 to November 2023. A total of 8039 women were included in the derivation cohort. The cohort was randomized into a 75% training dataset and a 25% internal test dataset. Using 50 potential predictors (demographic, examination and laboratory data from electronic records), the variables that would ultimately enter the model were selected after parameter selection, and the model was trained using six machine learning (ML) algorithms: logistic regression (LR), decision trees, random forests, xgboost, support vector machines and neural networks, and the model was tuned using five-fold cross-validation. The best model was determined by comparing the performance of the test set.

Results: 8 variables were entered into the model and the xgboost model had the highest AUC 0.8064 (95%CI: 0.7805–0.8322), which was superior to OSTA 0.65 (95%CI: 0.6206–0.6784).

Conclusion: The xgboost model can be integrated into routine clinical workflows to help identify people at high risk of osteoporosis in the hip who require a DXA scan.

P677
ANALYSIS OF RISK FACTORS FOR COMPRESSION RATE PROGRESSION IN OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURES

J. W. Soh[1], T. J. Jeong[1]

[1]Sahmyook Seoul Medical Center/Orthopaedic Surgery, Seoul, South Korea

Objective: In osteoporotic vertebral compression fractures(OVCF), vertebral body compression often progressed. We analyzed whether there were any factors affecting the progression of the compression rate and also investigated the period when the compression rate progressed the most.

Methods: A retrospective study. Among 76 patients visited with OVCF, excluding 15 patients, 61 patients who could be followed up for more than 6 months were included in this study. The associations between age, gender, fractured level, BMD, BMI, previous osteoporosis medication, initial compression rate, pelvic incidence, and the compression rate progressed by more than 30% at the final follow-up compared to the initial compression were analyzed. In addition, compression rates were measured at the initial, 1st month, 2nd month, and 3rd month, and the time period affecting the compression rate progression was analyzed. Statistical univariate analysis was performed with the Chi-square test and multivariate logistic regression analysis was done by using SPSS 25 ($p < 0.05$).

Results: In univariate analysis, other factors were not associated, but an increase in compression rate was significantly high in cases when the initial compression rate was 30% or more ($p = 0.001$). In multivariate logistic regression analysis, it was analyzed as significant when the initial compression rate was 30% or more ($p = 0.003$, odds ratio = 5.932). Also, with respect to the time period affecting compression rate progression, in univariate analysis, the compression rate at the initial ($p = 0.001$) and 1st month ($p = 0.010$) was significant, and in multivariate logistic regression analysis, the compression rate at 1st month was significant($p = 0.020$, odds ratio = 9.226).

Conclusion: If the initial compression rate was 30% or more, there was a high probability that the compression rate progressed. Also, it was analyzed that the period up to 1st month after the fracture had the most influence on the compression rate progression. When performing conservative treatment of patients with osteoporotic compression fractures, it is considered that these points should be taken into account.

P678
COMMUNITY FRACTURE CAPTURE: A NOVEL ONLINE LEARNING TOOL

A. Elsayed[1], C. Chiang[2], R. Audehm[3], A. Gorelik[4], S. Chang[5], C. Yates[2], S. Snow[6], R. Barmanray[2], S. Price[7], L. Collins[8], J. Wark[9]

[1]Univ. of Melbourne, Dept. of Medicine (Royal Melbourne Hospital), Melbourne, [2]Melbourne Health, Dept. of Diabetes and Endocrinology, Parkville, [3]Univ. of Melbourne, Dept. of General Practice and Primary Care, Melbourne, [4]Monash Univ., School of Public Health and Preventive Medicine, Melbourne, [5]Univ. of Melbourne, School of Computing and Information Systems, Melbourne, [6]Praxhub, Melbourne, [7]Royal Womens Hospital, Obstetric Medicine, Melbourne, [8]Royal Childrens Hospital, Dept. of Endocrinology, Melbourne, [9]Univ. of Melbourne, Dept. of Medicine (Royal Melbourne Hospital), Parkville, Australia

Objective: Osteoporosis treatment initiation post-fragility fracture is a challenging treatment gap. An interactive online Community Fracture Capture (CFC) learning hub is potentially attractive to address it. We aim to further develop a CFC Learning Hub with primary care physicians (PCP) to improve their knowledge and confidence in this topic.

Methods: The CFC Learning Hub is a secure online community site with flexible scheduling, comprising an online discussion forum with case studies contributed by participants and a knowledge repository. The platform allows participants to post questions and comments, receiving guidance from bone specialists and senior PCP facilitators to fulfill each module's learning objectives. It also permits online surveys and utilizes backend analytics to evaluate knowledge, level of activity and engagement, and progress.

Results: Four 6-week small-group cycles involved 55 PCPs [median (IQR) years in practice 22 (16–34) y, over 80% metropolitan-based]. Topic modules covered osteoporosis, treatment, monitoring, and challenging conditions; higher PCP activity was in clinically-applicable themes. In program evaluation (n = 35/55): 91% reported joining the course either to learn from the expert or to improve patient management; 82% were satisfied with the content and the most popular aspects of the learning were small group learning (37%) and live webinars (26%) followed by interactive learning (20%) and on-demand videos (17%); 57% found the platform easy to use. The most popular access times were evening (66%) or weekends (29%). At completion, 89% were likely to recommend the training. Most participants were either entirely (73%) or partly (23%) satisfied that their training needs had been met.

Conclusion: The CFC program was created by bone specialists, PCPs, software engineers, and information technology specialists. This collaboration produced a user-friendly, case-based, interactive, and time-flexible program bridging investigation and management gaps in osteoporosis. It is customized to address challenges faced by PCPs, and also is relevant in diverse health-related and other fields.

Disclosure:
Amgen Australia and Theramex provided untied funding.

P679
COMPARATIVE ANALYSIS OF TERIPARATIDE AND ROMOSOZUMAB IN PREVENTING SYMPTOMATIC SUBSEQUENT VERTEBRAL COMPRESSION FRACTURE AFTER CEMENTING

W.-H. Kao[1], Y.-H. Chiang[1], W.-C. Lo[1], M.-H. Wu[1], J.- H. Jiann-Her[1]

[1]Taipei Medical Univ. Hospital, Taipei, Taiwan

Objective: Subsequent vertebral compression fracture (SVCF) is a common and impactful complication. Because it usually occurs in the subacute phase (< 6 months after cementing of the primary VCF), the timing of prevention is critical. Teriparatide (TP) reduces fracture risk after 6 months but it did not show its effects in the subacute phase. Romosozumab (RM) with a quick onset time has the potential to prevent SVCF in the subacute phase. Our study compares their effectiveness in preventing symptomatic SVCF requiring another operation.
Methods: This retrospective observational study at TMUH includes 226 patients treated with either TP or RM after vertebroplasty or kyphoplasty due to OVCF from January 1, 2021, to June 27, 2023. The characteristics of the patients were reviewed. The primary outcome was a symptomatic SVCF requiring another operation. The secondary outcome was adjacent or non-adjacent fracture.
Results: This study included 118 and 99 patients in TP and RM groups, respectively. Between both groups, we find no significant difference in terms of age, gender, BMI, BMD, and underlying condition including HTN, DM, dyslipidemia, CKD, CAD, autoimmune disease, cancer, COPD, and OVCF at thoracolumbar junction. The rate of SVCF was 4.0% (4/99) in RM group compared to 14.4% (17/118) in TP group with statistically significant difference ($p = 0.01$). The subsequent adjacent fracture rate was 2.0% (2/99) in RM group vs. 11.9% (14/118) in TP group, showing a significant difference ($p = 0.005$). In contrast, no significant difference was observed in the rate of non-adjacent fracture ($p = 0.76$).
Conclusion: RM was associated with reduced symptomatic SVCF compared to TP especially in the subacute phase, highlighting RM's potential advantage in preventing SVCFs on adjacent levels.

P680
A NATURAL LANGUAGE PROCESSING TOOL TO PROMOTE ADHERENCE TO HOME REHABILITATION AFTER TOTAL KNEE ARTHROPLASTY

J.-M. Blasco[1], B. Díaz-Díaz[1], D. Hernández-Guillén[1], J. Pérez-Maletzki[1], S. Roig-Casasús[1], A. Silvestre[2], I. Martínez-Garrido[3]

[1]Universitat de València, [2]Hospital Clinic i Universitari Valencia, [3]Hospital Universitari i Politècnic La Fe de València, Valencia, Spain

Objective: To evaluate the effectiveness of a natural language processing tool (NLPT) in promoting adherence to home rehabilitation after total knee arthroplasty.
Methods: Randomized clinical trial with two groups and participants from two Hospitals in Valencia, Spain (2020–2023) undergoing total knee replacement (TKR). The participants received standard postoperative rehabilitation; the use of an NLPT to assist with home exercises underpinned the difference between the groups. The day before the treatment participants were instructed via chatbot in a personal smartphone on aspects such as length and phases of the treatment. Then, messages were automated and sent every training day with recommendations, videos, and GIFs to instruct participants on how to exercise. Compliance with rehabilitation and clinical measures of function (WOMAC), pain (VAS), and levels of physical activity (IPAQ-E) were compared with CI set at 95%. All participants signed consent to participate. Ethics approval (no.2020/350 and no.2021–001-1) and prospective publication of methods [1].
Results: Overall, 91 participants were randomized and 65 completed the intervention (aged 70 yo.). Adherence was higher in the experimental group [89 vs. 74%; OR95% = 4.1 (1.2 to 14.9)]. Participants in the experimental group presented benefits on self-reported functionality (WOMAC) and increased levels of physical activity (IPAQ-E) with $p < 0.001$ over standard care. However, pain levels were similar among groups after the interventions.
Conclusion: A strategy to promote adherence to rehabilitation based on an automated chatbot was useful to increase adherence with early postoperative home rehabilitation in patients undergoing TKR over standard care. This translated into a better functional performance of participants, although similar benefits on pain to standard care.
Reference: (1) Blasco, J-M, et al. BMC Musculoskeletal Disorders 2023;24:1
Disclosure:
Funded by AEI, Spain; Project PID2020-115825RA-I00/AEI/https://doi.org/10.13039/501100011033. The funder played no role in the design and conduct of the study.

P681
CONFRONTING GLUCOCORTICOID-INDUCED OSTEOPOROSIS AND FRACTURES IN PATIENTS WITH RHEUMATOID ARTHRITIS: EXPLORING THE IMPACT OF TEGOPRAZAN AND PROTON PUMP INHIBITORS

J.-Y. Jung[1], J.-W. Kim[1], H.-A. Kim[1], C.-H. Suh[1], Y. J. Choi[2]

[1]Dept. of Rheumatology, Ajou Univ. School of Medicine, Suwon-si, Gyeonggi-do, [2]Dept. of Endocrinology and Metabolism, Ajou Univ. School of Medicine, Suwon-si, Gyeonggi-do, South Korea

Objective: Rheumatoid arthritis (RA) patients commonly use proton pump inhibitors (PPIs) due to long-term glucocorticoid or NSAID use, leading to acid-related gastroesophageal conditions. Recently, tegoprazan, a potassium-competitive acid blocker approved for acid-related diseases, emerged as a commercial alternative to PPIs with a faster onset. However, its impact on bone density and limited research comparing effects to PPIs remain unclear. This retrospective study aims to explore the impact of tegoprazan or PPIs in RA patients at risk of glucocorticoid-induced osteoporosis or fractures.
Methods: We retrospectively collected records of RA patients on current glucocorticoid treatment with a history of tegoprazan or PPI use for at least 3 months. Bone quality was assessed using BMD and TBS through DXA, with osteoporotic fractures confirmed via spinal radiographs.
Results: The study involved 87 patients in the tegoprazan group and 92 in the PPI group. No significant differences in baseline demographics, comorbidities, RA duration, or medication history were observed. Cumulative glucocorticoid doses were similar (tegoprazan 4,049 mg vs. PPI 4,124 mg, $p = 0.918$). Mean 25-(OH)-vitamin D concentrations showed no significant difference (tegoprazan 22.2 ng/ml vs. PPI 19.9 ng/ml, $p = 0.093$). In the evaluation of bone quality, no significant differences were found in baseline TBS (tegoprazan 1.37 vs. PPI 1.365, $p = 0.275$) or BMD at femoral neck ($p = 0.053$) and total hip ($p = 0.077$). No annual percentage changes were observed in TBS, femoral neck BMD, or total hip BMD during follow-up. Baseline L-spine BMD significantly differed between groups ($p < 0.001$), with no annual percentage change. the occurrence of osteoporotic fractures did not differ significantly between the two groups, with rates of 2.6% for tegoprazan and 3.3% for PPIs.
Conclusion: Our study found no significant differences in bone quality or osteoporotic fractures between tegoprazan and PPIs in RA patients at risk of glucocorticoid-induced osteoporosis. Considering

its faster onset and longer duration, tegoprazan could be considered a PPI substitute for acid-related gastroesophageal disease in RA patients.

P682
ASSESSMENT OF MUSCLE MASS AND FUNCTION OF PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

J.-W. Kim[1], J.-Y. Jung[1], C.-H. Suh[1], H.-A. Kim[1]

[1]Dept. of Rheumatology, Ajou Univ. School of Medicine, Suwon, South Korea

Objective: Decreased muscle mass and muscular dysfunction mainly occurs in elderly, relating to various disorders and causing problems. Even most patients with systemic lupus erythematosus (SLE) are young age, chronic inflammation and long-term use of glucocorticoids are known to affect impairment of muscular skeletal structure and function.
Methods: Several muscle mass indexes were measured with a body composition analyzer, physical performance was measured and SARC-F, a screening questionnaire, was investigated from all participants.
Results: There's no difference in age, height, weight, and BMI between 58 SLE patients and 44 HCs, and mean age were 43.3 ± 12.2 and 43.4 ± 11.0 y. Total muscle mass and appendicular lean mass index (aLM) didn't differ between SLE patients with HCs, but aLM/weight levels were significantly lower in SLE patients compared to those in HCs (0.32 ± 0.02 vs. 0.87 ± 0.15 kg/kg, $p < 0.001$). Moreover, grip strength levels significantly were lower in SLE patients compared to those in HCs (24.4 ± 10.2 vs. 28.0 ± 7.3 kg, $p = 0.005$), while walk speed levels were faster in SLE patients compared to those in HCs (4.1 ± 0.5 vs. 3.9 ± 0.5 m/s, $p = 0.01$). 7 (12.1%) patients with SLE were sarcopenia by EWGS, and 2 (3.4%) patients with SLE were sarcopenia by AWGS, and 2 (3.4%) patients reported sarcopenia by SARC-F questionnaire.
Conclusion: Decreased muscle mass and minimal muscular dysfunction were observed in patients with SLE.

P683
EFFICACY AND SAFETY OF CT-P41, A PROPOSED DENOSUMAB BIOSIMILAR, COMPARED TO REFERENCE DENOSUMAB (PROLIA) IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS

J.-Y. Reginster[1], E. Czerwinski[2], A. Strzelecka[3], K. Szymanowski[4], S. Postol[5], A. Poder[6], J. Supronik[7], K. Wilk[2], P. Borowy[2], T. Budlewski[8], M. Janowska-Maus[3], J. Kwiatek[4], S. H. Kim[9], J. H. Suh[9], N. R. Han[9], N. H. Kim[9], S. H. Bae[9], S. L. Silverman[10]

[1]Chair for Biomarkers of Chronic Diseases, College of Science, King Saud Univ., Riyadh, Saudi Arabia, [2]Krakowskie Centrum Medyczne, Kraków, Poland, [3]SOMED CR Sp. z o.o. Sp. Komandytowa—Lodz, Lódz, Poland, [4]Centrum Medyczne Poznan—PRATIA, Skórzewo, Poland, [5]Medical Center of Medbud—Clinic LLC, Kyiv, Ukraine, [6]Clinical Research Centre Ltd, Tartu, Estonia, [7]Osteo Medic SC Artur Racewicz Jerzy Supronik, Bialystok, Poland, [8]Dept. of Rheumatology, Medical Univ. of Lodz, Lodz, Poland, [9]Celltrion, Inc., Incheon, South Korea, [10]OMC Clinical Research Center and Cedars Sinai Medical Center, Beverly Hills, USA

Objective: To demonstrate similar efficacy, safety, and immunogenicity of CT-P41 and Prolia in postmenopausal women with osteoporosis (PMO).
Methods: This was a double-blind, active-controlled, Phase 3 study (NCT04757376) in PMO with lumbar spine BMD (LS-BMD) T-score of ≤ − 2.5 to ≥ − 4.0. A total of 479 patients were randomized (1:1) to receive 60 mg of CT-P41 or Prolia every 6 months. The primary efficacy endpoint was the percent change from baseline (%CFB) in LS-BMD at Week 52. The secondary efficacy endpoints were the %CFB in LS-BMD and in BMD at total hip (TH) and femoral neck (FN) and fracture incidence. Safety and immunogenicity were monitored during the study. Here, the results up to Week 52 in the CT-P41 and Prolia groups are presented.
Results: The therapeutic equivalence was demonstrated between the CT-P41 and Prolia groups in the mean %CFB in LS-BMD at Week 52 with 95%CIs for the treatment difference which was entirely within the predefined equivalence margins (± 1.503%) (Table 1). The mean %CFB in BMD for LS, TH, and FN increased after each dosing and were comparable between groups. A new vertebral fracture was reported for 1 patient each at Week 26 in both groups. There was no hip fracture reported and the incidence of nonvertebral fracture was similar between groups (CT-P41: 0.8%; Prolia: 1.7%). The incidence of adverse events (AEs) (CT-P41: 75.7%; Prolia: 70.2%) and serious AEs (CT-P41: 2.9%; Prolia: 4.2%) were similar between groups. Most AEs were Grade 1 or 2 and were not related to study drugs. Most patients had at least one anti-drug antibody (ADA) positive result due to the sensitive assay but most of the ADA titer values were low. There was no patient with a positive neutralizing antibody result.

Table 1. Percent Change from Baseline in BMD for Lumbar Spine by DXA at Week 52 (ANCOVA)

Analysis Set Group	n / N	LS Mean (SE)	LS Mean Difference	95% CI of LS Mean Difference	Mean difference and 95% CI (CT-P41 – Prolia)
Full Analysis Set					
CT-P41	222 / 239[1]	4.9317 (0.31508)	-0.139	(-0.826, 0.548)	-0.826, 0.548
Prolia	212 / 238[1]	5.0706 (0.32714)			
Per-protocol Set					-0.973, 0.414
CT-P41	215 / 215[2]	5.0330 (0.31640)	-0.280	(-0.973, 0.414)	
Prolia	202 / 202[2]	5.3125 (0.33505)			-1.503% 0 +1.503%

Abbreviation: ANCOVA, analysis of covariate; BMD, bone mineral density; CI, confidence interval; DXA, dual-energy X-ray absorptiometry; LS, least square; SE, standard error.
1. The number of patients who had a BMD assessment result for lumbar spine by DXA at Week 52 / The number of patients in full analysis set.
2. The number of patients who had a BMD assessment result for lumbar spine by DXA at Week 52 / The number of patients in per-protocol set.

Conclusion: The therapeutic equivalence of efficacy was demonstrated between the CT-P41 and Prolia in PMO. The secondary efficacy, safety, and immunogenicity results supported the similarity of CT-P41 and Prolia. CT-P41 was well tolerated with a safety profile comparable to that of Prolia.
Disclosures:
JYR: Consulting fees from Celltrion, Inc.; EC, AS, KS, SP, AP, JS, KW, TB, MJM, and JK: grants from Celltrion, Inc.; PB: grants from Cellrion, Inc. and consulting fees from Amgen and Astra Zeneca; SHK, JHS, NRH, NHK, and SHB: employees of Celltrion, Inc.; SLS: grants from Amgen and consulting fees from Amgen, Radius, and Celltrion Inc.

P684
PHARMACOKINETICS AND PHARMACODYNAMICS OF CT-P41, A PROPOSED DENOSUMAB BIOSIMILAR, COMPARED TO REFERENCE DENOSUMAB (PROLIA) IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS

J.-Y. Reginster[1], E. Czerwinski[2], A. Strzelecka[3], K. Szymanowski[4], S. Postol[5], A. Poder[6], J. Supronik[7], K. Wilk[2], P. Borowy[2], T. Budlewski[8], M. Janowska-Maus[3], J. Kwiatek[4], S. H. Kim[9], J. H. Suh[9], N. R. Han[9], N. H. Kim[9], S. H. Bae[9], S. L. Silverman[10]

[1]Chair for Biomarkers of Chronic Diseases, College of Science, King Saud Univ., Riyadh, Saudi Arabia, [2]Krakowskie Centrum Medyczne, Kraków, Poland, [3]SOMED CR Sp. z o.o. Sp. Komandytowa—Lodz, Lódz, Poland, [4]Centrum Medyczne Poznan—PRATIA, Skórzewo, Poland, [5]Medical Center of Medbud—Clinic LLC, Kyiv, Ukraine, [6]Clinical Research Centre Ltd, Tartu, Estonia, [7]Osteo Medic SC Artur Racewicz Jerzy Supronik, Bialystok, Poland, [8]Dept. of Rheumatology, Medical Univ. of Lodz, Lodz, Poland, [9]Celltrion, Inc.,

Incheon, South Korea, [10]OMC Clinical Research Center and Cedars Sinai Medical Center, Beverly Hills, USA

Objective: To demonstrate similar pharmacokinetics (PK) and pharmacodynamics (PD) of CT-P41 compared with Prolia in post-menopausal women with osteoporosis (PMO).
Methods: This was a double-blind, active-controlled, Phase 3 study (NCT04757376) in PMO with lumbar spine BMD (LS-BMD) T-score of ≤ -2.5 to ≥ -4.0. A total of 479 patients were randomized (1:1) to receive 60 mg of CT-P41 or Prolia every 6 months. The primary PD endpoint was the area under the effect curve (AUEC) of serum C-terminal cross-linking telopeptide of type I collagen (s-CTX) over the first 6 months. The secondary PD endpoints were the AUEC of procollagen type I N-terminal propeptide (P1NP) over the initial 6 months and the percent change from baseline (%CFB) of s-CTX and P1NP at Weeks 26, 52, and 78. The secondary PK endpoints included PK parameters over the first 6 months, trough serum concentration (C_{trough}), and serum concentration of denosumab up to Week 78. Here, the results up to Week 52 in the CT-P41 and Prolia groups are presented.
Results: The PD similarity was demonstrated between the CT-P41 and Prolia groups in the AUEC of s-CTX over the first 6 months with 95%CIs for the ratio of the geometric least square mean which was entirely within the predefined equivalence margins (80% to 125%) (Table 1). The mean AUEC of P1NP and the median %CFB for serum concentration of s-CTX and P1NP were also similar between groups. The PK parameters including maximum serum concentration (C_{max}), truncated area under the concentration–time curve from time zero to Week 26 ($AUC_{0\text{-}t}$), time of observed maximum serum concentration (T_{max}), volume of distribution (V_d), and terminal elimination half-life ($T_{1/2}$) over 26 weeks after the first dosing, C_{trough}, and serum concentration of denosumab were comparable between groups.

Table 1. Area Under the Effect Curve of s-CTX (day*%) over the Initial 6 Months (ANCOVA): Full Analysis Set

Group	n / N[1]	Geometric LS Mean	Geometric LS Mean Ratio	95% CI of Geometric LS Mean Ratio	Mean Ratio and 95% CI (CT-P41 / Prolia)
CT-P41	227 / 239	13835.3915	94.94	(90.75, 99.32)	0.9075 0.9932
Prolia	221 / 238	14572.6010			0.8 1 1.25

Abbreviation: ANCOVA, analysis of covariance; AUEC of s-CTX, area under the effect curve of serum carboxy-terminal cross-linking telopeptide of type I collagen over the initial 6 months (from Day 1 predose to Week 26 predose); CI, confidence interval; LS, least squares.
1. The number of patients who had the result of AUEC of s-CTX / The number of patients in full analysis set.

Conclusion: The equivalence of PD was demonstrated and the comparable PD results for the secondary PD endpoints supported the similarity of CT-P41 and Prolia. The PK profiles of CT-P41 were comparable to those of Prolia in PMO.
Disclosures:
JYR: Consulting fees from Celltrion, Inc.; EC, AS, KS, SP, AP, JS, KW, TB, MJM, and JK: grants from Celltrion, Inc.; PB: grants from Cellrion, Inc. and consulting fees from Amgen and Astra Zeneca; SHK, JHS, NRH, NHK, and SHB: employees of Celltrion, Inc.; SLS: grants from Amgen and consulting fees from Amgen, Radius, and Celltrion Inc.

P685
DEVELOPMENT OF PREDICTION MODEL FOR 1-YEAR MORTALITY AFTER HIP FRACTURE SURGERY

K. Alexiou[1], A. Koutalos[1], S. Varitimidis[1], T. Karachalios[1], K. Malizos[1]

[1]Univ. General Hospital of Larissa, Larissa, Greece

Objective: Hip fractures in the older persons have been associated with a lower quality of the patient's life, increased morbidity and mortality. The primary aim of this study is to identify risk factors of mortality at twelve months after surgery for hip fracture and construct a prognostic index serve at the decision making pre-operatively. Secondary outcomes include the evaluation of functional outcomes and quality of life after at one year after surgery for hip fractures.
Methods: This was a cohort retrospective study with prospectively collected data. The data have been prospectively collected in a tertiary care National Health System academic hospital and in a remote secondary care public hospital. Informed consent was obtained from all individual participants included in the study. From August 2013 to August 2016, 669 patients with hip fractures were treated in the tertiary hospital and another 169 patients were treated in the secondary hospital. 72 patients in the tertiary hospital and 22 in the secondary hospital did not show-up at the follow-up or could not be traced by telephone. So, the data from 597 patients of the tertiary hospital and 147 patients of the secondary hospital were available for analysis. Patient's demographics, functional and cognitive pre-fracture status, together with quality of life assessment and the peri-operative data were retrieved from the hospitals' medical records for retrospective analysis. Inclusion criteria included all patients above 65 years of age, that were admitted to hospital with a fragility or geriatric hip fracture. Pathological and high energy fractures were excluded. All surgeries were performed from or under the supervision of 14 trauma surgeons. The perioperative data were collected from medical charts and interviews. Functional Assessment Measure score, Short Form-12 and mortality were recorded at 12 months. Patients and surgery variables that were associated with increased mortality were used to develop a mortality index.
Results: In-hospital mortality was 2.4%. Mortality for the whole cohort was 19.4% at one year. In the tertiary hospital mortality was 18.3% while in the secondary it was 23.0%. Functional outcome at one year was similar to preoperative status, even though their level of physical function dropped after the hip surgery and slowly recovered. From the variables tested BMI < 25, age > 80, CCI > 6, time to surgery > 48 h, ASA ≥ 3, use of anti-coagulants and male sex was associated with increased mortality. Regression coefficients were used to construct a hip fracture mortality index with minimum value of 0 and a maximum value of 13. The higher points in the mortality index were attributed to the ASA score and CCI index (four and three respectively). A patient with a value of 8 to 10 is considered average risk (20–30% probability of death at one year). ROC curve was constructed for the prediction model. AUC was calculated at 0.814 (CI 95%, 0.769–0.859, $p < 0.001$) which is considered as excellent discrimination.
Conclusion: The mortality prediction model that was developed in this study calculates the risk of death at one year for patients with hip fractures. It is simple and could be implemented in everyday clinical practice. This index, however, cannot affect or modify the treatment management of hip fractures which is based on early surgery. Nonetheless, it could possibly detect high risk patients so appropriate management is initiated early. Furthermore, it is a useful tool for advising patients and caregivers.

P686
PREVALENCE OF GERIATRIC SYNDROMES IN PATIENTS 60 YEARS AND OLDER WITH VERTEBRAL FRACTURE

K. Belova[1], K. Gordzheladze[2], L. Shubin[1]

[1]Yaroslavl State Medical Univ., [2]Yaroslavl Regional Emergency Care Hospital n.a. N.V. Solovyev, Yaroslavl, Russia

Objective: To study the prevalence of geriatric syndromes (GS) in patients 60 years and older with clinical vertebral fracture.
Methods: We investigated all patients (n = 42) with a vertebral fracture aged 60 years and older who were admitted to Yaroslavl Regional Emergency Care Hospital n.a. N.V. Solovyev from 1.04.2021 to 1.09.2021. To assess the prevalence of major GS, we used the following scales: Barthel activities daily living index,

Lawton instrumental activities of daily living scale, National validated questionnaire for identification of frailty "Age is not a hindrance", Morse Fall Scale, SARC-F questionnaire, Mini-Cog test, Mini Nutritional assessment, visual analogue scale (VAS), Overactive Bladder Questionnaire Short Form, Geriatric depression scale, Insomnia Severity Index.
Results: The mean age of the patients was 69,7 ± 5,28 y. Using Barthel scale, we recognized that 36 (85,7%) patients were independent on assistance, 2 (4,76%) were mildly and 4 (9,52%) – moderately dependent. For complex activities (Lawton scale), 36 (85,7%) were independent on assistance. Frailty was detected in 2 (4,7%) patients, 8 (19,0%). patients had pre-frail condition. Probable sarcopenia was revealed in 10 (23,8%) patients. Malnutrition was detected in 1 (2,4%) patient. A high risk of falls was noted in 23 (54,8%) patients. Depression was detected in 13 (31,0%) respondents. Chronic pain syndrome disturbed 17 (40,5%) patients. Nicturia was detected in 27 (64,3%) patients, stress urinary incontinence in 1 (2,4%), combined urinary disorders in 2 (4,8%). Mild sleep disturbances were revealed in 10 (23,8%) patients, moderate and severe – in 2 (4,8%) in both cases. 16 (38,1%) patients had visual impairments, 11 (26,2%) had hearing problems. Generally, among all the hospitalized patients with vertebral fractures only 2 (4,8%) didn't have any GS, 22 (52,4%) had 1–2 GS, 7 (16,7%) had 3–4 GS, and 11 (26,2%) patients had ≥ 5 GS.
Conclusion: The results of this study confirm the high prevalence of GS in elderly patients with vertebral fracture.

P687
CORRELATION BETWEEN POLYPHARMACY AND GERIATRIC SYNDROMES IN PATIENTS 60 YEARS AND OLDER WITH HIP FRACTURE

K. Belova[1], K. Gordzheladze[2], M. Belov[3], L. Shubin[1]

[1]Yaroslavl State Medical Univ., [2]Yaroslavl Regional Emergency Care Hospital n.a. N.V. Solovyev, [3]Yaroslavl State Medical Univ., Yaroslavl Regional Emergency Care Hospital n.a. N.V. Solovyev, Yaroslavl, Russia

Objective: To assess polypharmacy in patients 60 years and older with a hip fracture and its correlation with the presence and severity of geriatric syndromes (GS).
Methods: We assessed all the patients (n = 140) with a hip fracture aged ≥ 60 y admitted to Yaroslavl Regional Emergency Care Hospital n.a. N.V. Solovyev from 1.04.2021 to 1.07.2021. To reveal major GS we used: Barthel activities daily living index, Lawton instrumental activities of daily living scale, National validated questionnaire for frailty "Age is not a hindrance", Morse Fall Scale, SARC-F questionnaire, Mini-Cog test, Mini Nutritional assessment, visual analogue scale (VAS), Overactive Bladder Questionnaire Short Form, Geriatric depression scale, Insomnia Severity Index. Statistical analysis was performed using Spearman's rank correlation coefficient.
Results: The mean age of patients was 81.3 ± 7.67 y (in women 82.5 ± 6.54 y, in men 75.86 ± 10.81 y). 22 (15,7%) patients were not interviewed due to severe dementia. Polypharmacy (taking 5 or more drugs before the hospitalization) was detected in 26 (21.3%) respondents. There was a strong correlation between polypharmacy and the presence of chronic pain (0.94), sarcopenia (0.87), urinary dysfunction (0.86), high risk of falls (0.83), malnutrition (0.79), depression (0.74), pre-frailty/frailty (0.72), insomnia (0.72), cognitive impairment (0.72), and an average correlation with high risk of falls (0.69). There was a strong correlation between polypharmacy and the severity of chronic pain (0.72), a moderate correlation with the severity or intensity (considering the number of points according to the questionnaires) of sarcopenia (0.62), frailty (0.59), malnutrition (0.58), insomnia (0.58), depression (0.56), cognitive impairment (0.51), risk of falls (0.66).
Conclusion: A moderate or strong correlation was found between polypharmacy and the presence, as well as the severity of most GS in patients with a hip fracture 60 years and older.

P688
CLINICAL OUTCOME OF PHYSICAL THERAPY FOR PATIENTS WITH PARTIAL ROTATOR CUFF TEAR

D. Simić-Panić[1], K. Bošković[2], S. Pantelinac[1], A. Knežević[1], D. Popović[1], S. Tomašević-Todorović[1]

[1]Faculty of Medicine, Univ. of Novi Sad, Medical Rehabilitation Clinic, Clinical Centre of Vojvodina, [2]Faculty of Medicine, Univ. of Novi Sad, Special Hospital for Rheumatic Diseases, Novi Sad, Serbia

Objective: To determine the effectiveness of therapeutic exercises and physical modalities (low-level laser therapy and transcutaneous electrical nerve stimulation) on the recovery of patients with symptomatic partial rotator cuff tears.
Methods: A prospective observational cohort study was conducted in an outpatient setting in Medical Rehabilitation Clinic, Clinical Centre of Vojvodina, Novi Sad, Serbia from June 1, 2022, to December 31, 2022. A total of 30 patients with clinically and radiologically diagnosed partial rotator cuff were included in the study. Patients were blindly randomized into two groups. The first group received TENS and therapeutic exercises while the second group received low-level laser therapy and therapeutic exercises. Outcome measures were patients' visual analog scale pain score, Western Ontario Rotator Cuff Index score, and the Shoulder Pain and Disability Index score at the baseline and after 6 weeks of treatment.
Results: Statistical analysis indicated a significant reduction in visual analog pain score (6.9 ± 1.04 vs. 3.6 ± 1.02), and improvement in Western Ontario Rotator Cuff Index score (63.8 ± 3.36 vs. 72.6 ± 2.64), and the Shoulder Pain and Disability Index score (75.1 ± 6.85 vs. 63.7 ± 0.64) (P value < 0.001) after the rehabilitation treatment. A comparison of the two treatment methods between groups did not reveal any significant differences (P value > 0.05). Low-level laser therapy combined with therapeutic exercises was associated with a greater improvement in pain intensity and TENS combined with therapeutic exercise with a greater improvement in functionality.
Conclusion: Using low-level laser therapy and TENS in addition to therapeutic exercise for the treatment of partial rotator cuff tears appears to be equally effective in terms of pain relief and functional improvement.

P689
EVALUATION OF BONE MINERAL DENSITY OF TRANSGENDER WOMEN IN SOUTHERN BRAZIL

K. Chrisostomo[1], N. Sandrim[2], T. Skare[3], R. Nisihara[3]

[1]Federal Univ. of Paraná, [2]Catholic Univ. of Paraná, [3]Mackenzie Evangelical College of Paraná, Curitiba, Brazil

Objective: To evaluate BMD and body composition of Brazilian transwomen (TW) undergoing cross-sex hormone therapy (CSHT) for 3 y or more, comparing with control groups of cisgender women and cisgender men.
Methods:

- Cross-sectional observational study, through the collection of sociodemographic, epidemiological and clinical data

- Performing bone mineral densitometry and total body bone densitometry exams with the LUNAR PRODIGY ADVANCE DXA SYSTEM – Encore version 14.10, Radiation Corporation, Madison, WI. GE Healthcare dual beam system
- The study was carried out in the city of Curitiba, Paraná, Brazil from August 2018 to August 2019
- After recruitment and application of the inclusion and exclusion criteria, 31 TW treated at the Center for Research and Assistance for Transvestites and Transsexuals (CPATT) and at the Regional Specialties Center (CRE) of the Health Department of the state of Paraná agreed to participate in the study and signed the free and informed consent form
- Two control groups matched by age, BMI and lifestyle habits, with 31 cisgender women and 31 cisgender men, totaling 93 participants
- Data analyzed using the GraphPad Prism 6 program, San Diego, CA

Results:

- The BMD of TW is lower than that of matched groups; 12.9% of TW had low bone mass (Z score $\leq$ 2), this percentage was 3.2% for cisgender women and 3.3% for cisgender men
- TW had a lower Z-score, both for the spine (0.26 $\pm$ 1.42 vs. 0.50 $\pm$ 1.19) and the femur (-0.41 $\pm$ 0.95 vs. 0.29 $\pm$ 1.04) than cisgender women
- When compared to cisgender men, TW had a lower total femur Z-score (-0.41 $\pm$ 0.95 vs. 0.20 $\pm$ 0.83)
- Higher values of lean mass were positively correlated with total femoral BMD (p = 0.40; 95%CI = 0.009–0.68; p = 0.04) and femoral neck BMD (p = 0.48; 95%CI = 0.11–0.74; p = 0.01)
- Neither the type of therapy received nor its duration of use had any impact on bone mass

Conclusion: Low BMD is frequently found in TW and that this is related to lean body mass, which corroborates the need for more studies on the effects of hormonal therapy on the bones and muscles of TW.

P690
STUDY OF PEAK BONE MASS IN YOUNG HEALTHY ADULTS

K. E. Akhiiarova[1], R. I. Khusainova[2], A. V. Tyurin[1]

[1]Bashkir State Medical Univ., Internal Medicine Dept., [2]Bashkir State Medical Univ., Medical Genetics Dept., The National Endocrinology Research Centre, Laboratory of Genomic Medicine, Ufa, Moscow, Russia

Objective: Peak bone mass (PBM) is the amount of bone tissue that has been formed by the time of stable skeletal condition at a young age. The assessment of BMD in young people is of interest, since the reference values of BMD (aBMD), as well as their "normal" maximum (peak) values, are practically not described in the literature. PBM is an important predictor of the occurrence of primary osteoporosis. The purpose of this study was to analyze the values of aBMD in young people.
Methods: A single-stage noninvasive descriptive study was conducted among young healthy people (N = 84, male N = 10) without diseases and risk factors affecting bone metabolism. The mean age was 26.04 $\pm$ 1.34 y. aBMD was assessed in various parts of the body by X-ray absorptiometry with determination of absolute values (g/cm^2).
Results: At the first stage, gender groups were formed. The mean values of aBMD in men exceeded the values of women, since men tend to have a more massive skeleton. The greatest differences in aBMD in the groups of men and women were found for trunk aBMD (0.80 $\pm$ 0.01 vs. 1.09 $\pm$ 0.06) and lower extremities (1.04 $\pm$ 0.03 vs. 1.21 $\pm$ 0.04), but no statistical significance was achieved (Fig. 1). Further, aBMD was evaluated on the general sample. The analysis of aBMD in the general sample showed that the highest values were observed in the lower extremities (1.15 $\pm$ 0.02) and pelvis (1.08 $\pm$ 0.02), the lowest values in the upper extremities (0.86 $\pm$ 0.01), and the total aBMD in absolute values was 1.16 $\pm$ 0.01 g/cm^2. The value of the total aBMD for young men and women may correspond to PBM.

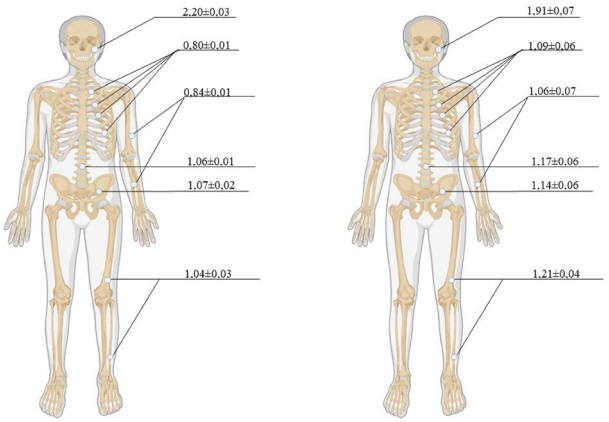


Figure 1. Distribution of aBMD values in men (right) and women (left) relative to body parts (g/cm^2)

Conclusion: The total aBMD in absolute values was 1.16 $\pm$ 0.01 g/cm^2, male – 1.30 $\pm$ 0.03, female –1.15 $\pm$ 0.01. The obtained values of total aBMD for young healthy men and women may correspond to peak values of bone mass.

P691
SIGNIFICANCE OF RECENT FRACTURE LOCATION FOR IMMINENT RISK OF HIP AND VERTEBRAL FRACTURES: A NATIONWIDE COHORT STUDY ON OLDER ADULTS IN SWEDEN

K. F. Axelsson[1], H. Litsne[2], M. Lorentzon[2]

[1]Geriatric Medicine, Institute of Medicine, Sahlgrenska Academy, Gothenburg Univ., Skövde, [2]Geriatric Medicine, Institute of Medicine, Sahlgrenska Academy, Gothenburg Univ., Mölndal, Sweden

Objective: Hip and vertebral fractures are the most serious in terms of associated morbidity, mortality, and societal costs. There is limited evidence as to which recent fracture sites are associated with the highest risk for subsequent hip and vertebral fractures. This study aimed to determine which recent index fracture sites are most strongly associated with imminent risk of hip and vertebral fracture.
Methods: Conducted as a nationwide retrospective cohort study, we utilized Swedish national registers to assess the risk of hip and vertebral fractures based on the site of the recent ($\leq$ 2 y) index fracture, and an old (> 2 y) prevalent fracture. This risk was compared to that observed in individuals without any prevalent fractures. This study encompassed all Swedes aged 50 years and older between 2007–2010, included in a previously collected cohort, used to investigate the association between recent fracture and risk of any fracture and major osteoporotic fracture (Axelsson et al. JBMR 2023). Patients with a recent fracture were categorized into specific groups based on the type of their previous fracture and were followed until December 2017, with censoring for death and migration. The study

assessed the risk of hip and vertebral fractures during the follow-up period.

Results: The study included a total of 3,423,320 individuals, comprising 145,780 with a recent fracture, 293,051 with an old fracture, and 2,984,489 without a previous fracture. The median follow-up times for the three groups were 7.6 y (IQR 4.0–9.1), 7.9 y (5.8–9.2), and 8.5 y (7.4–9.7), respectively. Patients with a recent fracture at all sites exhibited a significantly increased risk of vertebral fracture, whilst most (32 out of 36) index fracture sites were associated with an increased risk of hip fracture compared to controls (Figure).

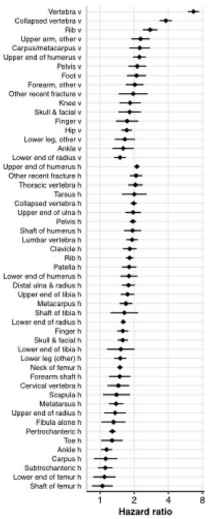


Figure. Risk of incident vertebral (top third) and hip (lower thirds) fracture. Adjusted hazard ratios per site of recent fracture (≤2 y), categorized in subgroups compared to patients with no previous fracture. The Cox model is adjusted for age, sex, inclusion year, osteoporosis medication, multiple recent fractures, and Charlson comorbidity index.

Conclusion: With a few exceptions, patients with recent fractures had an increased risk of subsequent hip and vertebral fractures independent of the index fracture site. These results strengthen the notion that all patients with a recent fracture, regardless of fracture site, should be included in secondary prevention programs, to improve the prevention of the clinically most serious fractures.

P692
GENDER DIFFERENCES FOR SARCOPENIA IN PATIENTS UNDERGOING TOTAL KNEE ARTHROPLASTY FOR ADVANCED KNEE OSTEOARTHRITIS

K. G. B. Kim[1], J. J. Y. Jung[2]

[1]Yeungnam Univ. College of Medicine, Daegu, [2]Gumi CHA Univ. Medical Center, Gumi, South Korea

Objective: To compare gender differences in the incidence of sarcopenia, demographic characteristics, and preoperative sarcopenic parameters in patients undergoing TKA for advanced knee osteoarthritis (OA). Moreover, we sought to compare patient-reported outcome measures (PROMs) and the predisposing factors after TKA in patients with sarcopenia by gender through subgroup analysis.

Methods: From May 2020 to September 2022, a total of 892 patients were enrolled in whom body composition, strength, and physical performance could be measured prior to primary TKA. Sarcopenia was defined according to the Asian Working Group for Sarcopenia 2019 criteria. Patients were assessed according to the presence or absence of sarcopenia. After a two-to-one matched pair analysis for subgroup analysis, 21 knees in male were matched with a corresponding number of knees in female (42), resulting in a total of 63 knees. PROMs were investigated using the Knee Injury and Osteoarthritis Outcome Score, Western Ontario and McMaster Universities Osteoarthritis Index, and the Short Form-12 physical and mental component summary scores. Moreover, postoperative complications and predisposing factors for male sarcopenia were investigated.

Results: The prevalence of sarcopenia was 10.9%, and the prevalence was higher in men (19.6%) than in women (9.7%). In subgroup analyses, male patients had significantly inferior PROMs up to 12 months after index surgery. Moreover, there was no significant difference in systemic complications between the two groups. Multivariate binary logistic regression analysis indicated that alcohol, smoking, and higher modified Charlson Comorbidity Index (mCCI) were predisposing factors for male patients with sarcopenia.

Conclusion: The prevalence of sarcopenia was higher in male patients undergoing primary TKA. When compared with the propensity-matched female group, male patients had inferior PROMs up to 12 months postoperatively. Alcohol, current smoker, and higher mCCI were predisposing factors for sarcopenia in male patients with advanced knee OA.

P693
SCREENING FOR SARCOPENIA AND SARCOPENIC OBESITY IN THE ORTHOPEDIC SURGERY CLINICAL SETTING: A PILOT STUDY

K. Godziuk[1], I. Hollyer[2], G. Loughran[2], N. Giori[2]

[1]Univ. of Alberta, Edmonton, Canada, [2]Stanford Univ., Palo Alto, USA

Objective: Sarcopenia [low strength with low muscle mass] and sarcopenic obesity (SO) [low strength, low muscle and higher fat mass] may increase surgical complications and impact recovery, function and quality of life after total joint arthroplasty (TJA). New consensus approaches for sarcopenia and SO identification are available. We assessed the feasibility of screening and identifying these conditions in orthopedic practice using published consensus criteria.

Methods: Individuals age > 40 y attending a lower extremity arthroplasty clinic were screened for sarcopenia using the EWGSOP2 criteria, or SO using the European Society for Clinical Nutrition and Metabolism and European Association for the Study of Obesity (ESPEN/EASO) criteria when BMI was ≥ 30 kg/m^2. Low strength + low muscle were required for identification of sarcopenia and SO. Strength screening involved maximal handgrip in one hand (HGS) and number of chair sit-to-stands in 30 s (CSTS). Low HGS [< 20 kg in females (F) or < 30 kg in males (M)] or low CSTS [< 10] defined low strength. Low strength patients were referred for same-day DXA assessment of appendicular lean soft tissue (ALST). Low muscle was confirmed by low ALST/height^2 [< 5.45 m^2 F, < 7.26 m^2 M] for sarcopenia or low ALST/weight [$< 19.4\%$ F, $< 25.7\%$ M] for SO.

Results: N = 101 patients (93% male, mean age 69.6 ± 8.9 y, BMI 31.7 ± 7.9 kg/m^2) were screened Dec2022-Feb2023. HGS was completed in 99% of patients (1 had cervical compression impacting grip). 44.5% completed CSTS (non-completion due to joint pain = 36, inability to stand without hands = 6, imbalance = 7, vertigo/hypotension = 3, stiffness = 1, other = 3). 39 patients had low strength (low HGS = 30, CSTS = 17, both HGS + CSTS = 8) and were recommended for DXA; 17 agreed (completed = 16, DXA unavailable = 1) and 22 declined (unable to stay = 15, uninterested = 7). In 16 patients with complete screening, 3 had sarcopenia and 5 had SO.

Conclusion: Low strength assessment was feasible using HGS but not CSTS, supporting that alternatives for low strength assessment are

needed in orthopedic patients. DXA completion was limited by same-day appointments, impacting screening uptake. In patients with complete screening, 50% had sarcopenia or sarcopenic obesity. Future work should identify the cost-effectiveness of screening and whether interventions for sarcopenia or sarcopenic obesity can improve TJA outcomes.

P694
FEASIBILITY, ACCEPTABILITY, AND EFFECTIVENESS OF THE POMELO [PREVENTION OF MUSCLE LOSS IN OSTEOARTHRITIS] PROGRAM FOR INDIVIDUALS WITH OBESITY

K. Godziuk[1], F. Vieira[1], J. Mota[2], J. Werle[3], M. Forhan[4], C. Prado[1]

[1]Univ. of Alberta, Edmonton, Canada, [2]Federal Univ. of Goias, Goias, Brazil, [3]Univ. of Calgary, Calgary, Canada, [4]Univ. of Toronto, Toronto, Canada

Objective: Improving physical function and body composition [i.e., preserving muscle while reducing fat mass] should be prioritized in adults with osteoarthritis (OA) and obesity to prevent functional decline. We examined the feasibility, acceptability, and effectiveness of a multimodal weight-neutral behavioural intervention to improve these factors in a pilot trial of adults aged $\geq$ 40 with advanced knee OA and BMI $\geq$ 35 kg/m^2.
Methods: Prevention Of MusclE Loss in Osteoarthritis [POMELO] is a two-arm pilot randomized trial conducted September 2021-July 2023 (clinical trials.gov identifier NCT05026385). Participants were randomized 1:1 to receive usual care (UC), following clinical care standards, or POMELO intervention. POMELO was a 3-month personalized program of supervised progressive whole-body resistance exercise (3x/week), a nutrition consultation, and 12-weekly group education sessions on nutrition and arthritis self-management, followed by 6-months of unsupervised maintenance. Assessments included DXA [fat mass, appendicular lean soft tissue (ALST)], strength and physical function [maximal handgrip (HGS), 6-min walk (6MWT), 30-s chair-sit-to-stand (CSTS)], and health-related quality of life [EQ-5D VAS] at baseline and 9-months. Feasibility was determined by intervention completion $\geq$ 80% and adherence $\geq$ 60% (i.e., attendance at 12-sessions, exercise 3x/week). Acceptability was assessed with a 4-point Likert-scale satisfaction survey.
Results: 32 individuals completed the study (16/group), 69% female, mean age of 64.9 $\pm$ 1.2 y, and BMI 42.1 $\pm$ 1.0 kg/m^2. POMELO completion was 80% with 70% adherence and no adverse events. Higher satisfaction rates in POMELO vs. UC (3.4 vs. 2.2, $p < 0.001$) indicated acceptability. POMELO was more effective in improving 6MWT, CSTS, and HGS compared to UC ($p = 0.05, < 0.001, 0.02$, respectively), and shows promise to improve ALST and quality of life ($p = 0.19, 0.15$, respectively).
Conclusion: The personalized multimodal POMELO intervention may confer greater positive impacts on patients' mobility and health compared to usual care for advanced knee OA. A larger study is needed to confirm findings.
Acknowledgements:
This research is funded by the Arthritis Society Canada SOG-20-0033.

P695
USING ADDITIONAL STABILIZATION METHODS OF MEDIAL MENISCUS EXTRUSION CAUSED BY MEDIAL MENISCUS ROOT TEAR

O. Buryanov[1], K. Honchar[2]

[1]Bogomolets National Medical Univ., Dept. of traumatology and orthopedics, [2]Bogomolets National Medical Univ., Kyiv, Ukraine

Objective: Extrusion of the medial meniscus is a common problem in arthroscopic operations for medial meniscal root tears. Numerous surgical techniques permit the restoration of the anatomical position of the medial meniscus root, however, without supplementary fixation of the meniscus, they do not permit the reduction of extrusion. The aim of the study is to evaluate the results of treatment for patients with medial meniscus root and extrusion using additional methods of meniscus stabilization.
Methods: 20 patients with medial meniscal root tears were included. The diagnosis was confirmed by an MRI. Patients were divided into 2 groups. The main group included patients with suture of the medial meniscus root with using additional stabilization suture under arthroscopic control (n = 10), and the comparison group—suture of medial meniscus root without using additional stabilization methods (n = 10). Meniscal extrusion was assessed by MRI before the operation and 6 months after surgery.
Results: The extrusion of the medial meniscus in the main group and the comparison group was evaluated by preoperative MRI. The average value of extrusion distance before surgery was obtained 4.4 $\pm$ 0.6 mm ($p < 0,05$) for main and comparison groups. Patients in the main group underwent meniscal root repair surgery with an anatomic transtibial tunnel pullout technique with peripheral stabilization suture through an additional transtibial tunnel at the apex of the posterior horn under arthroscopic control. Patients in the control group were performed meniscal root repair surgery with an anatomic transtibial tunnel pullout technique under arthroscopic control. 6 months after surgery, the extrusion distance of the main group was 2.6 $\pm$ 0.4 mm and 3.5 $\pm$ 0.4 mm ($p < 0.05$) of the comparison group.
Conclusion: The additional stabilization methods for medial meniscal extrusion associated with medial meniscus root tear improved the results of treat extrusion distance of medial meniscus. This method may help prevent additional extrusion of the meniscal tissue outside the joint.

P696
ENHANCED ANALGESIC EFFICACY OF PREEMPTIVE LOW-DOSE KETOROLAC VERSUS PARECOXIB FOLLOWING TOTAL KNEE ARTHROPLASTY: A RETROSPECTIVE PROPENSITY SCORE MATCHING STUDY

K. Iamthanaporn[1], N. Rojjanasirisawat[1], V. Yuenyongviwat[1]

[1]Dept. of Orthopedics, Faculty of Medicine, Prince of Songkla Univ., Songkhla, Thailand

Objective: Total knee arthroplasty (TKA) commonly induces substantial postoperative pain necessitating effective management for optimal recovery. NSAIDs are frequently employed, but the choice of NSAID and dosing regimen significantly influences outcomes.

Methods: This retrospective cohort study, conducted from January 2016 to December 2020, scrutinized TKA patients segregated into two groups: those administered preemptive low-dose ketorolac (15 mg, followed by 15 mg every 6 h for 48 h) and those given parecoxib (40 mg every 12 h for 48 h). Pain scores, opioid consumption, and adverse events were evaluated.
Results: Ketorolac exhibited superiority over parecoxib, with markedly lower Visual Numeric Rating Scale (VNRS) scores reported at 8 and 20 h post-surgery. Linear mixed models affirmed this advantage ($p = 0.0084$). Ketorolac also correlated with diminished opioid usage in the initial 24 h. Importantly, adverse event rates were comparable.
Conclusion: Preemptive low-dose ketorolac emerges as a promising strategy for augmenting pain control within the initial 24 h post-TKA, potentially mitigating opioid requirements. Further investigations are warranted to comprehensively assess its sustained analgesic effects and safety profiles across diverse surgical scenarios, offering crucial insights for refining pain management strategies.

P697
MICRORNA ANALYSIS TO DERIVE FACTORS ASSOCIATED WITH BISOPHOSPHONATE FAILURE AMONG STROKE PATIENTS

K. J. M. Kim[1], P. K. Y. Park[2], H. R. K. Kim[2]

[1]Seoul National Univ. Hospital, [2]Chung-Ang Univ. Hospital, Seoul, South Korea

Objective: Bisphosphonate is one of the most common therapeutics for osteoporosis. We tried to find out prognostic factors related with treatment outcome among the stroke patients with osteoporosis by analyzing microRNA signature from venous blood.
Methods: Acute cerebral infarction patients with osteoporosis was eligible to be included between December 2020 and March 2023. We obtained 5 mL of venous blood after informed consent for the microRNA analysis. All the patients received intravenous zoledronate and treatment response was followed after 12 months by DXA. Demographic and laboratory data were compared between the patients with and without BMD improvement. Next generation small RNA sequencing will be performed to derive a set of microRNA which can predict treatment response.
Results: A total of 20 stroke patients were included, with mean age of 78.1 ± 7.4 y and 14 female patients. Combined medical condition included hypertension in 13 patients, atrial fibrillation in 4 patients and diabetes mellitus in 2 patients. While seven patients were lost to follow up, 7 patients showed improvement, but 6 patients were deteriorated according to the followed BMD 12 months after zoledronate treatment. Osteoporotic fracture event was not detected during follow up period, but two patients experienced recurrent stroke. The expression signature of microRNAs will be presented in the conference.
Conclusion: This study can help to derive molecular signature to predict bisphosphonate treatment among stroke patients.

P698
PEOPLE WITH DISABILITIES ARE AT RISK OF OSTEOPOROTIC FRACTURE: A POPULATION-BASED STUDY IN SOUTH KOREA

C. Hyunjeong[1], K. So Young[2], P. Jong Eun[2], P. Jong-Hyock[3], K. Ji Hyoun[1]

[1]Dept. of Internal medicine, Chungbuk National Univ. Hospital, [2]Dept. of Public Health and Preventive Medicine, Chungbuk National Univ. Hospital, [3]Institute of Health & Science Convergence, Chungbuk National Univ., Cheongju-si, South Korea

Objective: This study aims to examine of the incidence and type for osteoporotic fractures compared to individuals without disabilities.
Methods: Using national disability registration data and National Health Insurance claims data, we analyze incidence of osteoporotic fracture from 2008–2017. The types of osteoporotic fractures in disabled and non-disabled individuals were also investigated.
Results: The age-standard incident rate (ASIR) of osteoporotic fractures was higher in disabled individuals compared to those without disabilities over a period of 10 y. Although vertebral fractures had the highest incidence, the distribution rate of non-vertebral fractures was also higher in disabled individuals compared to non-disabled ones. In a multivariate logistic regression analysis, the highest odds ratios (OR) for males were observed for epilepsy (OR: 3.80, 95%CI 2.40–5.99), respiratory disease (OR 2.38), and intellectual disability (OR 1.95). For females, the highest ORs were found for epilepsy (OR 3.19), liver disease (OR 1.64), and respiratory disease (OR 1.49).

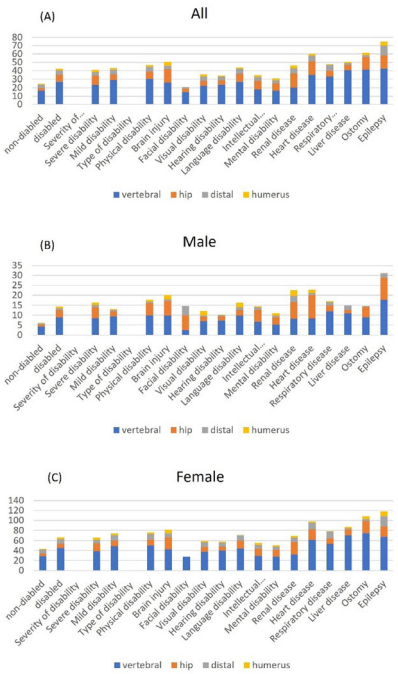


Figure. Distribution of fracture type depending on type of disabilities and sex by age-standardized incidence rate (ASIR) per 10,000 persons. The blue bar represents a vertebral fracture, the orange bar represents a hip fracture, the gray bar represents a distal fracture, and the yellow bar represents a humerus fracture.

Conclusion: The incidence of osteoporotic fracture in people with disabilities is higher than in people without disabilities. The rate of non-vertebral fractures in disabled people was higher compared to non-disabled people. The risk of osteoporotic fracture is highest in individuals with epilepsy.

P699
INCIDENCE RATE AND CHARACTERISTICS OF FALLS IN IRANIAN OLDER ADULTS: THE PROSPECTIVE FOLLOW-UP OF THE PARTICIPANTS IN THE IRANIAN MULTICENTER OSTEOPOROSIS STUDY (IMOS), 2021–2022

V. Mohseni[1], K. Khalagi[2], M. Ahmadi[1], N. Fahimfar[1], M. Sanjari[1], M. J. Mansourzadeh[1], F. Hajivalizadeh[3], S. Hajivalizadeh[1], E. Hesari[1], A. Ostovar[4]

[1]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [2]Obesity and Eating Habits Research Center, Endocrinology and Metabolism Molecular -Cellular Sciences Institute, Tehran Univ. of Medical Sciences, [3]Center for Non-Communicable Disease Control & Prevention, Deputy of Public Health, Ministry of Health and Medical Education, [4]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Falling is the primary cause of osteoporotic fractures in older adults. Understanding the incidence rate and consequences of falls among this demographic is essential for comprehensive healthcare planning. This study aimed to estimate the incidence rate and characteristics of falls among older adults aged $\geq$ 50 in Iran.
Methods: The study included 1416 participants from the 4th national IMOS survey, who were followed up for a median duration of 1.8 y. Comprehensive data on falls were collected, including frequency of falls, post-fall medical consultations, outpatient and inpatient visits, causes of falls categorized by age-related and environmental factors, fall sites, and the presence of post-fall fear. Post-fall complications were also assessed.
Results: The mean (SD) age of the participants was 61.25 (7.88) y, with 773 (54.6%) being women. Over the follow-up period, 261 falls were recorded, with 95 individuals (35.85%) seeking medical attention. The incidence rate (95%CI) of falling in the whole population, women, men, those $<$ 65 years old, and those $\geq$ 65 y were estimated as 14.08% (95%CI: 12.47–15.90), 16.90% (95%CI: 14.53–19.65), 10.78% (95%CI: 8.79–13.23), 14.5% (95%CI: 12.56–16.74), and 13.13% (95%CI: 10.45–16.49), respectively. Additionally, 23 falls (8.7%) resulted in hospitalization. Age-related causes, including gait disorders, vertigo, weakness, and low blood pressure, contributed to 144 (54.3%) falls. Environmental factors, such as slippery floors, improper home arrangements, and city infrastructure issues, were linked to 86 (32.4%) falls. The combination of both factors led to 33 (12.4%) falls. Furthermore, 46.79% of falls occurred inside the house, with yards being the most common location, followed by the kitchen and stairs. Outside the house, streets were the primary fall sites, along with parks and other covered areas. Notably, 153 individuals (57.7%) developed a fear of falling after their initial incidence, and 199 (75.1%) patients experienced post-fall complications, including bruising, scratches, ligament strains, and fractures.
Conclusion: Addressing both age-related and environmental factors is crucial for effective fall prevention strategies, considering the associated healthcare utilization, the development of post-fall fear, and the occurrence of post-fall complications. These findings underscore the importance of tailored interventions and public health initiatives to mitigate the impact of falls in the aging population.

P700
DEVELOPMENT OF SIMPLE ASSESSMENT TOOL FOR FRACTURE ESTIMATION IN KOREAN ELDERLY WOMEN (SAFE) TO PREDICT IMMINENT RISK OF FRACTURES IN KOREAN ELDERLY WOMEN

S. Y. Park[1], S. Sujin[2], K. J. Kim[3], S. H. Ahn[4], K. M. Kim[2]

[1]Division of Endocrinology and Metabolism, Dept. of Internal Medicine, Kyung Hee Univ. College of Medicine, Seoul, [2]Dept. of Endocrinology, Yongin Severance Hospital, Yonsei Univ. College of Medicine, Yongin, [3]Division of Endocrinology and Metabolism, Dept. of Internal Medicine, Korea Univ. College of Medicine, Seoul, [4]Division of Endocrinology and Metabolism, Dept. of Internal Medicine, Inha Univ. School of Medicine, Incheon, South Korea

Objective: Previously developed fracture risk prediction models have limitations in applying them to clinical practice. In this study, we developed more simplified and convenient fracture risk prediction model in Korean elderly women.
Methods: A total of 1,440,988 women who underwent 66-year-old life changing national examination in 2011–2017 were included and followed for 3 y. Incidence of major osteoporotic fracture (MOF) and hip fracture in 1 y or 3 y were analyzed. Clinical risk factors such as age, BMI, BMD, history of fall within 6 months, past fracture within 3 y, recent fracture within 1 y, and recurrent fracture were collected. Multivariate logistic regression analysis was used to calculate the odds ratio (OR) of each risk factor for osteoporotic fracture. A new fracture prediction score for MOF and hip fracture was developed; Simple Assessment tool for Fracture Estimation, SAFE.
Results: Scores were calculated using the OR of each risk factor for osteoporotic fracture According to the sum of the scores, it was classified into 6 groups; 0–3, 4–6, 7–9, 10–12, 13–15, and 16–18 score. The higher the score, the higher the risk of 1-y and 3-y MOF and hip fracture. The 3-y MOF and hip fracture was 5% and 0.2% (0–3 score), 5% and 0.2% (4–6 score), 9% and 0.4% in 7–9 score, 17% and 0.8% in 10–12 score, 30% and 0.8% in 13–15 score, 35% and 2.2% in 16–18 score. The 1-y MOF and hip fracture was 2% and 0% (0–3 score), 2% and 0.1% (4–6 score), 4% and 0.2% in 7–9 score, 8% and 0.3% in 10–12 score, 13% and 0.4% in 13–15 score, 16% and 0.8% in 16–18 score.
Conclusion: SAFE can predict well the imminent fracture risks, which could happen within 1 or 3 y.

P701
USE OF COMBINATION OF TERIPARATIDE AND DENOSUMAB IN THE TREATMENT OF OSTEOPOROSIS: EXPERIENCE FROM AN IRISH SPECIALIST BONE HEALTH CLINIC

L. A. Ali[1], K. M. Mccarroll[1], R. L. Lannon[1], N. M. Maher[1], N. F. Fallon[2], J. C. Carraher[1], D. F. Fitzpatrick[1]

[1]Mercer's Institute for Research and Ageing, St James's Hospital, Dublin, Ireland

Objective: The combination of denosumab and teriparatide has been demonstrated to increase BMD of both the hip and spine more than either drug alone, though data on antifracture efficacy is lacking. Combination therapy is not common practice and there is a lack of

clear guidance on its use. In this study, we explore our experience with combination therapy at our bone health clinic.

Methods: This was a retrospective review of patients attending our bone health clinic over the last six years who were commenced on dual therapy with denosumab and teriparatide, either simultaneously, or else were being treated with denosumab and teriparatide was subsequently added. We evaluated the characteristics of these patients including their fracture history and bone densitometry (DXA).

Results: There were 33 patients with a mean age of 76 ± 8 y and 32 were female. Teriparatide and denosumab were commenced simultaneously in 52% (n = 17) while in the remainder, teriparatide was added in patients already established on denosumab (median duration of 55 (IQR 15–87) months). For those started on simultaneous combination therapy, 94% had a previous vertebral fracture, 71% a T-score < -3.0 at the hip or neck of femur and one a hip fracture. In patients were teriparatide was added, 75% (12/16) had vertebral fracture(s) when on denosumab and 25% (5/16) a deterioration in lumbar spine BMD on therapy. Patients started on simultaneous combination therapy vs. those where teriparatide was added in were more likely to have lower T-scores in the spine (P = 0.040) and total hip (P = 0.02).

Conclusion: Patients started on denosumab and teriparatide simultaneously at our clinic had severe osteoporosis of the spine and generally hip T-scores < -3.0. Vertebral fractures on denosumab therapy was the main reason for adding in teriparatide. Current guidelines do not yet provide recommendations on the use of combination therapy, though in patients at high risk of both hip and vertebral fractures, it may be a good option. For patients on denosumab with no improvement in bone density or recurrent vertebral fractures, the addition of teriparatide also may be beneficial though studies are needed to investigate this.

P702
ORAL HEALTH QUALITY OF LIFE IN PATIENTS UNDER BISPHOSPHONATES TREATMENT FOR OSTEOPOROSIS

W. Lahmar[1], K. Maatallah[1], H. Ferjani[1], F. Majdoub[1], L. Kharrat[1], D. Ben Nessib[1], D. Kaffel[1], W. Hamdi[1]

[1]Kassab's Institute of Orthopedics, Manouba, Tunisia

Objective: Bisphosphonates (BPs) stand as the most widely prescribed antiresorptive drugs for the treatment of osteoporosis. There is consensus among guidelines that a thorough oral evaluation is recommended prior to initiating bisphosphonate therapy, and treating any existing dental health problems before starting the BPs. The aim of the study was to investigate the oral health impact on quality of life for those patients who underwent dental therapy before starting the BP for osteoporosis.

Methods: A monocentric cross-sectional study including osteoporosis patients treated with BP. Sociodemographic and clinical characteristics were collected. The dentistry treatment was assessed. The impact that oral health problems can have on an individual's life was measured using the Oral Health Impact Profile-14 (OHIP-14). The answers were recorded on a Likert scale with values ranging from 0 to 4 coded as 0 "never" to 4 "very often". The OHIP-14 sum score can range from 0 to 56 with a higher score indicating poorer quality of life [25]. The 14 items can be grouped into 7 subdomains: 1) functional limitation (items 1 and 2), 2) handicap (3 and 10), 3) psychological disability (4 and 11), 4) psychological discomfort (5 and 14), 5) physical disability (6 and 12), 6) physical pain (7 and 13), and 7) social disability (8 and 9).

Results: We enrolled 100 patients, predominantly women (87%), with a mean age of 66 y ± 7.7 [42–85]. Of these, 29% had a rheumatic disease, and 17 were on regular steroid intake. The mean BMI was 28.3 kg/m^2. Twenty-nine patients had major osteoporotic fractures. The mean BMD in the vertebral site was 0.781 g/cm^2 ± 0.09 [0.563–0.922] and in the femoral site 0.580 g/cm^2 ± 0.8 [0.016–1.150]. The prescribed bisphosphonates were alendronate (46 cases), risedronate (43 cases), and zoledronate (11 cases), with 89 cases involving oral administration. Most patients were prescribed bisphosphonates for postmenopausal osteoporosis (n = 89). Following the initial dental evaluation, 88 patients received dental care, including extractions in 46 cases (6 resulting in edentulism), root canal treatment in 7 cases, dental fillings in 4 cases, dental cleaning in 45 cases, and prosthodontic treatment in 9 cases, including 4 with implants. The OHIP-14 scores were assessed, with a total mean score of 33.06 ± 14.55 [14–54]. Mean subdomain scores were as follows: functional limitations:3 [2–9], handicap 5 [2–10], social disability:5.11 ± 3.19 [2–17], physical pain: 4.83 ± 2.61 [2–9], physical disability: 4.83 ± 2.61 [2–10], and psychological disability: 4.9 ± 2.16 [2–10]. The age of disease onset showed a negative correlation with the overall OHIP-14 score (r: -0.302, p = 0.010), as well as with social disability (r: -0.318, p = 0.004), and psychological disability (r = -0.364, p = 0.001). Serum creatinine levels demonstrated a positive correlation with the overall OHIP-14 score (r: 0.253, p = 0.044), as well as with social disability (r: 0.310, p = 0.009), physical pain (r: 0.254, p = 0.032), and physical disability (r: 0.275, p = 0.020) subdomains. Patients who experienced major osteoporotic fractures and those with rheumatic diseases had higher mean scores in both the total OHIP-14 ($p < 10^{-3}$) and the functional limitations subdomain ($p < 10^{-3}$).

Conclusion: Our study highlights the impact of oral health on the quality of life in osteoporosis patients undergoing BP therapy. The negative correlation of disease onset age with oral health-related quality of life emphasizes the importance of early intervention. Additionally, the positive association between serum creatinine levels, severe osteoporosis, a rheumatic disease, and dental implications suggests the necessity for more evaluations in the management of osteoporosis.

P703
DELAY IN BISPHOSPHONATE TREATMENT INITIATION: INFLUENCE OF INITIAL DENTAL INTERVENTIONS IN OSTEOPOROSIS PATIENTS

K. Maatallah[1], W. Lahmar[1], H. Ferjani[1], F. Majdoub[1], D. Ben Nessib[1], L. Kharrat[1], D. Kaffel[1], W. Hamdi[1]

[1]Kassab's Institute of Orthopedics, Manouba, Tunisia

Objective: Osteoporosis has emerged as a major health problem for middle-aged and older individuals, with bisphosphonates (BP) being the primary antiresorptive drugs prescribed for its treatment. Consensus guidelines emphasize the importance of a thorough oral assessment before initiating BP therapy, recommending the resolution of any dental issues beforehand. However, the potential delay in bisphosphonate initiation resulting from this evaluation and dental treatment raises a critical question in clinical practice. We aimed to assess the delay in bisphosphonate (BP) treatment initiation and determine whether such delays are attributable to underlying dental issues.

Methods: A retrospective study involving patients diagnosed with osteoporosis and prescribed BP. Relevant demographic and clinical data, and baseline BMD) using DXA, were extracted. The BP delay was defined as the time interval between diagnosis and treatment decision and initiation of BP treatment. Dental interventions preceding bisphosphonate therapy were assessed, and the delay of dental treatment was calculated.

Results: We enrolled 100 patients with a sex ratio (F/M) of 8.09 and a mean age of 66 y ± 7.7 [42–85]. The reasons for BP prescription

were postmenopausal osteoporosis in 89 cases and senile osteoporosis in 11. The mean BMI was 28.3 kg/m^2. 29 patients had major osteoporotic fractures. Mean BMD in the vertebral site was 0.781 g/cm^2 ± 0.09 [0.563–0.922], and in the femoral site 0.580 g/cm^2 ± 0.8 [0.016–1.150]. The prescribed bisphosphonates were alendronate (46 cases), risedronate (43 cases), and zoledronate (11 cases). In 89 cases, the BP was taken orally. Mean delay in BP initiation was 10.30 ± 14.5 [0–96] months. Following the initial assessment before starting BP therapy, 88 patients underwent dental interventions. These included 46 cases of extractions (resulting in edentulism in 6 cases), 7 cases of root canal treatment, 4 cases of dental fillings, 45 cases of dental cleaning, and 9 cases of prosthodontic treatment, including 4 with implants. The mean duration of dental treatment was 7.01 ± 4.27 months [1–24 months]. A positive correlation between BP delay and the duration of dental treatment (r: 0.743, $p < 10^{-3}$) was found.

Conclusion: While consensus guidelines recommend an oral assessment before initiating BP therapy, our study highlights a long treatment delay resulting from the preceding dental treatment. We emphasize the need for a balanced approach in clinical decision-making, ensuring timely osteoporosis management without compromising oral health considerations.

P704
PATIENT AWARENESS OF THERAPEUTIC AND ADVERSE EFFECTS OF BISPHOSPHONATES

K. Maatallah[1], S. Loukil[1], H. Ferjani[1], F. Majdoub[1], D. Ben Nessib[1], L. Kharrat[1], D. Kaffel[1], W. Hamdi[1]

[1]Rheumatology Dept. of Mohamed Kassab Institute, Tunis, Tunisia

Objective: To assess the level of awareness and understanding among osteoporosis patients regarding therapeutic benefits and potential adverse effects associated with bisphosphonates.

Methods: We conducted a cross-sectional survey involving patients receiving bisphosphonates(BP), recruited from the rheumatology department of Mohamed Kassab Institute. Sociodemographic data and disease-related characteristics were transcribed (educational background, treatment modalities, duration of the therapy, and treatment compliance). Patients were queried about their knowledge of the therapeutic impact of BP, as well as their awareness of the common and rare possible adverse effects.

Results: The study included 100 patients undergoing bisphosphonate therapy, with a female predominance (sex ratio M/F = 0.15). The mean age was 66 ± 7.7y. Socioeconomic status was classified as good for 13 patients, average for 63, and poor for 22. Regarding education qualification, the distribution was as follows: College degree or above 5%, high school diploma 15%, less than high school 41% and illiteracy 39%. The most frequent reason justifying BP prescription was postmenopausal osteoporosis (87%). The mean disease duration was 10 ± 6 years. A total of 89 patients were using oral BP and 11 received intravenous (IV) BP. Oral alendronate was the most commonly used BP (N = 46), followed by oral risedronate (N = 43). The mean duration of treatment was 29 ± 19 months. The majority of patients reported good compliance with their treatment (83%). Among the surveyed participants, 40% reported a good awareness regarding the therapeutic benefits of BP in reducing fracture risk and improving BMD. Regarding adverse effects, 69% of the participants lacked sufficient knowledge about common adverse effects such as gastrointestinal symptoms, and only 36% were familiar with rare adverse reactions associated with BP, such as osteonecrosis of the jaw or ulcers (3.5%). Several factors influencing awareness levels were identified, including educational level (P = 0.019), socioeconomic level (P = 0.02), and disease duration (P = 0.046). Treatment adherence was significantly associated with poor awareness levels regarding the adverse effects of BP(P = 0.027).

Conclusion: Our study revealed a significant gap in patient knowledge about the therapeutic and adverse effects of their medication with bisphosphonates. Healthcare providers should prioritize comprehensive discussions with patients to enhance understanding of treatment benefits, and promote better awareness about potential side effects.

P705
BISPHOSPHONATE ROTATION PATTERNS AND DISCONTINUATION CAUSES IN OSTEOPOROSIS MANAGEMENT

W. Lahmar[1], K. Maatallah[1], H. Ferjani[1], F. Majdoub[1], D. Ben Nessib[1], L. Kharrat[1], D. Kaffel[1], W. Hamdi[1]

[1]Kassab's Institute of Orthopedics, Manouba, Tunisia

Objective: Given the chronic nature of osteoporosis and the aging population, prolonged treatment of osteoporosis may be necessary, involving the successive use of various anti-osteoporotic treatments. We aimed to determine the rotation of bisphosphonates (BP) patterns in osteoporosis patients and the causes of BP treatment discontinuation.

Methods: It's a retrospective study involving patients diagnosed with osteoporosis and prescribed BP. Relevant demographic, clinical data and baseline BMD, using DXA, were extracted. Chosen molecules of BPs, doses, treatment duration, and causes of discontinuation were collected.

Results: We included 100 patients with a female-to-male sex ratio of 8.09 and an average age of 66 y ± 7.7 [42–85]. BP were prescribed for postmenopausal osteoporosis in 89 cases and senile osteoporosis in 11 cases. The mean BMI was 28.3 kg/m^2. Among them, 29 patients had major osteoporotic fractures. The mean BMD in the vertebral site was 0.781 g/cm^2 ± 0.09 [0.563–0.922], and in the femoral site, it was 0.580 g/cm^2 ± 0.8 [0.016–1.150]. The initially prescribed BP were alendronate (46 cases) at 70 mg/week, risedronate at 35 mg/week orally (43 cases), and zoledronic acid infusions of 5 mg/y (11 cases). The mean duration of bisphosphonate treatment was 28.81 months ± 19.23 [1–60] in the first sequence. 17 patients experienced a rotation of BPs after the first treatment sequence, with zoledronic acid being the most common (65% vs. 35% alendronate or risedronate, p = 0.046). The initial choice of BP was not associated with a specific rotation or second choice (p = 0.191). The second sequence of BP treatment had a mean duration of 14.93 months ± 10.10 [5–48]. The increase in BMD after BP rotation showed no significant difference between oral and intravenous (IV) BP in the lumbar site (oralBP: 0.807 g/cm^2 vs. IV.BP: 0.789,p = 0.070), and in the femoral site (oralBP:0.679 g/cm^2 vs. IV.BP: 0.770 g/cm^2,p = 0.809). Causes of discontinuation of the first sequence included adverse effects in 4 cases, treatment failure (vertebral fracture in 5 cases, peripheral fracture in 1 case), and patient-decided inefficacy in 1 case.

Conclusion: Our study revealed a notable occurrence of BP rotation in osteoporosis patients, zoledronic acid being the prevalent second choice. The duration of initial treatment and the specific BP chosen initially did not predict subsequent rotation patterns. Discontinuation reasons varied and were essentially failure of the first sequence.

P706
IMPACT OF BISPHOSPHONATE MOLECULES ON BONE DENSITY

K. Maatallah[1], M. Gdaiem[1], H. Ferjani[1], F. Majdoub[1], D. Ben Nessib[1], L. Kharrat[1], D. Kaffel[1], W. Hamdi[1]

[1]Dept. of Rheumatology, Mannouba, Tunisia

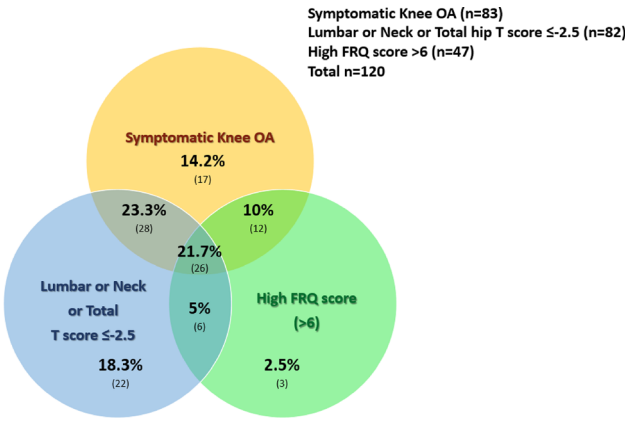
Objective: To determine the impact of bisphosphonate molecules on bone density.
Methods: A cross-sectional comparative study was conducted on patients with osteoporosis. Based on the type of bisphosphonate prescribed, we categorized the study population into three groups. DXA was used to assess BMD at the lumbar spine (L2–L4) and femoral site. The vertebral fracture incidence was assessed.
Results: A total of 100 patients (sex ratio = 0.15) were included. The average age was 66 y ± 7.7. Patients were stratified into 3 groups: risedronate (35 mg/week) (n = 43), alendronate (70 mg/week) (n = 46), and zoledronate (5 mg/y) (n = 11). The mean initial BMD value for the risedronate group at the vertebral site was 0.819 ± 0.593 g/cm^2, and at the femoral site was 0.735 ± 0.215 g/cm^2. The average risedronate intake was 32.87 ± 20.42 months. In the post treatment assessment, the mean BMD at the vertebral site was 0.890 ± 0.96 g/cm^2, with a corresponding femoral site BMD of 0.801 ± 0.22 g/cm^2 (p = 0,07). No new fractures were observed in this group. In the alendronate group, the mean initial values were 0.782 ± 0.862 g/cm^2 at the vertebral site and 0.581 ± 0.902 g/cm^2 at the femoral site. The average duration of alendronate intake was 28.38 ± 18.28 months. In the post treatment assessment, the mean BMD was 0.788 ± 0.93 g/cm^2 at the vertebral site and 0.659 ± 0.154 g/cm^2 at the femoral site (p = 0,2) One patient experienced new vertebral fractures (treatment duration of 10 months). In the zoledronate group, the initial BMD values were 0.623 ± 0.584 g/cm^2 at the vertebral site and 0.623 ± 0.584 g/cm^2 at the femoral site. The average duration of zoledronate intake was 15.36 ± 11.9 months. In the post-treatment assessment, BMD was 0.635 ± 0.01 g/cm^2 at the vertebral site and 0.601 ± 0.215 g/cm^2 at the femoral site (-0.022 g/cm^2) (p = 0.03). New vertebral fractures occurred in 3 patients (treatment duration of 8 ± 1,2 months).
Conclusion: Only zoledronate was associated with bone loss. However, further investigations are crucial in assessing the long-term effects of each specific bisphosphonate.

P707
EVALUATING OSTEOARTHRITIS AND BONE MINERAL DENSITY IN ELDERLY HIP FRACTURE PATIENTS

K. Mekariya[1], N. Adulkasem[1], E. Vanitcharoenkul[1], P. Chotiyarnwong[1], A. Unnanuntana[1]

[1]Dept. of Orthopaedic Surgery, Faculty of Medicine Siriraj Hospital, Mahidol Univ., Bangkok, Thailand

Objective: Osteoarthritis (OA) of the knee and osteoporosis are common yet manageable degenerative conditions that significantly impact patient mobility and balance, increasing the risk of falls and subsequent fragility fractures. However, the specific prevalence of knee OA and the BMD of the contralateral hip or lumbar spine in patients with fragility hip fractures (FHFs) is currently unknown. This study aimed to establish the prevalence of symptomatic knee osteoarthritis (SKOA) and its impact on BMD in the lumbar spine and contralateral hip among elderly FHF patients.
Methods: A cross-sectional analysis was performed on FHF patients treated surgically between January 2020 and May 2023. Diagnosis of knee OA followed the American College of Rheumatology criteria, with severity assessed via the Kellgren–Lawrence (KL) classification. SKOA was defined as FHF patients exhibiting knee OA of KL grade II or higher with substantial knee pain (visual analogue scale pain score of > 2/10 for more than 2 months) or gross instability. BMD at the lumbar spine and contralateral hip was measured using DXA scans. Fall risks were quantified using a self-rated questionnaire.
Results: Among 162 FHF patients (mean age 79.9 ± 8.1 y, 80.2% female), 66% had SKOA, correlating with increased multiple fall rates (p = 0.013) and fall risk (p = 0.020). Notably, 26.5% of SKOA patients were in end-stage knee OA (KL IV). Of 120 patients with BMD data, 68% exhibited low BMD (T-score < -2.5) at either the contralateral hip (16.7%), lumbar spine (15.8%), or both (23.2%). Half of the FHF patients had concurrent SKOA and low BMD, while approximately 20% presented with SKOA, low BMD, and high fall risk (self-rated questionnaire scores ≥ 4).



Conclusion: This study highlights a significant occurrence of both SKOA and low BMD among FHF patients. Given the manageability of both knee OA and osteoporosis, comprehensive evaluation and treatment are crucial. This includes considering surgical intervention for knee OA, particularly for those with osteoporosis at the spine or contralateral hip who are at the highest risk of subsequent fractures. Such a proactive approach could significantly mitigate the risk of further fragility fractures in this vulnerable population.

P708
GREATER VARIATION OF BONE TURNOVER MARKERS WITH DENOSUMAB THAN WITH ZOLEDRONATE IN OSTEOPOROTIC POSTMENOPAUSAL WOMEN WITH PRIMARY HYPERPARATHYROIDISM

K. Mlekus Kozamernik[1], L. Lezaić[2], M. Hočevar[3], T. Kocjan[1]

[1]UMC Ljubljana/Dept. of Endocrinology and Faculty of medicine, Univ. of Ljubljana, [2]UMC Ljubljana, Dept. of Nuclear Medicine and Faculty of Medicine, Univ. of Ljubljana, [3]Institute of Oncology, Dept. of Surgical Oncology and Faculty of Medicine, Univ. of Ljubljana, Ljubljana, Slovenia

Objective: Primary hyperparathyroidism (PHPT) is a state of increased bone turnover. We compared the antiresorptive effect of zoledronate and denosumab on bone-related biochemical parameters in PHPT.
Methods: We analyzed data from our ongoing trial comparing the effects of treatment with either annual zoledronate 5 mg iv or with biannual denosumab 60 mg sc in osteoporotic postmenopausal women with PHPT (ClinicalTrials.gov NCT04085419). Here, we compared the serum calcium levels (S-Ca), intact PTH (iPTH), and bone turnover markers (CTX, P1NP, bone-specific alkaline

phosphatase (BALP)) at baseline, 3 months (3 M), and 6 months (6 M) after the start of the treatment.

Results: We enrolled 40 osteoporotic females with PHPT (aged 73.0 (7.8 SD) y, 22.6 (10.0) years from menopause, BMI 27.77 (5.1) kg/m^2). After randomization, 20 women received zoledronate (ZOL group) and 20 denosumab (DMAB group). Within-group analysis showed a significant decrease in serum calcium (S-Ca) (DMAB Δ S-Ca 3 M -0.07 (0.15); p = 0.05, ZOL Δ S-Ca 3 M -0.09 (0.09); p < 0.001 mmol/L), an increase in iPTH level (DMAB Δ iPTH 3 M 61.91 (126.9); p = 0.042, ZOL Δ iPTH 3 M 30.24 (56.84); p = 0.002 ng/L) and a reduction in bone turnover markers from baseline to 3 months in each group. At 6 months, S-Ca remained low, and iPTH stayed high in both groups. The between-group comparison revealed a significantly greater decline of CTX and BALP in the DMAB group from baseline to (DMAB Δ CTX 3 M -0.952 (0.639) vs. ZOL Δ CTX 3 M -0.556 (0.439) μg/L; p = 0.03 and DMAB Δ BALP 3 M -19.92 (8.51) vs. ZOL Δ BALP 3 M -12.99 (9.3) μg/L; p = 0.03). The decline in P1NP was not statistically significant (DMAB Δ P1NP 3 M -75.45 (33.87) vs. ZOL Δ P1NP 3 M -55.12 (32.52) μg/L; p = 0.06). The increase in CTX from 3 to 6 M was significantly greater in the DMAB group (DMAB Δ CTX 6 M-3 M 0.223 (0.371) vs. ZOL Δ CTX 6 M-3 M 0.019 (0.085) μg/L; p = 0.03).

Conclusion: In postmenopausal women with PHPT, denosumab caused a greater decrease in CTX and BALP from baseline to 3 months and a greater increase in CTX from 3 to 6 months than zoledronate.

P709
PYCNODYSOSTOSIS

K. Nassar[1], S. Zaher[1], A. Ajerouassi[1], S. Janani[1]

[1]Dept. of Rheumatology, Ibn Rochd Univ. Hospital Center, Hassan II Univ., Faculty of Medicine and Pharmacy, Casablanca, Morocco

Pycnodysostosis, or Toulouse-Lautrec syndrome, is a rare autosomal recessive skeletal dysplasia, due to a defect in the gene encoding cathepsin K. Its prevalence is 1/100,000. It is characterized by short-limbed, short stature, typical facial appearance; convex nasal ridge and small jaw with obtuse mandibular angle, osteosclerosis with increased bone fragility, acro-osteolysis of the distal phalanges, delayed closure of the cranial sutures, and dysplasia of the clavicle. The diagnosis is usually based on the clinic and bone x-rays, or better by the study of the gene abnormally located on the cathepsin K gene (1q21). We present two isolated and separate cases, with typical clinical-radiological criteria, who were admitted for the assessment of bone status.

Case reports: We present two isolated and separate cases of pycnodysostosis with the context of consanguinity and past history of fractures. It is about 32-year-old women and 19-year-old man. The clinical examen found short stature, brachydactyly, dystrophic nails, facial dysmorphia with frontal bossing, bilateral ocular proptosis, micrognathia, open fontanels, prominent nose and abnormal teeth. Radiography showed acro-osteolysis of the distal phalanges, diffuse osteosclerosis, brachydactyly and wide cranial sutures. Both patients presented normal levels of vitamin D, phosphatase alkaline, TSH, free T4, blood and urinary calcium and phosphate levels. They are followed at bone disease unit in rheumatology department without any complications.

Conclusion: Pycnodysostosis is a rare inherited disorder of the bone, autosomal recessive. The diagnosis is essentially based on radio-clinical criteria. The bone pathological fractures occur due to sclerosis. skull bones appear thickened with generalized osteosclerosis. It can be revealed by fractures or exceptionally neurological complications that require specific treatment. The main differential diagnosis is osteopetrosis, of which there is a close and complex link. The treatment is based on that of complications. The prognosis is generally not involved.

P710
ASSESSMENT OF THE ASSOCIATION BETWEEN RHEUMATOID ARTHRITIS ACTIVITY AND BODY COMPOSITION

K. Nassar[1], A. Ajerouassi[1], S. Zaher[1], S. Janani[1]

[1]Dept. of Rheumatology, Ibn Rochd Univ. Hospital Center, Hassan II Univ., Faculty of Medicine and Pharmacy, Casablanca, Morocco

Objective: Rheumatoid arthritis (RA) is associated with altered body composition, which can result in rheumatoid cachexia caused by the inflammatory factors. RA patients often present with low muscle mass and decreased strength with high fat mass. The muscle changes may occur in the early stages of RA and persist throughout the disease duration like the excess of fat mass. The purpose of the study is to assess the link between the activity of the RA and the change of the fat and lean body mass.

Methods: Transversal and descriptive monocentric study conducted in 26 RA patients followed in the rheumatology department at the University Hospital Ibn Rochd. The study include 13 patients with active RA and 13 control group with remission disease. Demographic characteristics were noted in all patients as well as disease activity and treatment characteristics. All patients underwent a DXA with evaluation of the body mass precisely the lean and the fat mass. Finally the data of the 2 groups were compared to assess the relationship between disease activity and disturbances in body mass.

Results: 26 patients were included. The mean age was 52 ± 10.3, predominantly female (92.3%. The mean BMI was 26.2 ± 6.4. 7.6% are diabetic, 3.8% are smoking 53.8% are postmenopausal. Mean duration of RA 12 ± 7.4 y. Mean sedimentation rate was at 57.4 ± 31 mm/1e h and CRP at 26.6 ± 24.1 mg/l. The DAS 28 m crp was at 3.59 ± 1.35. The DXA found T-score m at the lumbar spine at (-2,1 ± 1,39), femoral neck at (-1,33 ± 1,32) and the total hip at (-1,13 ± 1,30). Concerning the evaluation of body mass, we found the following results: Total Leg average fat mass (g) at 3731 ± 2390, total leg mean lean mass (g) at 9267 ± 2619, total leg BMC (g) at 446 ± 159. The whole Body average Fat (g) at 17,715 ± 13,322, the

average lean whole body (g) at 46,883 ± 5802 and the BMC whole body (g) at 2201 ± 346 (table).

Table. Population characteristics and the assessment of the link between active RA and body mass

	Remission RA	Active RA PR	p-value
	Number=13	Number 13	
Demographic characteristics			
Mean age	58± 7,5	45,9±9,2	
Women	100%(13)	84,6%(11)	
Men	0	76,9%(2)	
Mean body index	24,1±6,1	28,3±6	
Menopause	77% (10)	15,3%(4)	
Treatments			
AINS	38,4%(5)	76,9%(2)	
Corticosteroids	42,3%(11)	77%(10)	
Mean dose	13,3	16,6	
Mean duration	9,5	4,7	
MTX	38,4%(5)	61,5%(8)	
SLZ	23%(3)	76,9%(2)	
Leflunomid	23%(3)	3,8%(1)	
Synthetic antimalarial	15,3%(4)	3,8%(1)	
Disease characteristics			
Mean duration	12,19± 8,2	11,9± 6,6	0,37
Mean age	45± 12	34,4±10,5	0,04
Mean sedimentation rate	59,4± 36,8	62,1±22,4	0,08
Mean C-reactive protein	21,4± 19,9	31,4±26,5	0,008
Mean DAS 28 CRP	2,48± 0,48	4,7±0,9	
Mean BMD (T-SCORE)			
Lumbar spine	0,887 ±0,174 (-2,1±1,27)	0,915 ±0,185 (-2,06±1,44)	0,08
Femoral neck	0,729 ±0,126 (-1,68±0,90)	0,835 ±0,185 (-1±1,55)	0,16
Total hip			0,04
Whole Body	0,753 ±0,133 (-1,65±1,03)	0,923 ±0,153 (-0,6±1,33)	
Mean total Leg fat mass (g)	3286± 2107	4177±2567	0,21
Mean total leg lean mass (g)	9074±3387	9461±1474	0,28
Total leg BMC (g)	410±195	482±100	0,11
Mean whole body fat (g)	15022±12819	20408±13271	0,2
Mean whole body lean mass (g)	43871±4700	49895±5205	0,001
Whole body BMC (g)	2059±333	2342±298	0,02

Conclusion: The assessment of fat and lean mass is important in patients followed for chronic inflammatory rheumatism such as RA. Inflammation induces an increase in fat mass and a decrease in lean mass with the risk of osteoporosis and fall, especially in patients with active rheumatism and obesity. Our study showed an increase in fat content in patients with active RA but without statistically significant difference with the control group. Regarding the lean mass, the expected results were not found in our study. This can be explained by the low number of patients and the few associated comorbidities. The changes in body composition during RA are linked to a cascade of metabolic abnormalities with inflammatory factors. There are multiple, complex interactions which remain largely unknown.

P711
SARCOPENIA IN POSTMENOPAUSAL WOMEN

K. Nassar[1], A. Ajerouassi[1], S. Zaher[1], S. Janani[1]

[1]Dept. of Rheumatology, Ibn Rochd Univ. Hospital Center, Hassan II Univ., Faculty of Medicine and Pharmacy, Casablanca, Morocco

Objective: From the age of 50 onwards a progressive loss of muscle mass may be observed, it often leads to real sarcopenia. Age, sedentary lifestyle, hormonal factors, unbalanced feeding habits represent major risk factors. The decrease in muscle tone leads to a loss of function, an altered quality of life, and the increase of fracture risk. Sarcopenia has a high prevalence in postmenopausal women. The purpose of the study is to evaluate the presence or absence of sarcopenia in menopausal women by calculating the skeletal muscle index.

Methods: Transversal and descriptive monocentric study conducted in 20 postmenopausal women homogeneous regarding demographic and risk factors. Demographic characteristics were noted. All women underwent a DXA, in rheumatology department at Ibn Rochd University Hospital, with evaluation of the body mass precisely the lean and the fat mass. We calculated the skeletal muscle index to assess the presence or absence of sarcopenia. The sarcopenia is retained when the skeletal muscle index is less than 5,45 kg/m^2 in woman.

Results: 20 postmenopausal women was including. The mean age was at 63,5 ± 7,2. The mean BMI was at 27,9 ± 4,7. There were no past medical history apart fracture in 30%. The mean age of menopause was at 48,2 ± 6. The mean T-score at the lumbar spine was at -2,82 ± 0,97 (BMD = 0,802 ± 0,138), femoral neck at -1,76 ± 0,6 (0,725 ± 0,08) and total hip at -1,5 ± 0,87 (0,792 ± 0,110. The evaluation of the whole body found: the mean total leg fat mass at 4337 ± 1460 g, the mean feat total leg mass at 8272 ± 1313 g, and the bone mineral content at 364 ± 60 g. The mean whole fat mass was at 20,013 ± 7705 g, the mean feat whole mass at 44,576 ± 6010 g, the whole bone mineral content at 2061 ± 219 g. The total feat mass (kg)/ taille^2 (m) was at 18,99 ± 2,66 kg/m^2. Finally, the skeletal muscle index was at 4,24 ± 0,76 kg/m^2, correlated with sarcopenia.

Conclusion: Sarcopenia has a high prevalence in postmenopausal women, what joins the results of our study. It affects at least 20% of the population from the age of 70 and also obese subjects, posing multiple diagnostic problems (obesity-sarcopenia syndrome). It is predominant in the lower limbs with a loss of muscle mass of around 15%, compared to 10% for the upper limbs. Sarcopenia is the consequence of multiple intertwined factors, which participate in its genesis, but also in its progression: neuronal, hormonal factors, lifestyle, vitamin D deficiency. The evaluation and prevention of sarcopenia are important in the management of postmenopausal women by acting on risk factors, muscle strengthening and prevention of falls and fractures.

P712
MANAGEMENT OF POSTMENOPAUSAL OSTEOPOROSIS ABOUT 113 CASES

K. Nassar[1], S. Zaher[1], A. Ajerouassi[1], S. Janani[1]

[1]Dept. of Rheumatology, Ibn Rochd Univ. Hospital Center, Hassan II Univ., Faculty of Medicine and Pharmacy, Casablanca, Morocco

Objective: Osteoporosis is the most common benign osteopathy. Reduced bone strength places patients at increased risk of fracture. The objective of this study is to describe the clinical, paraclinical and therapeutic profile of patients followed exclusively for postmenopausal osteoporosis at the consultation for osteopathies in the rheumatology department in a hospital structure, in order to evaluate and improve the management of patients.
Methods: This is a single-center descriptive study carried out in the rheumatology department of a university hospital center in the osteopathy center, over a period of nine years. The inclusion criteria were patients who had densitometric osteoporosis (according to the WHO classification), a severe fracture or a FRAX score above the threshold for therapeutic intervention. Those with osteopathy of malignant, metabolic or secondary origin were excluded.
Results: We identified 113 patients. The average age was 66.37 ± 9.29. The average BMI was 29.53 kg/m^2 ± 4.42 and BMI < 19 was found in 2.38%. Menopause before age 40 was found in 11% of cases. The history of peripheral fracture was noted in 33.63% of cases and axial fracture in 5.30% of cases. The average T-Score at the lumbar spine, femoral neck and total hip was -2.96 ± 1.02, -1.94 ± 0.94 and -1.7 ± 0.93 respectively. The vertebral fracture was found on standard radiography in 28.07% of cases. Hypo-vitamin D was noted in 75.22% of patients, 13.27% of patients had no indication for treatment and they were placed under surveillance, while the indication for treatment in the other cases was asked in case of severe fracture, T-Score < -3, FRAX score above the threshold for therapeutic intervention and on a case-by-case basis when the T-score was between -2.5 and -3.The most prescribed anti-osteoporotic treatment was oral bisphosphonates in 45.13%, followed by zoledronic acid in 8% of cases. The treatment was well tolerated. Digestive intolerance was noted in 5.31% of patients and the majority of cases had a densitometric gain during monitoring.
Conclusion: Postmenopausal osteoporosis is a common pathology that progresses silently. Its diagnosis is based on DXA and the search for clinical risk factors for fractures. Its treatment has benefited from the development of an effective and generally well-tolerated therapeutic arsenal. Our study is consistent with the results of the literature due to its frequency, diagnosis and therapeutic management as well as the association with clear vitamin D insufficiency.

P713
VITAMIN D STATUS IN 113 PATIENTS FOLLOWED FOR POSTMENOPAUSAL OSTEOPOROSIS

K. Nassar[1], A. Ajerouassi[1], S. Zaher[1], S. Janani[1]

[1]Dept. of Rheumatology, Ibn Rochd Univ. Hospital Center, Hassan II Univ., Faculty of Medicine and Pharmacy, Casablanca, Morocco

Objective: Osteoporosis is the most common benign osteopathy. Reduced bone strength places patients at increased risk of fracture. Menopause represents a period at risk of osteoporosis and a drop in vitamin D, given the hormonal upheaval caused. Knowing the protective role of vitamin D on bone tissue, its supplementation should systematically be evaluated. The objective of this study is to evaluate the vitamin D status in patients followed for postmenopausal osteoporosis, through 113 cases.
Methods: This is a single-center descriptive study carried out in the rheumatology department of a university hospital center, over a period of 9 y. The inclusion criteria were patients who had densitometric osteoporosis (according to the WHO classification), and who had received vitamin D testing. Those with osteopathy of malignant, metabolic or secondary origin were excluded. and patients who do not have a vitamin D dosage.
Results: We identified 113 patients. The average age was 66.37 ± 9.29. The average BMI was 29.53 kg/m^2 ± 4.42 and BMI < 19 was found in 2.38%. Menopause before age 40 was found in 11% of cases. The history of peripheral fracture was noted in 33.63% of cases and axial fracture in 5.30% of cases. The average T-Score at the lumbar spine, femoral neck and total hip was -2.96 ± 1.02, -1.94 ± 0.94 and -1.7 ± 0.93 respectively. On a biological level, the drop in vitamin D was found in 75.22% of patients, 64.60% of whom were insufficient and 10.62% deficient. While knowing that 35% of patients have already received or were on vitamin D supplementation at inclusion. They received correction protocols according to the schemes proposed by the recommendations of learned societies in addition to bone-targeted treatment for those who were eligible for anti-osteoporotic treatment.
Conclusion: Postmenopausal osteoporosis is a common pathology that progresses silently. Vitamin D reduction is often associated with it. Our study is consistent with the results of the literature regarding the clear association of vitamin D insufficiency and postmenopausal osteoporosis. Assessment of vitamin D status before and during patient follow-up is essential for better therapeutic care.

P714
ULTRASOUND-BASED FRACTURE RISK DISCRIMINATION IN PATIENTS WITH DIABETES MELLITUS

E. Wiebe[1], C. Dehnen[1], A. Galindo[2], M. Lukas[3], H. Paula[1], H. Aghamiry[2], Z. Liu[2], N. Lepetre[1], O. Palmer[4], K. Raum[2]

[1]Charité – Universitätsmedizin Berlin, Medizinische Klinik m.S. Rheumatologie und Klinische Immunologie, [2]Charité – Universitätsmedizin Berlin, Center for Biomedicine—Imaging-Simulation & Stimulation, [3]Charité – Universitätsmedizin Berlin, Medizinische Klinik für Endokrinologie, [4]Aemedes Gruppe, Endokrinologikum Berlin, Berlin, Germany

Objective: Diabetes mellitus (DM) is a common chronic metabolic disease that increases the risk of fragility fractures, with DXA-based BMD often underestimating fracture risk in these patients. Cortical backscatter (CortBS) ultrasound, a radiation-free technique, examines cortical viscoelastic material and microstructural properties. This study aims to assess CortBS's discrimination performance in DM patients compared to the gold standard (DXA).
Methods: The study (DRKS00029331, EA4/140/22) included 48 women and 38 men with DM (Type I = 38, Type II = 46, Type other = 2), aged > 49 y, along with 77 matched individuals without DM. DXA measured bone density in the lumbar spine and both femoral sites. CortBS measurements were taken in the anteromedial tibia using a SonixTOUCH with custom software. Multivariate analysis of variance assessed the impact of DM type on CortBS and DXA. Partial least squares discriminant analyses with cross-validation were used to compare the discrimination performance for vertebral, non-vertebral, and any fragility fractures, considering gender, age, and anthropometric information (AP: weight, height, BMI).
Results: The DXA T-score was influenced by AP factors and age and was significantly higher in DM patients than in those without DM (Type I: + 0.73 SD, Type II: + 1.36 SD), but not significantly different between patients with and without fractures. The CortBS risk score was independent of AP factors, gender, and DM, and was

significantly larger in patients with non-vertebral fractures. CortBS outperformed DXA for all fracture types, the difference was significant for vertebral and non-vertebral fractures (AUCDXA $\leq$ 0.58, AUCCortBS $\leq$ 0.64, Fig. 1).

Conclusion: Irrespective of DM status, patients with fractures exhibited an elevated fracture risk in the ultrasound score, but not a decreased DXA T-score (Fig. 1).

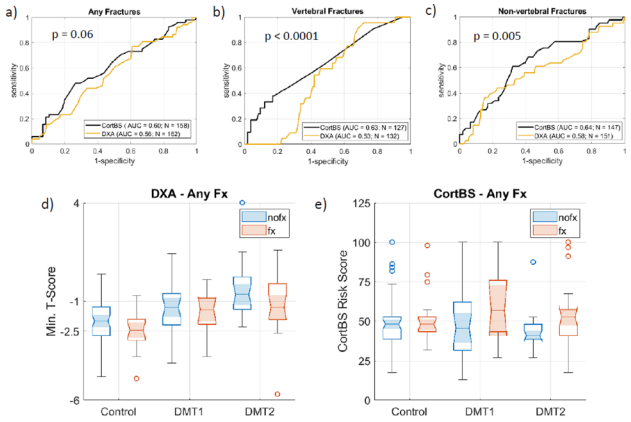


Fig. 1 ROC-AUC with 5-fold cross-validation for a) any, b) vertebral and c) non-vertebral fragility fractures for all study participants (independent of DM disease). DXA T-scores (d) show the well-known "overestimation" in patients with DM. The CortBS risk score (e) is particularly elevated in patients with DM type I and fractures.

P715
CORTICAL ULTRASOUND SPECTROSCOPY DISCRIMINATES FRAGILITY FRACTURES IN WOMEN AND MEN BETTER THAN BONE MINERAL DENSITY

G. Armbrecht[1], A. Galindo[2], H. Aghamiry[2], Z. Liu[2], N. Lepetre[3], K. Raum[2], E. Wiebe[3]

[1]Charité—Universitätemedizin Berlin, Klinik für Radiologie, [2]Charité – Universitätsmedizin Berlin, Center for Biomedicine—Imaging- Simulation & Stimulation, [3]Charité – Universitätsmedizin Berlin, Medizinische Klinik m.S. Rheumatologie und Klinische Immunologie, Berlin, Germany

Objective: Cortical ultrasound spectroscopy (CortBS) is a novel non-ionizing imaging technique that measures viscoelastic material properties and intracortical pore size distribution in the tibia. A preliminary study in postmenopausal women with low BMD confirmed better fracture discrimination of CortBS over the gold standard (DXA). This research aims to evaluate the discrimination performance of CortBS in male and female patients and young healthy volunteers and compare it with DXA.

Methods: The study (DRKS00025849, EA4/068/19) contained 144 women (including 55 postmenopausal women from a previous study [1]) and 33 men (age: 30–86 y, DXA: > 56 y). DXA bone density was taken at the lumbar spine and both femoral sites. CortBS measurements were performed in the anteromedial region of the tibia using a SonixTOUCH with custom software. Multivariate analysis of variance investigated the influence of gender, age and anthropometric (AP) information (height, weight, BMI) on CortBS and DXA. Partial least squares (PLS) discriminant analyses with cross-validation were used to compare the discrimination performance for vertebral, non-vertebral and any fragility fractures with and without gender, age and AP information.

Results: The DXA T-score was affected by weight and BMI and was significantly lower in patients with non-vertebral fractures ($p < 0.05$). CortBS fracture risk score was significantly increasing with age ($p < 0.01$) and significantly higher in patients with fractures ($p < 0.005$). CortBS outperformed DXA's discrimination ability for all fracture types ($AUC_{DXA} \leq 0.60$, $AUC_{CortBS} \leq 0.72$, Fig. 1). Regardless of gender, patients with fractures showed an increased fracture risk in the ultrasound score, but not in the DXA T-score (Fig. 1).

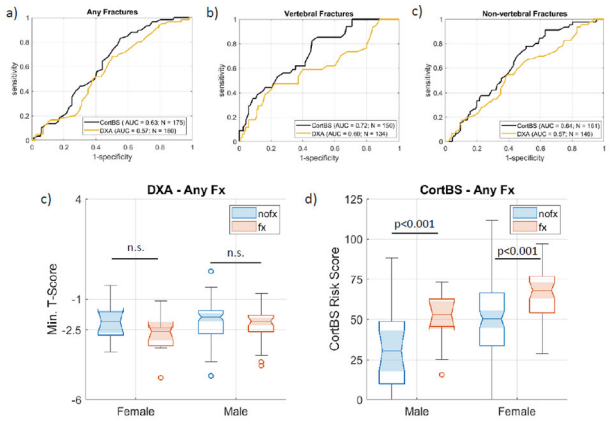


Fig. 1 ROC-AUC with 5-fold cross-validation for (a) any, (b) vertebral and (c) non-vertebral fragility fractures. DXA T-scores (c) and CortBS-risk scores (d) for any fractures. For patients with fractures the CortBS score is significantly higher, which is independent of the gender.

Conclusion: CortBS exhibits the general age- and gender-associated fracture risk and has a significantly better discrimination performance than DXA.

Reference: (1) Armbrecht G, et al. JBMR Plus, 2021, e10536.

P716
USE OF INTRAVENOUS IRON FOR ANAEMIA IN ELDERLY HIP FRACTURE PATIENTS DURING PERI-OPERATIVE PERIOD: A SYSTEMATIC REVIEW AND META-ANALYSIS

K. S. Lai[1]

[1]Dept. of Medicine and Geriatrics / Tai Po Hospital / Hospital Authority / HKSAR, Tai Po, Hong Kong SAR China

Objective: Newer generations of intravenous iron preparations have been developed in recent decades and their use have been increasing since then as alternatives or adjuvants to conventional blood transfusion in anaemia management among elderly patients during their peri-operative periods, for example, hip fracture repair surgeries. The aim of this study is to review whether the use of intravenous iron would give comparable or even more favourable clinical and administrative outcomes, when compared with conventional treatment group, among elderly hip fracture patients.

Methods: A systematic review of randomized controlled trials on the topic done between 2000–2022 is conducted. A meta-analysis on the data extracted is performed to compare various clinical (occurrence and amount of blood transfusion, side effects, mortality and morbidities) and administrative (hospitalization length of stay (LOS)) outcomes.

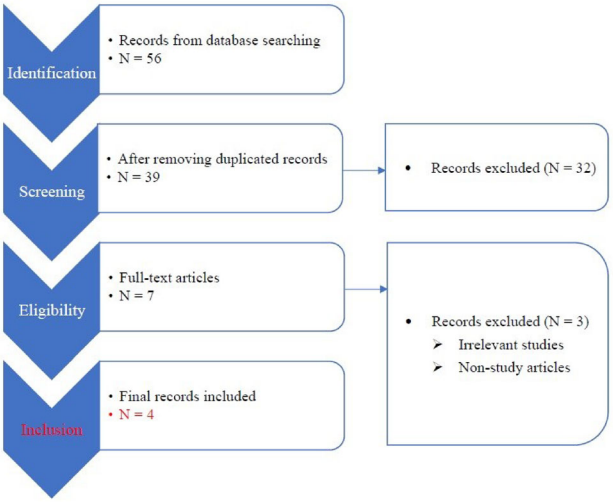


Figure 1 – Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA)

Results: Four trials conformed to inclusion criteria. The pooled data consisted of 732 subjects (intervention group: 367, control group: 365) with average age 84.6 years old. Meta-analysis showed that intravenous iron reduced hospitalization LOS which was not statistically significant. Furthermore, there were no significant differences between the two groups in terms of blood transfusion rate and 30-d mortality.

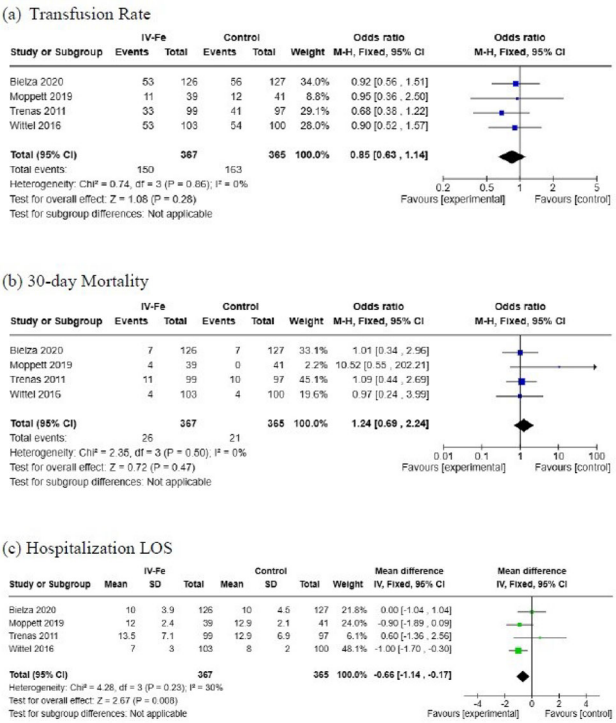


Figure 2 – Forest plots for outcomes

Conclusion: This review shows comparable clinical and administrative outcomes in terms of blood transfusion requirement, 30-d mortality and hospitalization LOS between intravenous iron and conventional treatment groups of elderly hip fracture patients during their peri-operative periods. Further studies are warranted in assessing the long-term effects of intravenous iron, as well as the use of the newest fourth-generation intravenous iron preparation.

P717
ACUTE DROP IN HAEMOGLOBIN LEVEL AFTER HIP FRACTURE SURGERY

K. S. Lai[1]

[1]Dept. of Medicine and Geriatrics / Tai Po Hospital / Hospital Authority / HKSAR, Tai Po, Hong Kong SAR China

Objective: Haemoglobin drop after hip fracture surgery in elderly patients is common. While this is usually a result of the fracture itself or as a consequence after surgery-related blood loss, other causes of major active bleeding should also be considered. To date, data for the exact extent of such haemoglobin drop is lacking. This study is to review the incidence and extent of acute haemoglobin drop after hip surgery in elderly patients suffering from a hip fracture, and the possible contributing factors or correlation.
Methods: Patients $\geq$ 60 years old admitted due to hip fracture with surgery were reviewed for basic demographics, hip fracture types and surgery types, and serum haemoglobin levels before and after surgery. Those with blood transfusion before and during operation were excluded. The post-operative haemoglobin drop was compared among different subgroups (fracture types, surgery types, use of anti-platelets or anti-coagulants).
Results: 333 patients were eligible for this study. Their overall mean post-operative haemoglobin drop was 2.73 g/dl. Patients with extra-capsular fractures and patients receiving arthroplasty surgery had greater post-operative haemoglobin drop than those with intracapsular fractures and receiving internal fixation surgery, respectively, though the differences were not statistically significant. Only 14 patients had documented major active bleeding or a subsequent gastro-intestinal endoscopy performed.

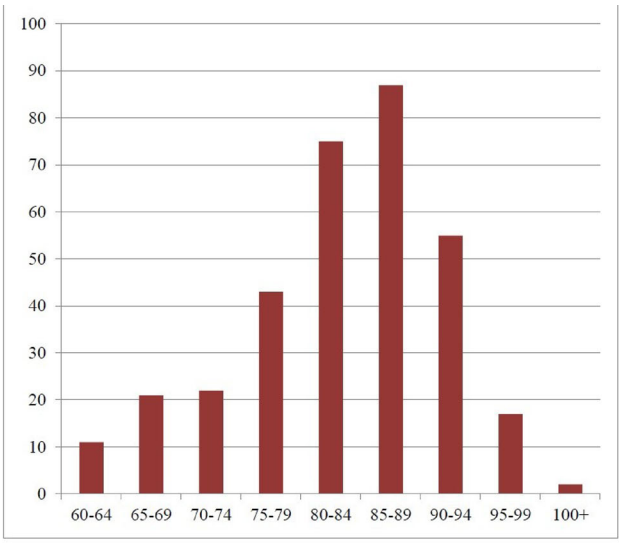


Figure 1: Age Distribution of All Hip Fracture Patients with Surgery

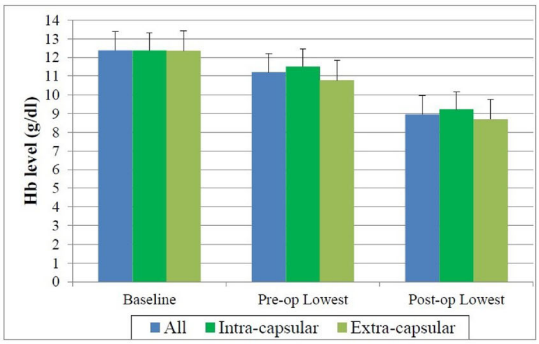


Figure 2: Haemoglobin Level Trends among Different Fracture Types

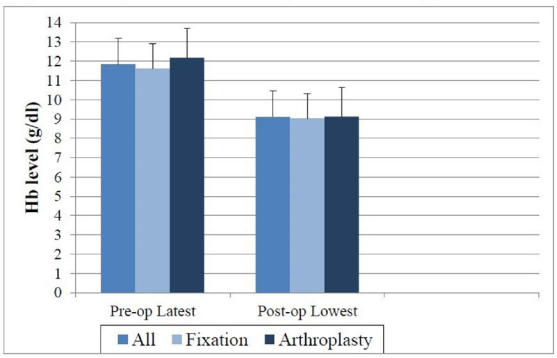


Figure 3: Haemoglobin Level Trends among Different Surgery Types

Conclusion: The type of fracture and the type of surgery were possible associated factors for acute haemoglobin drop in elderly patients after hip fracture surgery.

P718
RISK FACTORS AND FREQUENCY OF VERTEBRAL FRACTURES IN PATIENTS WITH REDUCED BONE DENSITY

K. S. Marković[1], R. Filipov[1], M. Bačević[2], M. M. Bačević[2]

[1]Institution of Rheumatology "Niška Banja", [2]Faculty of Medicine, Niš, Serbia

Objective: Osteoporosis is a generalized metabolic process that reduces bone density and increases susceptibility to fractures. Osteoporotic vertebral fractures are a leading cause of disability and morbidity, particularly in the elderly and are usually unrecognized. We aimed to study frequency of osteoporotic vertebral fractures and their association with the most common risk factors.
Methods: The retrospective analysis included 11,836 patients. BMD was measured at: lumbar spine and hip by DXA apparatus Hologic Discovery. Patients whose hip or lumbar spine T-score was greater than -1 SD were excluded from the analyses, so 4971 patients were analyzed. The fracture was diagnosed radiologically.
Results: Of the 4971 patients, 93.31% (4638) were women and 6.69% (333) were men. The age of the respondents was 60–80 y (average 68.55 y). Of the 4971 subjects, 140 (2.82%) had a vertebral fracture, 101 women (72.15%) and 39 men (27.85%) and 96 (68.56%) had osteoporosis. 54 (1.09%) had one vertebral fracture, 21 (0.42%) had 2 vertebral fractures, 12 (0.24%) had 3 vertebral fractures and 9 (0.18%) had 4 fractures. In the zone of osteopenia, the percentage of vertebral fractures was: 89 (1.81%) subjects had one vertebral fracture, 37 (0.75%) had 2 vertebral fractures, 17 (0.35%) had 3 vertebral fractures and 13 (0.27%) had 4 fractures. The most common risk factor in patients with vertebral fractures was low BMI (< 18.5 g/cm^2), 122 patients (87.78%), followed by previous fractures 87 (62.44%), smoking in 42 patients (29.82%), early menopause 38 (27.16%) subjects, glucocorticoid intake 30 (21.84%), autoimmune diseases 25 (17.92%), fractures in the family 13 (9.52%) and alcohol consumption 4 patients (2.94%).
Conclusion: Osteoporosis complicated by vertebral fractures is more common in women, with reduced bone density (on the level of osteopenia) and low BMI. Based on this retrospective study, we believe that it is necessary to pay more attention to the early recognition of predisposing risk factors for vertebral fractures.

P719
ACUPUNCTURE FOR TREATING TEMPOROMANDIBULAR JOINT DISORDERS: A SYSTEMATIC REVIEW

C. Jae-Heung[1], K. Se-Yun[1], Y. You-Suk[2]

[1]Kyung-Hee Univ. Medical Center, Seoul, [2]Chamjalham Hospital of Korean Medicine, Gyeonggi-do, South Korea

Objective: To assess the clinical evidence for or against acupuncture and acupuncture-like therapies as treatments for temporomandibular joint disorder (TMD).
Methods: Nine electronic databases were searched from their inception to September 2023; PubMed, Cochrane Library, Embase, CNKI, KISS, ScienceOn, RISS, OASIS, KMBASE. Only randomized controlled trials were included in this review. All RCTs of

acupuncture for TMD were searched without language restrictions. The primary outcome was visual analogue scale (VAS) for pain. The secondary outcomes included mouth opening, muscle tenderness and adverse events. Continuous outcome data were presented as mean differences with 95%CIs.

Results: Nine RCTs involving 423 participants were included in this systematic review and meta-analysis. Results revealed that acupuncture improved VAS for pain vs. all controls (MD = -1.04, 95%CI:-2.00 $\sim$ -0.09, Z = 2.14, p = 0.03, I^2 = 94%), vs. sham laser (MD = -0.62, 95%CI:-1.22 $\sim$ -0.02, Z = 2.04, p = 0.04, I^2 = 0%). Muscle tenderness were significantly improved in the acupuncture compared to controls (MD = -1.17, 95%CI:-2.15 $\sim$ -0.19, Z = 2.35, p = 0.02, I^2 = 56%). No significant difference was observed in mouth opening between acupuncture and controls (MD = 0.15, 95%CI:-0.27 $\sim$ 0.57, Z = 0.68, p = 0.49, I^2 = 41%). Adverse events were reported in only one study.

Conclusion: Our systematic review and meta-analysis demonstrate that the evidence for acupuncture as a symptomatic treatment of TMD is limited. Further rigorous and large randomized controlled trials are required to confirm and clarify our result, and to establish beyond doubt whether acupuncture has therapeutic value for this indication.

P720
EFFECTS OF VITAMIN K2 AND D3 ON MINERALIZTION BEHAVIOUR OF HUMAN OSTEOPOROTIC OSTEOBLASTS ON A ROUGHENED TITANIUM SURFACE IN VITRO

K. Tscheu[1], K. Schultz[1], C. Suschek[1], J. Windolf[1], U. Maus[1]

[1]Dept. of Orthopaedics and Trauma Surgery at Düsseldorf Univ. Hospital, Düsseldorf, Germany

Objective: This project investigates the effects of a roughened surface structure of titanium preparations on the osteogenic behavior of human healthy osteoporotic osteoblasts (hopOB) under the application of vitamin K2 (VK2) and D3 (VD3).

Methods: Cell cultures hopOB were isolated from femoral head specimens (hopOB with T < -2.5 in DXA measurement). The titanium plates (Peter Brehm GmbH; diameter 11.7 mm; thickness: 2.0 mm) have a conventional roughened surface structure. Cells in plastic wells were used as control. Calcein and fluorescein diacetate visualized the extracellular matrix (ECM). Alizarin Red S staining quantified the degree of calcification and alkaline phosphatase (ALP) enzyme activity indicated the differentiation.

Results: The ECM could be visualized clearly on both surfaces. A crosslinking was particularly evident on the titanium surface. After 24 h of mineralization, this was also more pronounced on the rough titanium surface than in the respective control cells. After 7 and 14 days, the degree of mineralization of the hopOBs on the rough titanium surface under the influence of VK2 was significantly ($p < 0.05$) higher than the degree of mineralization without the vitamin (on average lower by a factor of 1.6). The degree of differentiation of the hopOBs was initially more pronounced on the titanium preparations than on the plastic surface. After 21 d, there was a significantly higher ALP activity of the hopOBs under VD3 on the rough titanium surface compared to the ALP activity with VK2 and without vitamins.

Conclusion: Under the influence of the vitamins, mineralization and differentiation in interaction with the titanium surface proceeds better than without the addition of vitamins. In principle, the rough titanium surface promotes the formation of the ECM and differentiation. Initially, VK2 has a positive effect, especially on mineralization. In the long term, VD3 positively supports the process of differentiation.

P721
IMPACT OF VITAMIN K2 ON MINERALISATION BEHAVIOUR OF HUMAN ADIPOSE STEM CELLS ON A MODIFIED TITANIUM SURFACE IN VITRO

K. Tscheu[1], K. Schultz[1], C. Suschek[1], J. Windolf[1], U. Maus[1]

[1]Dept. of Orthopaedics and Trauma Surgery at Düsseldorf Univ. Hospital, Düsseldorf, Germany

Objective: This work investigates the behaviour of human adipose stem cells (ASCs) on a roughened titanium surface under the influence and absence of vitamin K2 (VK2) to implement an in vitro model.

Methods: Cell cultures ASCs were isolated from subcutaneous adipose tissue. The titanium plates (Peter Brehm GmbH; diameter 14.7 mm; thickness: 2.0 mm) show a conventional roughened and a smooth surface structure. Cells in plastic wells were used as control. Calcein visualized the extracellular matrix (ECM) and Bisbenzimide showed the cell nucleus. The degree of calcification of the ECM is measured by using Alizarin Red S staining and the activity of alkaline phosphatase (ALP) indicated the degree of differentiation.

Results: The ECM was clearly visible on both sides of the plates. Under VK2, a qualitatively higher cross-linking between the cells was observed after 7 d. After 7 d, the mineralisation of the ECM on the rough surface structure was significantly ($p < 0.05$) more extensive than that of the respective control cells, both with and without VK2. With VK2 treatment, the ECM was significantly more developed on the rough titanium surface structure after 14 d than on the rough surface without VK2 treatment. ALP activity was significantly higher after 21 d on the rough side with and without VK2 than on the respective control cells. Furthermore, the degree of differentiation on the rough surface of the plates with VK2 was significantly higher after 21 d than without VK2 on the rough surface structure.

Conclusion: Basically, the rough surface structure ensures faster and more extensive mineralisation and differentiation. This effect is supported by VK2, whereby the mineralisation is initially positively reinforced by VK2 and the degree of differentiation increases in the long term.

P722
OSTEOPOROSIS SCREENING USING X-RAY ASSESSMENT AND OSTEOPOROSIS SELF-ASSESSMENT TOOL FOR ASIANS IN PATIENTS UNDERGOING HIP SURGERY

K. Uemura[1], R. Higuchi[1], K. Takashima[1], H. Mae[1], H. Abe[2], T. Imagama[3], T. Sakai[3], S. Okada[1], H. Hamada[1]

[1]Osaka Univ., Suita, [2]Hoshigaoka Medical Center, Hirakata, [3]Yamaguchi Univ., Ube, Japan

Objective: Osteoporosis plays an important role in the initial fixation and postoperative period after hip surgery. However, it is difficult to screen using DXA. Therefore, the present study aimed to develop a simple method to efficiently screen for osteoporosis using a combination of anteroposterior hip X-ray assessment and the Osteoporosis

Self-Assessment Tool for Asians (OSTA), which is calculated as (body weight—age) × 0.2.
Methods: One hundred Japanese women (age: 73 ± 11 y, body weight: 54.4 ± 11.1 kg) who underwent hip surgery, anteroposterior hip X-ray, and DXA at two institutions were included. Based on the DXA results of the total proximal femur, 35 cases were diagnosed with osteoporosis. 15 orthopaedic surgeons visually inspected the hip X-ray images and scored the suspicion of osteoporosis on a scale of 1–4 (1: very unlikely, 4: very suspicious), which is referred to as "pred-score." In addition, OSTA was calculated as a continuous variable (OSTA score). Osteoporosis was screened using the pred-score and OSTA score, and both scores were analyzed using the receiver operating characteristic curves.
Results: The area under the curves (AUCs) of the pred-score and OSTA score were 0.626–0.875 and 0.817 across surgeons, respectively. When both scores were used, the AUC for screening osteoporosis ranged from 0.821–0.915 across surgeons. Significant improvement from AUCs calculated with the pred-score or OSTA score was found in 11 surgeons (73.3%).
Conclusion: The combination of X-ray assessment and OSTA can be used to screen for osteoporosis. By combining the pred-score and OSTA score, an AUC > 0.82 was maintained across surgeons for predicting osteoporosis. The results demonstrate the potential of combining visual assessment with OSTA, which may be used as a new simple screening tool for osteoporosis in daily clinical practice.
Acknowledgments: This study was supported by the Japanese Orthopaedic Association (JOA-Subsidized Science Project Research: 2023–2), Grant-in-Aid for Science Research from the Japanese Society for Replacement Arthroplasty Foundation (2023-RP05), and the Japan Society for the Promotion of Science Grants-in-Aid for Scientific Research (KAKENHI) Number 21K16655.

P723
ASSOCIATION BETWEEN SARCOPENIA AND OBESITY IN WOMEN WITH RHEUMATOID ARTHRITIS

K. Zouaoui[1], S. Mhamdi[1], R. Ben Othmane[2], M. Abbes[1], S. Rahmouni[1], S. Boussaid[1], S. Rekik[1], H. Sahli[1], M. Elleuch[1]

[1]Rheumatology Dept., La Rabta Hospital, [2]National Institute of Nutrition, Tunis, Tunisia

Objective: To determine whether there is an association between obesity and sarcopenia in women with rheumatoid arthritis (RA).
Methods: A single-center cross-sectional study including female patients with RA meeting the ACR/EULAR 2010 criteria was conducted. Demographic, clinical and paraclinical data were collected. The participants underwent a hand grip test using a dynamometer to evaluate muscle strength. The assessment of muscle mass was conducted using a bioelectrical impedance analysis (BIA) and DXA. The appendicular skeletal muscle mass index (ASMI) was calculated by dividing appendicular lean mass by squared height. Sarcopenia was defined by a hand grip test < 16 kg and an ASMI ≤ 5.5 kg/m^2. Obesity was defined by a BMI ≥ 30 kg/m^2.
Results: 55 female patients were included with an average age of 58 ± 8 y [40–76]. Among our participants, 34.5% (n = 19) had diabetes, 23.6% (n = 13) had dyslipidemia, and 5.5% (n = 3) had hypothyroidism. The average weight and height were 71 ± 15 [42–103] kg and 156 ± 7 [143–170] cm, respectively. The mean BMI was 29 ± 6 [17–44] kg/m^2. The mean duration of RA was 9 ± 6 y [1–30]. RA was immunopositive in 90.9% of the cases and erosive in 90.9% of the cases. The mean (DAS28-CRP) was 4 ± 1.8 [1.2–6.5]. The average hand grip test result was 9.5 ± 6 kg [1.8–25.6]. The mean ASMI was 7.4 ± 1.2 kg/m^2 [5.4–11] using BIA and 6.47 ± 1.1 kg/m^2 [4.19–8.84] using DXA. Sarcopenia was present in 85.5% of the patients (n = 47), while obesity was noted in 43.6% of the patients (n = 24). There was no observed significant correlation between these two parameters (p = 0.508).
Conclusion: Sarcopenia and obesity were common in our female RA patients. However, no association has been found between these two parameters.

P724
IS SARCOPENIA ASSOCIATED WITH OSTEOPOROSIS IN FEMALE PATIENTS WITH RHEUMATOID ARTHRITIS?

K. Zouaoui[1], S. Mhamdi[1], R. Ben Othmane[2], S. Rahmouni[1], M. Abbes[1], S. Boussaid[1], S. Rekik[1], H. Sahli[1], M. Elleuch[1]

[1]Rheumatology Dept., La Rabta Hospital, [2]National Institute of Nutrition, Tunis, Tunisia

Objective: To determine if there is an association between sarcopenia and osteoporosis in female patients with rheumatoid arthritis (RA).
Methods: A single-center cross-sectional study was conducted on female patients with RA meeting the ACR/EULAR 2010 criteria. Demographic, clinical, paraclinical and therapeutic data of participants were collected. Muscle mass was assessed using bioelectrical impedance analysis (BIA) and DXA. The appendicular skeletal muscle index (ASMI) was calculated as the appendicular muscle mass divided by squared height. Muscle strength was evaluated by the hand grip test using a dynamometer. A patient was considered sarcopenic if her ASMI was ≤ 5.5 kg/m^2 AND her hand grip test was < 16 kg. Bone densitometry was performed to identify osteoporosis, defined by a T-score ≤ -2.5 standard deviations at the lumbar spine and/or femoral neck.
Results: Our study englobed 55 female patients with an average age of 58.22 ± 7.9 y [40–76]. 65.5% lived in urban areas and 81.8% were unemployed. The mean duration of RA was 9.2 ± 6.4 y [1–30]. RA was immunopositive in 90.9% of the cases and erosive in 90.9% of the cases. The mean DAS28-CRP was 4 ± 1.8 [1.2–6.5]. Active disease with a DAS28-CRP ≥ 5.1 was noted in 89.1% of the patients (n = 49). The average Health Assessment Questionnaire (HAQ) was 1.08 ± 0.6 [0.1–2.5]. Corticosteroids were used in 98.2% patients (n = 54), with an average dose of 6 ± 1.9 mg of prednisone. At least one conventional synthetic disease-modifying antirheumatic drug (cs-DMARD) was prescribed. 41.8% patients (n = 23) were treated with a biologic. The mean hand grip test was 9.5 ± 5.7 kg [1.8–25.6]. The mean ASMI was 7.4 ± 1.2 [5.4–11] kg/m^2 by BIA and 6.5 ± 1.1 [4.2–8.8] kg/m^2 by DXA. Sarcopenia was present in 85.5% (n = 49) of patients and osteoporosis was present in 37.3% of the patients (n = 19). There was a significant association between sarcopenia and osteoporosis (p = 0.021).
Conclusion: According to our study, sarcopenia seems to be associated with osteoporosis in female RA patients.

P725
IMPACT OF DIABETES ON OSTEOPOROSIS IN PATIENTS WITH RHEUMATOID ARTHRITIS

K. Zouaoui[1], R. Ben Othmane[2], S. Rahmouni[1], I. Trabelsi[2], M. Abbes[1], S. Boussaid[1], S. Rekik[1], H. Sahli[1], M. Elleuch[1]

[1]Rheumatology Dept., La Rabta Hospital, [2]Dept. of Nutrition, National Institute of Nutrition, Tunis, Tunisia

Objective: Rheumatoid arthritis (RA) is a common chronic inflammatory disease often associated with osteoporosis. Diabetes represents a frequently encountered comorbidity in RA. Through this work, we studied the effect of diabetes on osteoporosis in RA patients.

Methods: A 3-month cross-sectional study was carried out in a rheumatology department. Patients followed for RA according to the ACR/EULAR 2010 criteria were included in the work. Demographic, clinical and biological data were collected. We retained the significance threshold of 0.05 to study the correlation between diabetes and osteoporosis.
Results: We recruited 52 RA patients. The average age was 56.1 ± 12.1 y [22–85] with a clear female predominance (84.6%). RA evolved on average for 13 ± 8.32 y [2–30]. It was immunopositive in 88.5% of cases and erosive in 94.2% of cases. The mean number of painful joints was 9.1 ± 7.7 [0–28] and the mean number of swollen joints was 4.8 ± 4.7 [0–20]. The mean DAS28 was 4.47 ± 1.48 [1.28–8.19] and 32.7% of the population had highly active disease. Among the patients, 19.2% had diabetes and 32.7% had osteoporosis. We did not note a significant correlation between diabetes and osteoporosis in our patients (p = 0.264).
Conclusion: Diabetes is not associated with osteoporosis risk in RA patients.

P726
IS C-REACTIVE PROTEIN CORRELATED WITH SARCOPENIA IN RHEUMATOID ARTHRITIS?

K. Zouaoui[1], R. Ben Othmane[2], M. Abbes[1], S. Rahmouni[1], I. Trabelsi[2], S. Boussaid[1], S. Rekik[1], H. Sahli[1], M. Elleuch[1]

[1]Rheumatology Dept., La Rabta Hospital, [2]Dept. of Nutrition, National Institute of Nutrition, Tunis, Tunisia

Objective: It is currently admitted that sarcopenia is common in rheumatoid arthritis (RA). Actually, there is no biological marker for sarcopenia. The objective of our study was to investigate the link between C-reactive protein (CRP) and sarcopenia during RA.
Methods: It was a 3-month cross-sectional study including patients followed for RA meeting the ACR/EULAR 2010 criteria. Demographic and clinical data of our patients were collected. The CRP level was noted. We used the hand grip test to assess the muscular strength of our patients. Sarcopenia was defined by muscle strength < 27 kg in men and 16 kg in women. The significance threshold p was set at 0.05.
Results: In total, 52 patients were included with a sex ratio M/F = 0.18. The mean age was 56.1 ± 12.1 y [22–85]. The average duration of disease was 13 ± 8.32 y [2–30]. RA was immunopositive in 88.5% of cases and erosive in 94.2% of cases. Half of the patients were obese with a mean BMI of 28 ± 3.46 kg/m^2 [24–30]. The DAS28 averaged 4.47 ± 1.48 [1.28–8.19] and 32.7% of the population had highly active disease. CRP level averaged 14.04 ± 9.35 mg/l [0–68.2]. Muscle strength was 13.1 ± 11.05 kg [3–40.6]. Sarcopenia was noted in 22.4% of participants. There was no significant association between the CRP level and the existence of sarcopenia (p = 0.93).
Conclusion: The CRP level has no impact on sarcopenia during RA.

P727
EVALUATION OF ADHERENCE TO THE MEDITERRANEAN DIET IN PATIENTS WITH RHEUMATOID ARTHRITIS

K. Zouaoui[1], R. Ben Othmane[2], S. Rahmouni[1], M. Abbes[1], I. Trabelsi[2], S. Boussaid[1], S. Rekik[1], H. Sahli[1], M. Elleuch[1]

[1]Rheumatology Dept., La Rabta Hospital, [2]Dept. of Nutrition, National Institute of Nutrition, Tunis, Tunisia

Objective: Dietary measures are currently integrated into the non-pharmacological management of chronic inflammatory joint diseases particularly rheumatoid arthritis (RA). The objective of our study was to evaluate the adherence of RA patients to the Mediterranean diet and to assess its impact on disease activity.
Methods: A cross-sectional study was carried out over 3 months including patients followed for RA according to the ACR/EULAR 2010 criteria. The socio-demographic, clinical and biological data of these participants were collected. RA activity was judged by the DAS28 score. We used a questionnaire from the PREDIMED study, composed of 14 items, to study our population's adherence to the Mediterranean diet [1].
Results: The study included 52 patients followed for RA with a sex ratio M/F = 0.18 and a mean age of 56.1 ± 12.1 y [22–85]. The mean disease duration was 13 ± 8.32 y [2–30]. RA was immunopositive in 88.5% of cases and erosive in 94.2% of cases. 50% of patients were obese with a mean BMI of 28 ± 3.46 kg/m^2 [24–30]. The number of painful joints averaged 9.1 ± 7.7 [0–28] and the number of swollen joints averaged 4.8 ± 4.7 [0–20]. The DAS28 averaged 4.47 ± 1.48 [1.28–8.19]. The average score for adherence to the Mediterranean diet was 7.23 ± 1.85 [3–11]. This diet had no significant impact on the DAS28 score (p = 0.88). It also had no impact on the number of painful joints (p = 0.231) nor on the number of swollen joints (p = 0.409).
Conclusion: The Mediterranean diet does not seem to have any influence on RA activity.
Reference: (1) Martínez-González MA, et al. PloS One 2012;7:e43134.

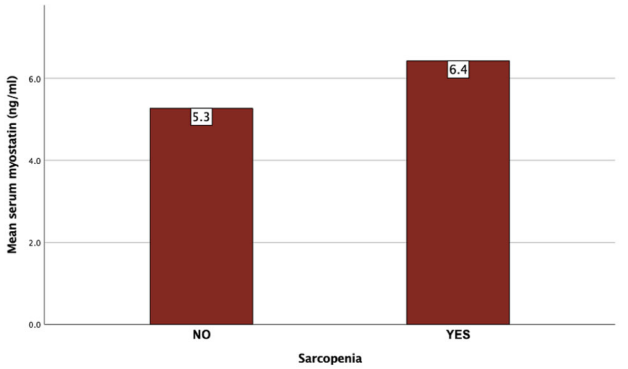
P728
LONG-LASTING AGGRESSIVE RHEUMATOID ARTHRITIS CAUSES SARCOPENIA THROUGH AN INCREASE IN THE SKELETAL MUSCLE ENZYME MYOSTATIN

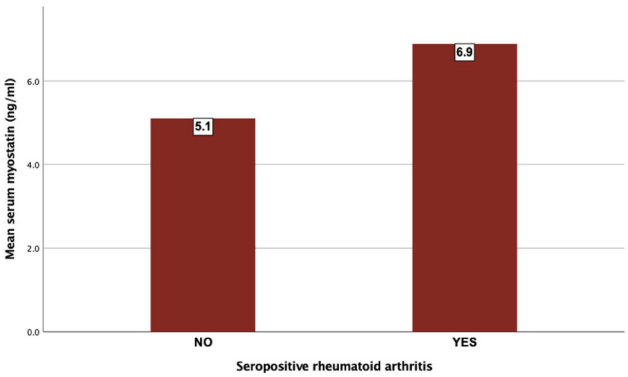
K. Zoupidou[1], M. Krikelis[2], D. Moschou[2], S. Tournis[3], K. Makris[4], S. Gazi[2], D. Boumpas[1], E. Chronopoulos[3], I. Dontas[3]

[1]Rheumatology and Clinical Immunology Unit, 4th Univ. Clinic of Internal Medicine, Attikon Univ. Hospital, [2]Rheumatology Dept., KAT General Hospital, [3]Laboratory of Research of the Musculoskeletal System, National and Kapodistrian Univ. of Athens, [4]Laboratory of Biochemistry, KAT General Hospital, Athens, Greece

Objective: Myostatin is a skeletal-muscle molecule with a negative influence in myogenesis. Chronic inflammation of rheumatoid arthritis (RA) has been associated with increased levels of serum myostatin (1). The aim of this study is to assess serum myostatin levels in RA patients and associate them with disease characteristics and sarcopenia parameters.
Methods: A case series study of 97 postmenopausal women with RA under treatment (1987 ACR criteria). Patient demographics and disease characteristics were recorded. Serum myostatin was calculated using the ELISA method. Patients underwent whole-body DXA to calculate lean skeletal muscle mass (ASMI). Handgrip strength was measured with a Jamar-type hand dynamometer. Physical performance was calculated with the Short Physical Performance Battery (SPPB) test. Sarcopenia was defined according to the revised EWGSOP criteria of 2019. Severe sarcopenia was recognised when all three defining parameters (ASMI, SPPB and handgrip strength) were low.
Results: Mean age was 65 ± 10 y and mean BMI was 29 ± 5 kg/m^2. Mean disease duration was 7 ± 3 y and 40% of the patients had seropositive disease. Mean DAS28 (ESR) was 3.8 ± 1.7 and mean HAQ-DI was 0.8 0.6. One-third of the patients (35%) suffered from sarcopenia, whereas 18% had severe sarcopenia. Mean serum myostatin levels were 5.9 ± 2.1 ng/ml. Increased serum myostatin levels were associated with the existence of sarcopenia (6.4 vs. 5.3 ng/ml, p = 0.012) and with seropositive disease (6.9 vs. 5.1 ng/ml,

$p < 0.001$). Patient functionality assessed with the HAQ-DI index was inversely associated with serum myostatin levels (-0.237, $p = 0.026$).





Conclusion: In this representative RA cohort, higher serum myostatin levels were associated with the presence of sarcopenia, an aggressive disease profile and lower patient functionality scores. These findings suggest that long-lasting aggressive rheumatoid arthritis might to sarcopenia through the upregulation of myostatin.

Reference: (1) Baig MH, et al. Front Physiol 2022;13:876,078.

P729
LOW-DOSE METHOTREXATE TREATMENT INCREASED RISK IN DEVELOPING OSTEOPOROSIS IN SKIN DISEASES: A POPULATION-BASED COHORT STUDY

K.-K. Tung[1], Y.-T. Wen[2], L.-L. Hseuh[3], C.-H. Lin[4], C.-H. Lee[1], S.-Y. Lin[5], K.-K. Chen[6], C.-S. Chiu[7]

[1]Dept. of Orthopedics, Taichung Veterans General Hospital, [2]Dept. of Education, Taichung Veterans General Hospital, [3]Dept. of orthopedics, Taichung Veterans General Hospital, [4]Taichung Veterans General Hospital, [5]Center for Geriatrics and Gerontology, Dept. of Internal Medicine, Taichung Veterans General Hospital, [6]Dept. of Orthopedics, Taichung Veterans General Hospital, [7]Dept. of Dermatology, Taichung Veterans General Hospital, Taichung, Taiwan

Objective: To determine the association between low-dose methotrexate (LD-MTX) treatment and the risk of osteoporosis and fragility fractures, particularly focusing on dermatological conditions. The study sought to elucidate the potential risks and benefits of LD-MTX therapy, especially concerning bone health and its influence on patients diagnosed with dermatological disorders.

Methods: The Osteoporosis Prevention Center (OPC) database from Taichung Veterans General Hospital was the primary data source. Patient records from December 1999 through August 2023 were meticulously reviewed. The study population was bifurcated based on LD-MTX administration. Eligibility was limited to subjects initiating LD-MTX treatment after a confirmed dermatological diagnosis. Patient characteristics and variables were statistically analyzed using ANOVA, chi-square tests, or Fisher's exact test. Both age and gender-stratified analyses were conducted.

Results: Out of 58,299 individuals, 2,342 were under LD-MTX treatment. A significant association between LD-MTX usage and elevated fragility fracture risk was found, especially in individuals aged 40–65 and in females. Chronic urticaria patients predominantly used LD-MTX. After adjustments, LD-MTX correlated with an adjusted HR of 2.59 for osteoporosis risk. Age-stratified analysis showed a significant association in both age brackets, while gender-stratified analysis revealed a pronounced association only in the female cohort.

Conclusion: There is a significant relationship between LD-MTX treatment and increased fragility fracture risk, predominantly in mid-aged individuals and females, especially those diagnosed with chronic urticaria. While the findings offer valuable insights, further comprehensive investigations are necessary to understand the underlying mechanisms and validate the results.

P730
ASSOCIATION BETWEEN OSTEOPOROSIS AND ALL-CAUSE MORTALITY IN HIP FRACTURE PATIENTS: A COMPREHENSIVE ANALYSIS

K.-K. Tung[1], K.-H. Chen[2], S.-Y. Lin[3], Y.-L. Deng[4], C.-E. Hsu[2]

[1]Dept. of Orthopedics, Taichung Veterans General Hospital, [2]Dept. of Orthopedics, Taichung Veterans General Hospital, [3]Center for Geriatrics and Gerontology, Dept. of Internal Medicine, Taichung Veterans General Hospital, [4]Dept. of Nursing, Taichung Veterans General Hospital, Taichung, Taiwan

Objective: To investigate the associations between osteoporosis and cause-specific mortality in a specific cohort of hip fracture patients within the general Asian population, using a comprehensive longitudinal database from Taiwan.

Methods: Participants were recruited exclusively from Taichung Veterans General Hospital's Osteoporosis Prevention Center, focusing on high-risk individuals who had DXA for BMD screening between 2011–2021. Mortality data were matched with death certificates using a probabilistic record linkage method. Cox proportional hazards models calculated hazard ratios (HR) and 95%CI for mortality risk.

Results: Among 2230 hip fracture patients, 1422 were alive, and 808 deceased during follow-up. Notable findings include significantly increased all-cause mortality risk for hip fracture patients with osteoporosis in femur (HR = 1.41, 95%CI: 1.13–1.77), spine (HR = 1.22, 95%CI: 1.02–1.43), overall BMD (HR = 1.28, 95%CI: 1.10–1.48), and TBS-spine (HR = 1.64, 95%CI: 1.01–2.67). Osteoporosis was significantly associated with higher cause-specific mortality, including cancer (TBS-spine, HR = 3.02, 95%CI: 1.12–8.12), cardiovascular disease (TBS-spine, HR = 3.10, 95%CI: 1.11–8.67), and diabetes (Femur aBMD, HR = 3.09, 95%CI: 1.53–6.27). Pulmonary-related mortality was significantly associated with osteoporosis, particularly in femur aBMD (HR = 1.81, 95%CI: 1.05–3.13).

Conclusion: Osteoporosis is significantly linked to an elevated risk of all-cause and specific-cause mortality, including cancer, cardiovascular disease, diabetes, and pulmonary issues, in a specific cohort of hip fracture patients within the general Asian population. These

findings emphasize early osteoporosis detection and management's importance in hip fracture patients, significantly impacting their long-term survival and specific cause-related mortality. Furthermore, this study sheds light on the persistent excess mortality associated with hip fractures, with substantial implications for public health and healthcare systems. Osteoporotic hip fractures pose significant health challenges due to increased mortality rates, lasting functional impairment in many patients, and substantial economic burdens on the National Health System. As life expectancy continues to rise, addressing the multifaceted consequences of hip fractures, including their long-term mortality trends, becomes increasingly imperative in healthcare planning and intervention strategies.

P731
EFFECTIVENESS OF VIRTUAL REALITY TECHNOLOGIES AND ROBOTIC MECHANOTHERAPY TRAINING IN IMPROVING THE FUNCTION OF MOVEMENT IN PATIENTS WITH COXARTHROSIS AND OSTEOPOROSIS AFTER HIP REPLACEMENT SURGERY

E. N. Ryabkov[1], L. A. Marchenkova[1]

[1]National Medical Research Center for Rehabilitation and Balneology, Moscow, Russia

Objective: To evaluate the impact of the training with virtual reality technologies and robotic training with biofeedback on the function of movement and the biomechanics of gate of patients with coxarthrosis and concomitant osteoporosis who underwent hip replacement surgery.
Methods: The study sample consisted of 80 men and women aged 60–85 y in the period from 5–30 weeks after hip replacement surgery due to coxarthrosis, with a T-score in the spine or collateral femur $\leq$ -2.5 according to DXA. Patients of the main group (n = 40) received a new rehabilitation complex, including training in virtual reality, robotic training with biofeedback and a special complex of strength and resistance exercises. The rehabilitation course for the control group (n = 40) included only complex of strength and resistance exercises. The examinations included assessment of pain intensity using a visual analogue scale (VAS), assessment of biomechanics and walking speed on a touch treadmill—C-Mill ergometer and functional tests.
Results: After completion of rehabilitation in the main group there were a decrease in pain level according to VAS was detected by 41.7% (p = 0.023 compared to the initial level, p = 0.047 compared to the control group), increase in walking speed (by 20.5%, p = 0.028) and a decrease in step width (by 8.2%, p = 0.048), which indicates the restoration of the physiological walking pattern. Also, in patients of the main group, a decrease in the time to complete the "Up and go" test was revealed from 15.6 [10.1; 16.4] to 13.2 [8.8; 13.0] sec (p = 0.043) and an increase in walking speed according to the 10-m test from 0.71 [0.5; 1.0] to 0.88 [0.8; 1.3] m/sec (p = 0.039), which indicates a significant improvement in functionality and mobility in patients. There were no significant changes in the pain intensity, speed and biomechanics of walking in the control group ($p > 0.05$).
Conclusion: A new rehabilitation complex, including methods of mechanotherapy with biofeedback and virtual reality, can be recommended for the rapid restoration of motor function and walking biomechanics after hip replacement in patients with coxarthrosis and concomitant osteoporosis.

P732
GATE AND BALANCE DISORDERS IN PATIENTS WITH TYPE 2 DIABETES MELLITUS: IMPACT OF DISTAL POLYNEUROPATHY

L. A. Marchenkova[1], V. A. Vasileva[1], G. G. Kuzminov[1]

[1]National Medical Research Center for Rehabilitation and Balneology, Moscow, Russia

Objective: To investigate the degree of impairment of gate and balance function in patients with type 2 diabetes mellitus (T2DM) and distal diabetic polyneuropathy (DPN).
Methods: The study included 120 patients with T2DM and distal DPN, age 57.0 [49.0; 61.0] years. A group of 60 practically healthy volunteers without DM was formed as a healthy control by gender and age. The complex of research methods included a study of the severity of DPN symptoms using the NSS neuropathy symptom scale and the NDS neurological dysfunctional score scale, assessment of gait biomechanics on a sensory track with C-Mill biofeedback, and functional tests for ambulation and balance assessment.
Results: In patients with DPN compared with persons without DM the time to complete the Up and go test was increased by 28.6% (9.0 [7.5; 10.5] vs. 7.0 [5.5; 8.5] sec, respectively, p = 0.032) and walking speed was reduced by 11.8% (1.5 [1.2; 1.7] vs. 1.7 [1.1; 2.1] m/sec, respectively, p = 0.023). According to the One leg standing test in patients with DPN compared with healthy volunteers there was a decrease in the time of maintaining balance on the left leg with eyes open by 43.8% (4.5 [2.0; 8.0] vs. 8. 0 [6.0; 12.0] sec, respectively, p = 0.035) and with eyes closed by 64.3% (1.0 [0; 3.0] vs. 2.8 [1.0; 3.5] sec, respectively, p = 0.040) and on the right leg with eyes closed – by 37.5% (2.5 [0; 3.0] vs. 4.0 [3.0; 5.5] sec, respectively, p = 0.012). Patients with DPN compared with healthy volunteers showed a decrease in walking speed by 16.0% (79.0 [68.0; 91.0] vs. 94.0 [77. 0; 100.0] steps/min, respectively, p = 0.028) and an increase in step width by 11.5% (184.0 [138.0; 235.0] mm vs. 165.0 [10.2; 186.0] mm, respectively, p = 0.041) according to on C-mill treadmill testing. The time to complete the up and go test correlated with the values of the NSS scale (r = 0.28, p = 0.033), the speed of covering a distance of 10 m depended on the severity of DPN symptoms on the NSS scale (r = -0.24, p = 0.04) and NDS scale (r = -0.28, p = 0.036).
Conclusion: A significant decreased walking speed, deterioration of gait biomechanics and static balance function were revealed in patients with DPN.

P733
VARUS DEFORMITY IS A FACTOR IN THE PROGRESSION OF KNEE OSTEOARTHRITIS

N. Kashevarova[1], L. Alekseeva[1], E. Strebkova[1], E. Taskina[1]

[1] V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To study the relationship of varus deformity of the knee with the risk of progression of knee osteoarthritis (OA) in a 5-y prospective follow-up.
Methods: The study involved 52 women with primary knee OA (ACR criteria), with a disease duration of up to 5 y (average age 59.11 $\pm$ 8.95 y, average disease duration of 3.46 $\pm$ 1.32 y). The patients were examined twice with an interval of 5 y, the data were entered into a specially designed map, including anamnestic, anthropometric and clinical data, assessment of knee pain according to VAS, X-ray, ultrasound and MRI of the knee.
Results: After 5 y of follow-up, the progression of knee OA (an increase in the X-ray stage) was noted in 14 patients, in 38 the OA stage did not change. Patients in both groups were comparable in age

and duration of the disease. However, patients in the group with OA progression had more intense pain 60.36 ± 18.33 vs. 48.71 ± 17.81, p = 0.043 (mm), a higher BMI of 34.45 ± 4.60 vs. 28.92 ± 4.92, p = 0.001 (kg/m^2) and varus deformity of the knee was more often detected 28.6% vs. 5.3%, p = 0.02. Using discriminant analysis, the main risk factors for the progression of knee OA were identified: varus deformity of the knee, synovitis, osteitis, and taking combination therapy of chondroitin sulfate (HC) and glucosamine (G) for more than 6 months a year for 5 y was identified as a factor reducing the risk of disease progression. Based on the identified factors and their coefficients, a model was created that allows predicting the course of the disease in a particular patient with high accuracy (the area under the ROC curve was—0.93). The sensitivity of the model is 78.6%, the specificity is 84.2%.

Conclusion: Varus deformity of the knee, synovitis, and osteitis are the main risk factors contributing to the progression of knee OA in patients with a disease duration of up to 5 y. Long-term use of a combination of HC and G had a positive effect on the risk of X-ray progression.

P734
RELATIONSHIP OF VITAMIN D AND OSTEOARTHRITIS: COMPARATIVE CLINICAL CHARACTERISTICS

N. Kashevarova[1], L. Alekseeva[1], E. Taskina[1], E. Strebkova[1], E. Sharapova[1], N. Savushkina[1], K. Mikhailov[1], S. Glukhova[1], N. Demin[1]

[1] V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To evaluate the relationship of vitamin D with clinical parameters in knee osteoarthritis (OA) in a single-stage study.

Methods: The study included 171 patients aged 40–75 y, with knee OA (ACR) of X-ray stage I-III (Kellgren–Lawrence). The average age was 53.5 ± 9.94 y, BMI was 29.8 ± 6.4 kg/m^2, and the duration of the disease was 3 [1; 7] y. An individual card was filled out for each patient, including anthropometric indicators, anamnesis and clinical examination data, assessment of knee pain according to VAS, WOMAC, and the patient's general health status (GSH). All patients underwent X-ray, ultrasound, MRI of the knee joints (WORMS) and laboratory examination.

Results: Normal vitamin D values (more than or equal to 30 ng/ml) were detected in 62 patients (36.3%) in group 1, decreased (< 30 ng/ml) in 109 patients (63.7%), while insufficiency (< 30 ng/ml, but > 20 ng/ml) was registered in 66 patients (38.6%) in group 2, and deficiency (< 20 ng/ml) in 43 (25.1%) in group 3. The patients of the three groups were comparable in age and duration of the disease, but significantly differed in weight and BMI (with a predominance in groups with reduced vitamin D values, $p < 0.05$). Also, these patients had significantly ($p < 0.05$) higher pain indicators for VAS, total WOMAC and its components (pain, stiffness and FN), GSH, and worse ($p < 0.05$) data on the KOOS index. More patients of groups 2 and 3 ($p < 0.05$) had hip OA, hand OA, synovitis, flat feet and quadriceps hypotrophy. Fewer patients ($p < 0.05$) engaged in physical therapy (exercise therapy) and took calcium and vitamin D, they more often had concomitant diseases: coronary heart disease (CHD), hypertriglyceridemia, arterial hypertension (AH).

Conclusion: Vitamin D deficiency is associated with a more severe course of knee OA. These patients had a higher BMI, higher pain values according to VAS, the WOMAC index (total and its components), worse indicators of KOOS, GSH. They were more likely to have X-ray stages 2 and 3 of knee OA, other localizations of OA, synovitis, quadriceps hypotrophy, flat feet and concomitant diseases: CHD, hypertriglyceridemia, AH.

P735
RELATIONSHIP OF VITAMIN D AND OSTEOARTHRITIS: COMPARATIVE LABORATORY AND INSTRUMENTAL CHARACTERISTICS

N. Kashevarova[1], L. Alekseeva[1], E. Strebkova[1], E. Taskina[1], E. Sharapova[1], N. Savushkina[1], K. Mikhailov[1], S. Glukhova[1], O. Alekseeva[1], D. Kudinsky[1], N. Demin[1], E. Samarkina[1]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective. To evaluate the relationship of vitamin D with laboratory and instrumental parameters in knee osteoarthritis (OA) in a single-stage study.

Methods: The study included 171 patients aged 40–75 y, with knee OA (ACR) of X-ray stage I-III (Kellgren–Lawrence). The average age was 53.5 ± 9.94 y, BMI was 29.8 ± 6.4 kg/m^2, and the duration of the disease was 3 [1; 7] y.

Results: Normal vitamin D (≥ 30 ng/ml) were detected in 62 patients (36.3%) group 1, decreased (< 30 ng/ml) in 109 patients (63.7%), while deficiency vitamin D (< 30 ng/ml, but > 20 ng/ml) was registered in 66 patients (38.6%) in group 2, and severe deficiency (< 20 ng/ml) in 43 (25.1%) in group 3. The patients of the groups were comparable in age and duration of the disease. Patients with vitamin D deficiency (groups 2 and 3) had higher concentrations of CRP, leptin, glycated hemoglobin, glucose, and alkaline phosphatase were more often recorded ($p < 0.05$ for all values). Ultrasound examination of patients in group 1 more often ($p < 0.05$) revealed large sizes of cartilage tissue both on the anteromedial and anterolateral surfaces of the knee; MRI (WORMS) less often ($p < 0.05$) revealed osteitis in the medial condyles of the femur and tibia (Table 1).

Table 1. The incidence of osteitis in patients with different vitamin D levels

Parameter	Normal vitamin D (n=62) (Group 1)	Vitamin D deficiency (n=66) (Group 2)	Vitamin D severe deficiency (n=43) (Group 3)	P
Osteitis in the medial condyles of the femur,%	5,72	20,0	33,3	*0,01
Osteitis in the medial condyles of the tibia,%	8,57	15	22,2	* 0,03

p* - significance between groups 1 and 2,3

Conclusion: Vitamin D deficiency is associated with a more severe course of knee OA. These patients were significantly more likely to have elevated values of CRP, alkaline phosphatase, leptin, smaller cartilage in the medial parts of the knee (ultrasound), they were significantly more likely to have osteitis (MRI) in the medial parts of femur and tibia.

P736
EFFICACY OF BIOACTIVE CONCENTRATE OF SMALL MARINE FISH IN PATIENTS WITH HAND OSTEOARTHRITIS

L. Alekseeva[1], E. Taskina[1], E. Strebkova[1], N. Kashevarova[1], A. Lila[1]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To evaluate the efficacy of SYSADOA (bioactive concentrate of small marine fish (BCSMF) containing chondroitin sulfate, amino acids, peptides, sodium, potassium, calcium, magnesium, iron, copper and zinc ions) in patients with hands osteoarthritis (OA) in a multicenter observational study.

Methods: The study included 2776 patients with hands OA according to the criteria of the ACR. The median age was 63 (56–70) y.o., BMI was 27.7 (25–31.2) kg/m^2, and VAS pain was 60 (41–70) mm. The duration of the study is from 20–31 d, the number of visits is 2: visit 1 (V1) – the beginning of therapy, visit 2 (V2) – within 10 d after the

completion of the 1st course of treatment. BCSMF was prescribed 1 ml intramuscular daily No. 20 or 2 ml intramuscular every other day No. 10.

Results: Against the background of one course of the drug, there was a significant decrease in pain (V1 – 52 [33; 70] and V2 – 14 [2; 30] mm, $p < 0.05$, Fig. 1), an improvement in the quality of life (EQ-5D), $p < 0.05$ and general health status (GHS), $p < 0.05$. The median reduction in pain (VAS) was 62.3%. Against the background of therapy, the need for NSAIDs also decreased: at the beginning of therapy, 53.6% of patients received these drugs, at the end of treatment 49.8% ($p = 0.01$). Good response to therapy (pain reduction by 50% or more) it was detected in 73.5%; pain reduction of < 40 mm in 87.6% of patients. Older age, more severe X-ray manifestations of OA, high pain intensity and worse indicators of GHS, low quality of life and concomitant pathology were associated ($p < 0.05$) with a lower effect of therapy in hand OA (pain reduction by < 50%).

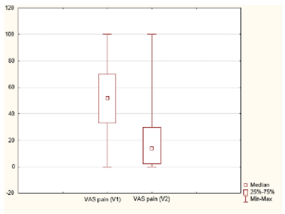


Fig. 1 – Dynamics of pain (VAS) in hand OA against the background of drug treatment

Conclusion: The results of the use of BCSMF in hand OA indicate the expediency of its widespread use in real clinical practice. Taking into account and correcting factors associated with a less pronounced analgesic effect of the drug will improve the efficacy of OA therapy.

P737
COMPARATIVE CLINICAL CHARACTERISTICS OF METABOLIC AND OSTEOPOROTIC PHENOTYPES OF KNEE OSTEOARTHRITIS

L. Alekseeva[1], E. Strebkova[1], N. Kashevarova[1], E. Taskina[1], N. Savushkina[1], E. Sharapova[1], K. Mikhailov[1], A. Khalmetova[1], A. Lila[1]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: A comparative analysis of clinical indicators of metabolic (MetOA) and osteoporotic (OP) phenotypes of osteoarthritis (OA) of the knee joints (KJ).

Methods: The study included 195 patients with MetOA (metabolic syndrome and/or type 2 diabetes mellitus) and 176 with OP (with reduced BMD: the presence of osteoporosis or osteopenia in the axial skeleton), with a reliable diagnosis of knee OA (criteria of the ACR) of stage I-III (Kellgren-Lawrence).

Results: Patients of both groups did not differ in age ($p = 0.36$) and duration of the disease ($p = 0.26$), however, patients with MetOA compared with OP had statistically significantly a heavier course of OA: movement restriction was more often determined in KJ (RR = 1.811, 95%CI 1.388–2.363, $p = 0.001$), quadriceps hypotrophy (RR = 1.556, 95%CI 1.193–2.029, $p = 0.005$), higher pain values for VAS, total WOMAC and its components (pain, stiffness and FN), worse the values of KOOS and general state health (GSH) (Table 1). In patients with OP, the first radiological stage of OA was more often determined (RR = 0.257, 95%CI 0.131–0.507, $p < 0.001$) compared with MetOA, in whom more advanced radiological stages were more often verified (RR = 1.633, 95%CI 1.249–2.136, $p = 0.04$). With OP, flat feet and scoliosis of the spine were more often detected. These results demonstrate a more severe course of patients with MetOA.

Table 1. Comparative clinical characteristics of patients with metabolic and osteoporotic phenotypes of OA

Parameter	Patients with MetOA (n=195)	Patients with OP (n=176)	p
The pain is VAS, mm, Me	40 [25; 52]	20 [2,5; 30]	<0,001
Pain WOMAC, mm, Me	170 [118; 250]	112 [42; 157]	<0,001
Total WOMAC, mm, Me	880 [595; 1215]	457 [205; 820]	<0,001
KOOS, points, Me	48 [37; 58]	57 [49; 77]	0,002
Flat feet,%	69,4%	83,9%	0,01
Scoliosis of the spine,%	45,6%	72,4%	0,001

Conclusion: The results of our work demonstrate a more severe clinical course of knee MetOA. In this regard, therapeutic measures should include both nonpharmacological and pharmacological interventions aimed not only at OA, but also at all components of metabolic syndrome, which will help slow the progression of the disease.

P738
KNEE OSTEOARTHRITIS IN PATIENTS WITH OBESITY AND NORMAL BODY WEIGHT: COMPARATIVE CHARACTERISTICS OF CLINICAL AND LABORATORY PARAMETERS

L. Alekseeva[1], E. Strebkova[1], E. Taskina[1], N. Kashevarova[1], N. Savushkina[1], E. Sharapova[1], K. Mikhailov[1], A. Khalmetova[1], A. Lila[1], T. Raskina[2], J. Averkieva[2], E. Usova[2], I. Vinogradova[3], O. Salnikova[3], A. Markelova[3]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, [2]Kemerovo State Medical Univ., Kemerovo, [3]Ulyanovsk Regional Clinical Hospital No. 1, Ulyanovsk, Russia

Objective: To evaluate the effect of high BMI on the clinical course of knee osteoarthritis (OA) in a multicenter program.

Methods: The study included 495 patients aged 40–75 y with a reliable diagnosis of knee OA (ACR) of stage I-III (Kellgren-Lawrence) who signed an informed consent. The average age of the patients was 60.5 ± 8.33 y (from 40–75), the duration of the disease was 7 (3–14) y.

Results: Obesity (BMI > 30 kg/m^2) was detected in 244 individuals (49.3%). According to the presence or absence of a high BMI, patients were divided into 2 groups. Obese patients were older and had a longer duration of OA. Statistically significant differences were revealed when evaluating the clinical manifestations of OA. In patients with high BMI, a more pronounced intensity of knee pain (VAS), worse pain indicators and all the constituent parameters of the WOMAC and KOOS ($p < 0.05$). Obese patients had more often detected ($p < 0.05$): synovitis, knee flexion restriction, hypotrophy quadriceps, knee varus deformity, flat feet and the generalized form of OA. In a laboratory study, higher concentrations of CRP, leptin and IL-6 were determined in obese patients ($p < 0.05$ for all values). Spearman correlation analysis ($p < 0.05$) confirmed the relationship between high BMI and duration of OA ($r = 0.24$), radiological stages ($r = 0.31$), generalized form of OA ($r = 0.13$), pain according to VAS ($r = 0.21$) and WOMAC ($r = 0.27$), KOOS ($r = 0.25$). Significant positive associations were also noted with the following laboratory parameters: CRP ($r = 0.41$), leptin ($r = 0.66$) and IL-6 ($r = 0.31$).

Conclusion: The results obtained demonstrate the important role of obesity as predictors of severe OA. Obese patients have high pain values according to VAS, according to the WOMAC and KOOS index, higher concentrations of inflammatory mediators (CRP), adipokines (leptin) and cytokines (IL-6). Given the growth rate of the obesity pandemic in the world, it is necessary to optimize the treatment algorithms for patients with obesity and knee OA.

P739
DYNAMIC PARAMETERS OF PROXIMAL FEMORAL DYSPLASIA IN INNATE DISLOCATION IN CHILDHOOD AND ADOLESCENCE

L. Ametova[1], A. Useinova[1], V. Kaliberdenko[1], E. Kulieva[1]

[1]V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: The study of the features of hip dysplasia in different age groups gives an idea of the choice of conservative or surgical methods of intervention in children with congenital dislocation.
Methods: 990 radiographs of 178 joints of children with congenital hip dislocation aged from 1–14 y were studied. Radiometry of linear and angular values of the hip joint was performed, as well as a study of the bioelectric activity of the muscles surrounding the hip joint.
Results: As a result of the study, it was determined that the cervical-diaphyseal angle is mainly increased in preschool children (150,1° ± 15,8–148,8° ± 15,6), and it normalizes or slightly elevated at an older age (up to 136.2 ± 3.21°). The magnitude of the Shenton line gap was also determined. In the age group from 1–3 y, it was 20.3 ± 1.22 mm, and tends to increase with the age of patients. Thus, in the group from 11–14 years old, the gap of the Shenton line was 39.0 ± 8.13 mm. This indicates a shortening and an increase in the tone of the pelviotrochanter muscles, which was confirmed by an electromyogram. There is also the horizontal size of the ossification nucleus increases with the age of the patient: 1–3 y -12.5 ± 0.91 mm, 4–5 y—18.7 ± 0.63 mm, 6–7—25.3 ± 1.48 mm, 8–10—32.0 ± 3.11 mm, 11–14 y—31.7 ± 3.32 mm. The antetorsion of the proximal end of the femur reaches its maximum in children aged 5 y and is 65.3 ± 1.65°, and in subsequent age groups it decreases to 54.2 ± 4.2°.
Conclusion: This study confirms the importance of early diagnosis of congenital hip dislocation, since when this pathology is detected at the age of 1 y, it remains possible to perform closed hip reduction, which is quite effective.

P740
PROGNOSIS OF DEVELOPMENT OF INNATE FEMORAL DYSPLASIA BY X-RAY MARKER

L. Ametova[1], A. Useinova[1], V. Kaliberdenko[1], E. Kulieva[1]

[1]V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: The frequency of diagnosis of congenital hip dysplasia occurs in up to 6.5% of all newborns and there is a need to predict the course of pathology in order to choose the right tactics in each individual case.
Methods: 608 radiographs of 152 joints of children with congenital hip dislocation aged 1–5 y were studied.
Results: The analysis of the main parameters of femoral joint was determined: the lumbosacral synchondrosis (LSS), the acetabular index (AI), the thickness of the iliac bone and the bottom of the acetabulum, the cervical-diaphyseal angle (CDA).The significance of the correlation matrix data was verified using the Kolmogorov–Smirnov criterion (n = 100, a = 0.05). It turned out that the size of the LSS has a significant correlation with the indicators of the dysplastic joint: the larger the size of the LSS, the smaller the thickness of the iliac bone body, the bottom of the acetabulum, and the size of the femoral head. The correlation of radiographic parameters in the age groups 1–2 and 3–5 y was studied. The data obtained indicate the high informativeness of the linear values of the LSS. However, this value correlated differently depending on the age group. So, in the first age group (n = 50), using the example of the thickness of the acetabulum bottom, there is a direct moderate (0.3) correlation, and in the second—a weak reverse (-0.19).
Conclusion: Surgical interventions for congenital hip dislocation in children, such as acetabuloplasty or osteotomy, are very traumatic methods of correcting this pathology and should be justified. Therefore, the conducted study allows the orthopedist to reliably predict the possibility of independent hip joint development in children when choosing the optimal treatment tactics based on the indicator of linear values of LSS.

P741
PATHOGENESIS OF GLUCOCORTICOIDS OSTEOPOROSIS

E. Kuliyeva[1], V. Kaliberdenko[1], L. Ametova[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: Glucocorticoids are steroid hormones synthesized by the adrenal cortex. The glucocorticoids are used in medicine as anti-inflammatory, immunosuppressive, anti-allergic and anti-shock drugs. However, prolonged using of these hormones can cause of structural and functional changes of bones or osteoporosis that develops in 30–50% of cases.
Methods: The analysis of research and scientific and literary materials of foreign authors working on the study of glucocorticoids and their depiction on bone density.
Results: The Pathogenesis of glucocorticoid osteoporosis begins from the first weeks of therapy with glucocorticosteroids, as the result the absorption of calcium in the intestine decreases while in the renal tubules the reabsorption of the same element is decrease. In addition, there is a hyperparathyroidism, which occurs in most patients at the stage of hormone therapy, contributes to the leaching of calcium from bones. The glucocorticoids also decrease the functional activity and differentiation of osteoblasts. Hormones inhibit the synthesis of type I procollagen, which makes up to 90% of the organic bone matrix. Together with the suppression of bone formation, the drugs stimulate the activity of osteoclasts, which enhance bone resorption. This process realizes by expression of nuclear factor RANKL and macrophage colony stimulating factor. In the pathogenesis of glucocorticoid osteoporosis, an important role is played by the disorders of metabolism of the sex hormones that increases bone resorption.
Conclusion: In spite of the fact that glucocorticoids are included in the arsenal of modern therapy of the different diseases, it is necessary not to forget about the risk of possible complications, one of which is glucocorticoid induced osteoporosis.

P742
ROMOSOZUMAB AS A SCLEROSTIN INHIBITOR IN OSTEOPOROSIS TREATMENT

E. Kuliyeva[1], V. Kaliberdenko[1], L. Ametova[1]

[1]V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: Osteoporosis is a multifactorial disease, with predominant damage and destruction of bone tissue by the type of "leaky bone", characterized by a violation of the mechanical and biophysical properties of bone, due to which bone tissue loses its elasticity and strength. Maintaining the health of the bone system is primarily associated with the use of pharmacological therapy for this purpose in 2019, romosozumab that approved by the US Food and Drug Administration as an inhibitor of sclerostin.
Methods: The analysis of research and scientific literary materials of foreign authors working on the study of osteoporosis and treatment.
Results: Romosozumab is a human monoclonal antibody (IgG2) formed in a mammalian cell line, more precisely in the ovary of a Chinese hamster using recombinant DNA technology. By inhibiting

the sclerostin, it enhances the anabolic processes of bone tissue and reduces its resorption. In comparison with other osteoanabolic drugs, romosozumab has a large anabolic window and has a greater effect on increasing BMD. According to the Cochrane meta-analysis, 6137 patients who took romosozumab for a year at a dose of 210 mg once a month subcutaneously showed a decrease in the frequency of vertebral fractures, fractures of other localization and the risk of falls after 24 months. BMD in the lumbar spine, as well as the entire hip and hip neck, compared with the baseline level, increased by 12.5 ± 2.4% and 5.5 ± 0.7% after 12 months, respectively. According to Langhdal B et al. (2022), taking romosozumab at the same dose for 12 months reduced the risk of vertebral and clinical fractures. The study shows that in the phase IIIb, the drug significantly increased BMD after 12 months of using. At the same time, the clinical effect persisted for 12–24 months.
Conclusion: Using of romosozumab in the treatment of osteoporosis is highly effective that confirmed by a number of large-scale studies.

P743
IMPACT OF OBESITY ON BONE RESORPTION

E. Kuliyeva[1], V. Kaliberdenko[1], L. Ametova[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: Obesity is the result of the formation of excess body fat and, as a rule, accompanied by metabolic syndrome, the main criterion of which is abdominal obesity, characterized by a waist circumference of more than 80 cm in women and more than 94 cm in men. There is evidence that obesity can affect bone resorption.
Methods: The analysis of research and scientific literary materials of foreign authors working on the study of obesity, osteoporosis and bound between them.
Results: According to research, changes in body weight better reflect the dynamics of BMD compared to BMI. Obesity may be associated not only with nutritional errors, but also with increased levels of PTH, which also increases bone formation by protecting osteoblasts from apoptosis in rodent models. The positive effect of obesity on skeletal growth and bone density in children was revealed, i.e., with an increase in the base body fat mass, bone mass and area increased. During the studying, the frequency of fractures in people with excess fat mass founded that excess fat mass protected against both total fractures and osteoporotic fractures. Probably these processes are associated with hyperinsulinemia, both insulin, as well as amylin secrete together and strongly inhibit bone resorption. Glucose-dependent insulinotropic polypeptide (GIP), which enhances postprandial insulin secretion, is also associated with this process. Despite the fact that GIP does not directly affect bone resorption, he stimulates the proliferation of osteoblasts, and therefore reduces bone loss. In patients with hyperinsulinemia, the free concentration of sex hormones in the blood increases, which affects osteoclast and osteoblast activity. According to the data, the risk of vertebral fractures is reduced by 50% in people with insulin resistance.
Conclusion: Despite the fact that obesity reduces the number of fractures and injuries by affecting bone resorption by inhibiting it, should not forget that obesity itself serves as a predictor of many diseases.

P744
CRITERIA FOR ASSESSING RISK OF THROMBOEMBOLIC COMPLICATIONS IN LIMB FRACTURES

A. Useinova[1], V. Kaliberdenko[1], L. Ametova[1], E. Kuliyeva[1]

[1]V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: Developing of the criteria for the prognosis of venous thromboembolic complications (VTEC) in case of limb fractures.
Methods: 74 patients aged 18–44 y with fractures of the lower extremities were studied. Group 1—44 patients with common fractures, Group 2—30 patients with VTEC. The control group consisted of 100 healthy men and women. Patients with concomitant diseases and women during menstruation and menopause were excluded. Clinical, laboratory and instrumental parameters were studied. The examination was carried out within 10 d after surgery using the IBM SPSS Statistics Version 25.0 program for statistical processing of the results.
Results: Based on the results of binary logistic regression, the most informative indicators were included in the equation: lymphocyte-platelet adhesion (LTA), international normalized ratio (INR) and D-dimer, and their significance was determined. The developed prognostic model has a sensitivity of 0.97, specificity of 1.0, $p < 0.001$. Based on these data, a computer program was created to determine the risk of developing VTEC in fractures. The user enters the LTA, INR and D-dimer concentrations in the user window, the program shows the result: a red window for high risk and a green window for low risk. It helps determine the risk of VTEC in fractures and improve patient treatment tactics.
Conclusion: Determining the LTA index, INR and D-dimer concentration in patients with fractures of long bones of the extremities and carrying out calculations using the proposed computer program can allow timely determination of the risk stratification of an unfavorable outcome and implementation of timely preventive measures.

P745
PREDICTORS AND RISK FACTORS FOR LOW-ENERGY FRACTURES IN NON-INSULIN-DEPENDENT DIABETES MELLITUS

A. Useinova[1], L. Ametova[1], V. Kaliberdenko[1], E. Kuliyeva[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: Evaluation of risk factors for low-energy fractures (FFE) in postmenopausal patients with type 2 diabetes mellitus (T2DM).
Methods: Among 81 patients with type 2 diabetes, two groups were divided: 35 people with low-energy fractures and 46 people without fractures. Exclusion criteria included diseases causing osteoporosis and taking medications that affect bone density. Patients were examined on a variety of parameters, including plasma concentrations of various substances (total alkaline phosphatase, creatinine, etc.), analysis of bone metabolism and assessment of chronic diseases.
Results: The 35 patients in group 1 had 55 fractures, for an average of 1 fracture per person. The most common fracture sites were the radius (32.72%) and tibia (25.45%). Patients with neuropathy had significantly higher postmenopausal duration, blood phosphorus levels, and duration of insulin therapy. According to ROC analysis, in postmenopausal patients with T2DM, the likelihood of developing NEP

increased with a postmenopausal duration of > 15 y, a phosphorus level above 1.48 mmol/l, and a duration of insulin therapy of > 3 y. Literary data also indicate a risk of falls due to an increase in the frequency of hypoglycemia with insulin therapy and deterioration in bone quality, which increases the risk of fractures in patients with decompensated type 2 diabetes. There was no relationship between complications of type 2 diabetes, classes of glucose-lowering therapy, duration of the disease, BMI, values HbA1c, sclerostin, cathepsin K, CIRS and the presence of NES in the examined patients.
Conclusion: The most significant risk factors for the development of NEP in postmenopausal patients with type 2 diabetes mellitus were the duration of postmenopause, the duration of insulin therapy for > 3 y and an increase in blood phosphorus.

P746
DEVELOPMENT OF RHEUMATOID ARTHRITIS, AN AUTOIMMUNE MUSCULOSKELETAL DISEASE, AFTER SARS-COV-2 INFECTION

L. Athanassiou[1], P. Tsakiridis[2], P. Athanassiou[2], I. Kostoglou-Athanassiou[3], Y. Shoenfeld[4]

[1]Dept. of Rheumatology, Asclepeion Hospital, Voula, Athens, Greece, [2]Dept. of Rheumatology, St. Paul's Hospital, Thessaloniki, Greece, [3]Dept. of Endocrinology, Diabetes and Metabolism, Asclepeion Hospital, Voula, Athens, Greece, [4]Zabludowicz Center for Autoimmune Diseases, Sheba Medical Center, Reichman Univ., Herzelia, Israel

Objective: The SARS-CoV-2 virus has been related to the development of autoimmunity. Mechanisms possibly involved are molecular mimicry and the development of extracellular neutrophil traps. The aim was to describe two cases of patients who developed seropositive rheumatoid arthritis (RA) shortly after infection with the SARS-CoV-2 virus.
Methods: The cases of two female patients are described who developed late onset RA after COVID-19 infection.
Results: The first patient, aged 79, presented with arthralgias of the large joints and morning stiffness 2 months after COVID-19 infection. On clinical examination arthritis of the right shoulder and the left 3rd metacarpophalangeal joint was observed along with limited mobility of both knee joints. Laboratory examinations revealed ESR 75 mm, CRP 1.48 mg/dl (normal values < 5 mg/dl), RF 256.6 U/ml (< 30 U/ml), anti-CCP 584 U/ml (< 5 U/ml). Late onset seropositive RA was diagnosed. Prezolon 7.5 mg/d and hydroxychloroquine 200 mg/d were administered with significant improvement. The second patient, aged 74, developed diffuse arthralgias and morning stiffness 7 months after COVID-19 infection. She had symmetric polyarthritis with tender and swollen carpal, metacarpophalangeal and proximal interphalangeal joints in both hands. Laboratory evaluation revealed ESR 44 mm, CRP 1,16 mg/dl (< 0,5 mg/dl), RF 23,8 U/ml (< 30 U/ml), anti-CCP > 200 U/ml (< 5 U/ml), ANA 1/1280. Low dose corticosteroids and methotrexate 12.5 mg/week were administered with improvement.
Conclusion: The development of seropositive RA after clinical COVID-19 infection is described. The SARS-CoV-2 virus may be related to the development of clinical autoimmune disease.

P747
SEVERE OSTEOPOROSIS LEADING TO MULTIPLE FRACTURES IN THE CONTEXT OF MULTIPLE SCLEROSIS

L. Athanassiou[1], P. Athanassiou[2], D. Begkas[3], G. Georgiadis[4], A. Pastroudis[3], E. Manta[3], I. Kostoglou-Athanassiou[5]

[1]Dept. of Rheumatology, Asclepeion Hospital, Voula, Athens, [2]Dept. of Rheumatology, St. Paul's Hospital, Thessaloniki, [3]6th Dept. of Orthopedics, Asclepeion Hospital, Voula, Athens, [4]4th Dept. of Orthopedics, Asclepeion Hospital, Voula, Athens, [5]Dept. of Endocrinology, Diabetes and Metabolism, Asclepeion Hospital, Voula, Athens, Greece

Multiple sclerosis is an autoimmune demyelinating disease which may affect patient mobility. The disease is characterized by autoimmune etiology. The aim was to present the case of a patient with multiple sclerosis who developed severe osteoporosis with multiple fractures.
Case report: A patient, female, aged 52 y, presented with multiple sclerosis. She was treated with corticosteroids and interferon beta-1a. Approximately 10 y later she presented with a fracture of the right hip. She was treated surgically and recovered. Her mobility improved. Subsequently, approximately 2 y later she presented with a fracture of the left hip. She was treated surgically. BMD measurement was performed. T-score was -3.8. The patient was given effervescent alendronate 70 mg once weekly, calcium and vitamin D supplements and alphacalcidol 1 μg daily. A year later BMD measurement was performed and T-score was -3.4. The patient's mobility is compromised, as after the bilateral surgical procedures her right foot is a little shorter than the left. Physiotherapy was prescribed.
Conclusion: The case of a female patient with severe osteoporosis and multiple sclerosis is presented. Multiple sclerosis is known to be associated with severe osteoporosis. Osteoporosis in the context of multiple sclerosis is thought to be due to mobility limitations as well as to the immune modulating treatment for the autoimmune process. The presence of depression may also be related to osteoporosis in the context of multiple sclerosis. However, recent findings implicate the inflammatory nature of the disease as well as cardiovascular autonomic nervous dysfunction which affects bone homeostasis via neuronal, systemic and local mediators.

P748
TUMOUR-INDUCED OSTEOMALACIA MIMICKING SEVERE OSTEOPOROSIS WITH MULTIPLE FRACTURES

L. Brunerova[1], J. Ferda[2], J. Hrudka[3], S. Batek[4], R. Pichova[4], M. Chovanec[5]

[1]Faculty Hospital Kralovske Vinohrady and 3rd Faculty of Medicine, Dept. of Medicine, Prague, [2]Dept. of Radiology, Faculty Hospital and Faculty of Medicine Plzen, Plzen, [3]Dept. of Pathology, Faculty Hospital Kralovske Vinohrady and 3rd Faculty of Medicine, Prague, [4]Dept. of Radiology and Nuclear Medicine, Third Faculty of Medicine, Charles Univ. in Prague and Faculty Hospital Kralovské Vinohrady, Prague, [5]Dept. of Otorhinolaryngology, Charles Univ., 3rd Faculty of Medicine and Univ. Hospital Kralovske Vinohrady, Prague, Czech Republic

Tumour-induced osteomalacia (TIO) is a rare paraneoplastic syndrome characterized by bone pain, fractures and muscle weakness,

caused by overproduction of FGF23 in usually small benign mesenchymal tumour, location of which is challenging but crucial since complete removal is curative.

Case report: A 75-year old man has been suffering from gradually progressive pain of ribs and long bones since 2019. In June 2023, CT revealed multiple rib fractures and multiple osteolytic lesions in vertebras suspicious of either from hematologic malignancy or prostate cancer. Nonetheless, both of them were excluded. Due to BMD femoral neck (T-score -3.0) he was referred as osteoporosis with multiple fractures. At the examination, he was sarcopenic with decreased muscle strength, practically immobile (moving on the wheel chair) with thoracic brace. Laboratory examination revealed normal serum calcium but very low serum phosphate (0.4 mmol/l), increased urinary phosphate (40 mmol/l), normal parathormone and vitamin D. FGF-23 was 324 (normal range up to 95,4 ng/L) confirming the diagnosis of TIO. Treatment with 1,25-dihydroxycholecalciferol (1.5 mg daily) together with phosphate solution had, however, minimal effect on serum phosphate level. DOTATOC PET CT revealed the picture of Milkman´s syndrome with two suspicious lesions in right maxilla and near sphenoid bone. MRI described the latter one as meningioma. At otorhinolaryngology, subtotal maxillectomy was performed leading to immediate normalization of FGF23 levels. Histology confirmed phosphaturic mesenchymal tumour expressing FGF23.

Conclusion: The case represents a rare condition of TIO caused by phosphaturic mesenchymal tumour of maxilla, which was curatively removed, and thus emphasizes the urgency for proper differential diagnosis of low BMD with multiple fractures.

P749
EXPLORING PATIENT AND CLINICIAN UNDERSTANDING OF BONE DENSITY (DXA) SCAN RESULTS: A QUALITATIVE STUDY

C. Kettle[1], J. Butterworth[2], J. Griffin[3], B. Henderson[4], C. Jinks[1], K. Knapp[5], F. Manning[5], L. Bullock[1], Z. Paskins[1]

[1]School of Medicine, Keele Univ., Newcastle-under-Lyme, [2]Exeter Collaboration for Academic Primary Care (APEx), Univ. of Exeter Medical School, Exeter, [3]Healthy Bones Service, Derriford Hospital, Univ. Hospitals Plymouth NHS Trust, Plymouth, [4]Keele Univ. Research User Group, Keele Univ., Newcastle-under-Lyme, [5]Faculty of Health and Life Sciences, Exeter Univ., Exeter, UK

Objective: Patient and clinician understanding of DXA scans and results is integral to support clinical decision-making and adherence to osteoporosis medicines. The INDEX (understandINg bone DEnsity [dXa] scans) study aims to explore patient and clinician understanding of DXA scans and results.

Methods: Semi-structured think-aloud interviews with patients and clinicians about views of DXA scans and results. Patients attending DXA scans across 3 NHS sites are invited to interview. Clinicians are recruited via existing clinical networks and the Clinical Research Network. Framework analysis, informed by the common-sense model of illness self-regulation, facilitates understanding of people's perceptions of, and responses to, DXA results.

Results: 24 patient and 12 clinician (11 primary care; 1 secondary care) interviews. Recruitment and analysis are ongoing. Many patients reported having uncertainties about clinical terminology and numeric scores within clinical reports (e.g., T-scores and fracture risk). Varying patient preferences were discussed in relation to receiving numeric results. Clinicians often preferred not to discuss numerical results because they (1) lacked clinical knowledge to interpret and communicate results and/or (2) believed that patients would not understand them. To address this, clinicians suggested development of accessible guidance to support knowledge and visual support tools to help communicate results. Some patients discussed uncertainty relating to (1) what the scan entailed, (2) how/when they would receive their DXA results (3) treatment options and/or how to take medication (4) if and/or when a follow-up DXA scan was needed. Patients wanted further resource around this to establish clear next steps. Likewise, clinicians expressed uncertainty regarding patient treatment management, particularly long-term bisphosphonate use and intolerances to first-line treatment.

Conclusion: Patients and clinicians have uncertainties about DXA scans and results, highlighting opportunities to enhance understanding; these results will inform co-production of resources to support DXA understanding.

Acknowledgement: This study is funded by the Royal Osteoporosis Society (REF 478).

Disclosures:
ZP is funded by the NIHR [Clinician Scientist Award (CS-2018–18-ST2-010)/NIHR Academy] and has received consultancy fees and grant funding from UCB Pharma. FM is part funded by the NIHR Applied Research Collaboration South West Peninsula. CJ is part funded by NIHR Applied Research Collaboration West Midlands. JB is funded by an NIHR Academic Clinical Lectureship.

P750
SUPPORTING SHARED DECISION-MAKING ABOUT OSTEOPOROSIS MEDICINES: COMBINING MULTIPLE METHODS TO DEVELOP THE PROTOTYPE IFRAP INTERVENTION

L. Bullock[1], J. Fleming[2], E. M. Clark[3], S. Leyland[4], S. Thomas[5], C. Gidlow[6], T. W. O'Neill[7], C. P. Iglesias-Urrutia[8], A. Hawarden[9], F. Manning[10], J. Protheroe[1], J. Lefroy[1], S. Ryan[11], R. Horne[12], C. Mallen[1], C. Jinks[1], Z. Paskins[9]

[1]Centre for Musculoskeletal Health Research, School of Medicine, Keele Univ., Stoke-on-Trent, [2]Cambridge Public Health, Univ. of Cambridge & Cambridge Univ. Hospitals NHS Trust, Addenbrooke's Hospital, Cambridge, [3]Bristol Medical School, Univ. of Bristol, Bristol, [4]Royal Osteoporosis Society, Bath, [5]Prescribing Decision Support Ltd, Congleton, [6]Centre for Health and Development (CHAD), Staffordshire Univ., Stoke-on-Trent, [7]Centre for Epidemiology Versus Arthritis, Univ. of Manchester & NIHR Manchester Biomedical Research Centre, Manchester Univ. NHS Foundation Trust, Manchester, [8]Dept. of Health Sciences, Univ. of York, York, [9]Centre for Musculoskeletal Health Research, School of Medicine, Keele Univ. & Haywood Academic Rheumatology Centre, Haywood Hospital, Midlands Partnership Univ. NHS Foundation Trust, Stoke-on-Trent, [10]Univ. of Exeter Medical School, Exeter, [11]School of Nursing and Midwifery, Keele Univ. & Haywood Academic Rheumatology Centre, Haywood Hospital, Midlands Partnership Univ. NHS Foundation Trust, Stoke-on-Trent, [12]Centre for Behavioural Medicine, UCL School of Pharmacy, Univ. College London, London, UK

Objective: The iFraP (improving uptake of fracture prevention drug treatments) study developed an osteoporosis decision aid (DA) to improve shared decision-making (SDM) and medicine adherence in Fracture Liaison Services (FLSs). This abstract details the multi-method development of the prototype iFraP intervention.

Methods: Four substudies guided intervention development: 1) review of the quality of existing osteoporosis Das; 2) review of osteoporosis patient information; 3) Delphi survey to gain consensus on intervention content, informed by relevant clinical guidelines and behavioural theories; and 4) focus groups and supplementary interviews with patients and clinicians to explore current practice, and barriers and facilitators to change. Expert stakeholders and public contributors informed the design and output of each substudy.

Results: Studies 1 and 2 found existing osteoporosis DAs and patient information to have poor readability and variable quality. Study 3 identified essential consultation components. Findings from studies 1–3 informed iFraP DA content e.g. inclusion of understandable explanations of osteoporosis medicines. Study 4 identified the need for complementary resources, training, and potential barriers to DA use. Patients and clinicians expressed the need for a patient-friendly individualised consultation summary to facilitate understandable and consistent information. This finding informed development of an individualised, easy-read print-out of the iFraP DA. Training needs included communicating risk and involving patients in decisions. Clinicians were concerned that SDM may undermine their goal to facilitate medicine adherence. These findings informed training content and delivery, with consideration of theoretically informed behaviour change techniques.
Conclusion: The iFraP study demonstrates the use of multiple methods to develop an evidence-based and theoretically informed intervention to facilitate SDM in FLSs, in preparation for testing.
Acknowledgements: This study is funded by the NIHR [Clinician Scientist Award (CS-2018–18-ST2-010)/NIHR Academy], the ROS, and the Haywood Foundation. The views expressed are those of the authors and not necessarily those of the NHS, the NIHR, or the Department of Health and Social Care.
Disclosures:
ZP is funded by the NIHR [Clinician Scientist Award (CS-2018–18-ST2-010)/NIHR Academy] and has received consultancy fees and grant funding from UCB Pharma. ST is a director at Prescribing Decision Support Ltd that supported development of the iFraP decision aid. TON is supported by the NIHR Manchester Biomedical Research Centre. CM is funded by the NIHR Applied Research Collaboration West Midlands and the NIHR School for Primary Care Research. CJ is part funded by NIHR Applied Research Collaboration West Midlands. AH is funded by a Versus Arthritis Clinical Research Fellowship (ref: 22,726). FM is part funded by the NIHR Applied Research Collaboration South West Peninsula.

P751
OSTEOPOROSIS: COMORBIDITY IN ANKYLOSING SPONDYLITIS

L. Chişlari[1], L. Groppa[1], E. Russu[1], A. Nistor[1], L. Gonţa[2]

[1]"Nicolae Testemitanu" State Medical and Pharmaceutical Univ., [2]Republican Diagnostic Center, Chisinau, Moldova

Objective: Osteoporosis (OP) is the frequent complication of ankylosing spondylitis (AS). It has been shown that patients with AS in the early stages of the disease experience a significant decrease in bone mass, but the prevalence of OP, as well as the mechanism of its development in AS, are poorly studied. We evaluated BMD according to the degree of activity, form, radiological stage and duration of ankylosing spondylitis.
Methods: 72 patients with AS from the rheumatology department of the republican hospital (Chişinau) were examined (66 men and 6 women) aged between 20–60 y; men under 48 y predominated (80%), the average age was 42.2 ± 8.9 y. Diagnostic verification was performed according to the ASAS criteria.
Results: AS patients with low BMD were significantly older, had longer disease duration, and more severe functional impairment—the BASFI score being higher than in patients with normal bone density (5.5 ± 1.1 vs. 4,2 ± 0.6, $p < 0.01$) and a high degree of SA activity, which was manifested by significantly higher ASDAS-CRP indices, (3.9 ± 0.7 vs. 3.2 ± 0.9, $p < 0.01$), BASDAI (5.0 ± 0.9 vs. 3.6 ± 0.4, $p < 0.01$) and a large number of inflamed joints (IJ), mainly hip, knee and shoulder (3.4 ± 3.1 vs. 1.8 ± 1.9, $p = 0.012$). Patients with low BMD had significantly more pronounced radiographic changes in the spine than those with normal BMD.
Conclusion: More than half (57%) of patients with AS presented a decrease in BMD: 20% met the criteria for osteoporosis, 37% for osteopenia. The reason for osteoporosis in patients with AS is considered to be the high activity of the disease, as well as the disturbance of metabolism by increasing bone resorption and decreasing bone formation.

P752
EXPERIENCE OF NHS LOWER LIMB JOINT ARTHROPLASTY AMONG PARTICIPANTS IN THE HERTFORDSHIRE COHORT STUDY

L. D. Westbury[1], F. Kirkham-Wilson[1], C. Pearse[1], N. R. Fuggle[1], E. Zaballa[1], F. Laskou[1], G. Bevilacqua[1], K. A. Ward[1], C. Cooper[1], E. M. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK

Objective: Joint arthroplasty is a commonly performed elective surgery for severe osteoarthritis (OA), recommended for conditions that cannot be managed conservatively. The Hertfordshire Cohort Study, a cohort of community-dwelling older adults (n = 2997) was established in 1998; participants were then followed up for around 20 y. Here we report prevalence and correlates of NHS-funded lower limb joint arthroplasty.
Methods: Participants completed baseline questionnaires which detailed difficulties walking and use of aids. Of the initial cohort, 987 underwent baseline knee radiographs, which were graded according to Kellgren & Lawrence (K&L). DXA of the hip was contextually performed for 992 participants during the same visit. Participants were followed up from baseline (1998–2004) until December 2018 using Hospital Episode Statistics, reporting clinical outcomes using ICD-10 and OPCS-4 coding. Baseline characteristics in relation to risk of joint arthroplasty during follow-up were examined using sex-adjusted logistic regression.
Results: Mean (SD) age at baseline was 66.2 (2.8) y. Prevalence of radiographic OA (K&L ≥ 2) at baseline was 42% and 38% among men and women respectively. 14% of men and 18% of women had a lower limb joint arthroplasty (hip or knee) during follow-up; 8% of men and 10% of women underwent knee arthroplasty. Compared to their counterparts with no reported difficulties walking at baseline, those experiencing difficulties (reported problems, used walking aids, required help from others or were unable to walk) were more likely to undergo a knee arthroplasty over follow-up (odds ratio (95%CI): 3.33(2.54,4.37), $p < 0.001$); effect size was lower for hip arthroplasty (1.73(1.27,2.36)). Likewise, there was a graded association between baseline K&L score and lower limb arthroplasty (2.01(1.64,2.47) per unit increase in score, $p < 0.001$). As reported elsewhere, we observed positive relationships between femoral neck BMD t-score and knee arthroplasty (1.30(1.07,1.58) per unit increase, $p < 0.01$).
Conclusion: Our results highlight the high prevalence of joint arthroplasty in an unselected UK population and likely represent an underestimate, as we excluded privately funded joint arthroplasty. Given the personal and financial burden of joint arthroplasty surgery, our data highlight the value of interventions that target modifiable

factors which might slow OA progression and reduce this need in future generations.

P753
SOCIOECONOMIC POSITION, HEALTH BEHAVIOURS AND INCIDENT FRACTURE RISK: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY

L. D. Westbury[1], G. Bevilacqua[1], C. Cooper[1], E. M. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK

Objective: Several studies have highlighted a link between socioeconomic position and fracture, but relevant lifestyle information that is available is typically restricted to smoking, alcohol and physical activity. We examined relationships between socioeconomic position and health behaviours that included dietary behaviour, and examined socioeconomic position in relation to incident fracture risk among participants of the UK Hertfordshire Cohort Study, a community-dwelling cohort of older adults.
Methods: Data from 2997 individuals, aged 59–73 y at baseline (1998–2004), were analysed. Clinician-administered questionnaires were used to ascertain the following characteristics: age at leaving full-time education, occupational social class, housing tenure, smoking status, alcohol consumption, diet quality, and physical activity. Incident fractures were identified using ICD-10 codes from Hospital Episode Statistics data, available from baseline until December 2018. Markers of socioeconomic position in relation to health behaviours were examined using linear and logistic regression; socioeconomic markers in relation to fracture risk were examined using time-to-first event Cox regression. Analyses were adjusted for age and stratified by sex; $p < 0.05$ was regarded as statistically significant.
Results: Overall, 9% of men and 22% of women had a fracture during follow-up. Leaving education before age 15 was related to poorer diet quality; manual social class was related to current smoking, reduced likelihood of high alcohol consumption (women only) and poorer diet quality; and not owning one's home was related to current smoking, poorer diet quality and lower physical activity. Among women, not owning one's home was related to increased risk of incident fracture (hazard ratio (95%CI): 1.33 (1.03, 1.72), $p = 0.028$); this association was similar but slightly weaker among men (1.41 (0.96, 2.07), $p = 0.079$).
Conclusion: Associations between socioeconomic position and health behaviours were similar among men and women. Our findings were in accord with previous studies but extended these by including diet quality, an important health behaviour and established risk factor for fracture.

P754
ANXIETY AND DEPRESSION ARE ASSOCIATED WITH POOR HEALTH BEHAVIOURS AND INCIDENT FRACTURE AMONG WOMEN: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY

L. D. Westbury[1], G. Bevilacqua[1], C. Cooper[1], E. M. Dennison[1]

[1]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK

Objective: A recent systematic review has highlighted possible links between depression and fracture risk, but no information regarding possible explanatory health behaviours was available. In this study we used a well phenotyped community-dwelling cohort of older adults (the Hertfordshire Cohort Study) to consider these associations further.
Methods: Data from 2997 men and women, aged 59–73 y at baseline, were analysed. At baseline, mental health characteristics and health behaviours were ascertained through clinician-administered questionnaires. Anxiety and depression (mild or worse) were identified by scores of > 7 on the corresponding Hospital Anxiety and Depression Scale. Health behaviours included current smoking, alcohol consumption, diet quality and physical activity (Dallosso questionnaire). Incident fractures were identified using ICD-10 codes from Hospital Episode Statistics data, available from baseline (1998–2004) until December 2018. Health behaviours in relation to anxiety and depression were examined using logistic regression; anxiety and depression in relation to incident fracture were examined using Cox regression. All analyses were sex-stratified and adjusted for age; $p < 0.05$ was regarded as statistically significant.
Results: Prevalence of anxiety was 15% among men and 25% among women; prevalence of depression was 5% among men and 6% among women. Overall, 9% of men and 22% of women had a fracture during follow-up. Among men and women, poorer diet quality and lower physical activity were associated with depression; these health behaviours were also associated with anxiety among men. Current smoking was associated with anxiety and depression among women. Among women, anxiety (hazard ratio (95%CI): 1.34 (1.05, 1.72), $p = 0.019$) and depression (1.76 (1.18, 2.64), $p = 0.006$) were related to increased risk of incident fracture; among men, associations for anxiety ($p = 0.198$) and depression ($p = 0.265$) in relation to fracture were weaker.
Conclusion: Anxiety and depression were associated with increased risk of incident fracture among women, possibly due to their association with poor health behaviours, which are established risk factors for fracture. Preventive strategies are required to address poor health behaviours and mental health among older adults.

P755
A COMPREHENSIVE ANALYSIS CONCERNING THE IMPACT OF MUSCLE STRENGTH AND BONE QUALITY ON OSTEOPOROTIC FRACTURES IN ELDERLY WOMEN

L. Donggyu[1], L. Eun Chae[1]

[1]Yeungnam Univ. College of Medicine, Daegu, South Korea

Osteoporotic fractures are deeply correlated with both quality of life and mortality in elderly patients. Generally, the BMD is measured using DXA, which then guides the treatment of osteoporosis. However, spinal DXA measurements may be influenced by degenerative changes and calcification in tissues surrounding the spine, which can limit the accuracy of spinal BMD assessments. Therefore, TBS is employed to analyze bone quality, serving as an auxiliary marker to evaluate the likelihood of bone fractures in conjunction with BMD. Additionally, sarcopenia has been identified as a significant factor in osteoporotic fractures. This study aims to analyze factors affecting fractures in elderly patients by comprehensively examining both bony markers, such as spinal BMD and TBS, and muscular markers. We measured BMD, grip strength, and lean mass in female patients over the age of 65. Those who had undergone spinal fusion surgery, bilateral total hip replacement operations, or had been treated with osteoporosis drugs within the past year were excluded. Osteoporosis and lean mass measurements were conducted using DXA. We recruited a total of 52 female patients over the age of 65 (mean age 78.2 ± 5.4), 17 of whom had osteoporotic compression fractures. To investigate factors influencing fractures, a logistic regression analysis was performed considering age, spinal TBS, spinal BMD, grip strength, lean mass index, back muscle index, and grip strength

factors. The analysis revealed that only grip strength (P = 0.02) had a statistically significant impact on fractures. While BMD is known to affect osteoporotic compression fractures in studies involving all age groups, our analysis indicates that muscle strength shows a higher statistical correlation with fractures in elderly patients than BMD. Hence, evaluating and treating muscular entities is crucial in preventing osteoporotic fractures in this demographic.

P756
PERIOPERATIVE OPIOID USE AND DOSAGE TRAJECTORIES FOR GOOD VERSUS POOR PAIN OUTCOME CLASSIFICATION OF KNEE ARTHROPLASTY PATIENTS: RESULTS FROM A SECONDARY ANALYSIS OF A RANDOMIZED TRIAL

L. Dumenci[1], D. Riddle[2]

[1]Temple Univ., Philadelphia, [2]Virginia Commonwealth Univ., Richmond, USA

Objective: We determined if opioid use and dosage following knee arthroplasty (KA) varied for persons with externally validated good vs. poor pain outcome. A secondary purpose determined if bodily pain scores associated with KA outcome.
Methods: This was a secondary analysis of a prospective no-effect randomized clinical trial conducted on 384 participants scheduled for KA. Data were collected preoperatively and at 2-, 6- and 12-months following surgery. Two-piece latent class growth curve analyses applied previously validated pain outcomes to determine good vs. poor subgroup outcome trajectories for proportion of opioid users and oral morphine equivalent (OME) dosages.
Results: Substantial trajectory separation was found for opioid use and OME. Specifically, average OME dosage for the poor outcome subgroup was more than double that for the good outcome subgroup. Average preoperative opioid daily OME dosage for 170 patients reporting opioid use was 24.94 (95%CI = 20.52, 29.38). Bodily pain was consistently higher for the poor outcome subgroup compared to the good outcome subgroup.
Conclusion: Good vs. poor pain outcome subgroups in patients with pain catastrophizing demonstrated substantial differences in opioid use and dosage and were predicted by baseline body pain and changes in bodily pain over time. The poor outcome subgroup is at greater risk of opioid use and greater opioid dosages and should be targeted for preoperative interventions to reduce opioid use and potential consequences of opioid misuse.
Disclosures:
The study was supported by a grant (UM1AR062800) from the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) of the National Institutes of Health (NIH). Support was also provided by an NIH CTSA grant (UL1TR000058) from the National Center for Advancing Translational Sciences to Virginia Commonwealth University. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

P757
RADIOFREQUENCY ECHOGRAPHIC MULTISPECTROMETRY (REMS) FOR THE ASSESSMENT OF BMD REDUCTION AFTER PROSTHETIC SURGERY: A CLINICAL CASE REPORT

L. Farinelli[1], F. A. Lombardi[2], P. Pisani[2], F. Conversano[2], E. Casciaro[2], C. Stomaci[3], A. P. Gigante[4], S. Casciaro[2]

[1]Clinical Orthopedics, Dept. of Clinical and Molecular Science, School of Medicine, Università Politecnica Delle Marche, Ancona, [2]Institute of Clinical Physiology, National Research Council, Lecce, [3]Dept. of Biological and environmental sciences and technologies, Univ. of Salento, Lecce, [4]Clinical Orthopedics, Dept. of Clinical and Molecular Science, School of Medicine, Università Politecnica Delle Marche, Ancona, Italy

Knee and hip arthroplasty represent common procedure in orthopaedics. However, the interaction between bone and implant need to be analysed. It has been well established that the bone around implant might be face to a decreased BMD mainly due to mechanical stress (i.e., stress shielding) of altered joint biomechanics and/or aseptic inflammatory reaction leading to periprosthetic bone resorption. For these reasons, monitoring the bone around an implant is mandatory to guarantee longevity of implant and rule out cause of pain. In recent years, the non-ionising REMS technology, through the analysis of the reference axial sites (lumbar spine and femoral neck), has been used to assess the bone health status and fracture risk prediction. However, REMS is able to analyse the bone health status even in the presence of prosthetic implants due to its capability to automatically discard artefacts. We report a clinical case of patient underwent to hip arthroplasty with the analysis of bilateral bone femoral neck through REMS technology.
Case report: A 79-year-old Caucasian man underwent to left hip arthroplasty due to osteoarthritis. Bilateral bone femoral neck was analysed through REMS technology three months after surgery. As expected, differences between the two hips have been detected: the left femoral neck (with hip arthroplasty) was characterized by osteopenia with T-score = -1.6 and BMD = 0.715 g/cm^2, while the contralateral femoral neck showed a normal bone with T-score = -1.0 and BMD = 0.794 g/cm^2. The difference in BMD values between the two femurs could be due to the presence of low systemic BMD before surgery and/or adaptative bone remodelling, and these variations seem to be solely attributable to the prosthesis design and at the location of the femoral stem's fixation on the bone.
Conclusion: This clinical case confirms the BMD reduction after prosthetic implant and consequently the importance of a timely assessment of bone health status before and after implantation. Moreover, the study demonstrates that REMS technology, is an adequate technology for the assessment of the bone health status and for improving the management of osteoporosis also in this category of patients thanks to the automatic exclusion of artefacts. For this reason, REMS represents an important step forward in the bone health status assessment.

P758
IL-17/IL-23 AXIS-RELATED CYTOKINES AND CARDIOVASCULAR RISK IN SPONDYLOARTHRITIS: A POSSIBLE LINK?

L. Kharrat[1], M. Dhifallah[1], A. Tezeghdenti[2], R. Dhahri[1], E. Ghazouani[2], M. Slouma[1], I. Gharsallah[1]

[1]Rheumatology Dept., Military Hospital of Tunis, [2]Immunology Dept., Military Hospital of Tunis, Tunis, Tunisia

Objective: Due to inflammatory cascade, patients with spondyloarthritis (SA) are exposed to a higher risk of cardiovascular (CV) events increasing their morbidity and mortality. We aimed to study the relationship between IL-17/IL-23 axis-related cytokines and CV risk factors in SA patients.
Methods: We conducted a cross-sectional study including 45 SA patients meeting the ASAS criteria. For each patient we collected the following data: age, disease activity (using BASDAI and $ASDAS_{CRP}$ scores), and CV risk factors. We also measured the following parameters: total cholesterol (TC), Low-density lipoprotein cholesterol (LDL-c), high-density lipoprotein cholesterol (HDL-c), triglycerides, and IL-17/IL-23 axis-related cytokines serum levels (IL-17, IL-23, and IL-6) as well as IL-1 level. We calculated the CV risk using the Systematic Coronary Risk Evaluation (SCORE) based on the following parameters: smoking, systolic blood pressure, and CT level. This score categorizes patients into low (SCORE risk < 1%), moderate (SCORE risk 1–4%), high (SCORE risk 5–9%), or very high (SCORE risk > 10%) 10-y risk of total CV disease mortality.
Results: We included 37 men and 8 women. The mean age was 46.1 ± 11.8 y. The mean disease duration was 9.43 ± 8.27 y. The mean BASDAI and $ASDAS_{CRP}$ were 3.69 ± 2.02 and 2.75 ± 1.23, respectively. 53% of the patients were smokers (n = 24) with a mean pack-year of 16. Comorbidities were noted in 6 patients: diabetes (n = 4), hypertension (n = 5), and dyslipidemia (n = 1). The mean BMI was 25.7 ± 5.1 kg/m^2. Almost half of the patients were overweight or obese (51.1%). The mean systolic blood pressure was 124.9 ± 12.5 mmHg. The mean levels of CT, LDL-c, HDL-c, and triglycerides were 4.6 ± 0.9, 2.9 ± 0.8, 1.1 ± 0.3, and 1,3 ± 0.5 mmol/L, respectively. The mean SCORE was 0.8%. Patients were classified as follows: 27 (60%) at low risk, 16 (35.5%) at moderate riskand 2 (4.4%) at high risk. The mean IL-1, IL-6, IL-17, and IL-23 levels were 10.9 ± 23.1, 13.9 ± 42.4, 91.8 ± 80.5, and 17.3 ± 16.9 pg/mL, respectively. IL-1 level was associated with smoking (15.27 ± 31.2 vs. 5.86 ± 2.45 pg/mL, p = 0.005). There was a negative correlation between IL-1 level and HDL-c level (r = -0.300, p = 0.045). Furthermore, patients with hypercholesterolemia had significantly higher IL-17/IL-6 ratio (47.72 vs. 18.79, p = 0.025). Moreover, IL-17 level was correlated to SCORE score (r = 0.375, p = 0.011). Patients with a SCORE > 1% have higher IL-17 (133.8 ± 110.3 vs. 63.7 ± 31.1 pg/mL, p = 0.017), IL-17/IL-1 (23.7 vs. 9.7, p = 0.041), and IL-17/IL-6 ratios (47.5 vs. 20, p = 0.015).
Conclusion: Our study showed that IL-17 level was associated with moderate to high risk of CV events over 10 y. Recently, Wang et al. showed that IL-17 level can predict the occurrence of coronary artery disease [1]. The measurement of IL-17 levels, IL-17/IL-1 ratio, and IL-17/IL-6 ratio seem to be useful in assessing CV risk in patients with SA.
Reference: (1) Wang C, et al. Clin Cardiol 2023;47:e24188.

P759
DOES THE PRESENCE OF ANTI-NUCLEAR ANTIBODY IMPACT THE THERAPEUTIC RESPONSE TO BIOLOGICS IN RHEUMATOID ARTHRITIS?

W. Triki[1], L. Kharrat[1], H. Ferjani[1], F. Majdoub[1], D. Ben Nessib[1], D. Kaffel[1], K. Maatallah[1], W. Hamdi[1]

[1]Rheumatology Dept., M.T Kassab of Orthopedics Institute, Ksar Saïd, Tunisia

Objective: Rheumatoid arthritis (RA) is an autoimmune disease that could be associated to antinuclear antibody (ANA) positivity [1]. The involvement of ANAs in the therapeutic response to biologics in this disease is not well studied. We aimed to study the link between ANA positivity and the therapeutic response to biological agents in RA.
Methods: We conducted a retrospective study including 93 patients followed for RA meeting the ACR/EULAR 2010 criteria. For each patient we collected the following parameters: age, gender, disease duration, tender joint count (TJC), swollen joint count (SJC), disease activity using the Disease Activity Score (DAS28), and the biological or targeted therapies received by the patients (anti-TNFα, tocilizumab, rituximab, and anti-JAK). Erythrocyte sedimentation rate (ESR), c-reactive protein (CRP) and ANAs levels were also noted.
Results: There were 83 women and 14 men. The mean age was 58.31 ± 12.19 y. The mean disease duration was 11.58 ± 8.63 y. The mean TJC and SJC were 7.69 ± 6.56 and 4.42 ± 4.72; respectively. The mean ESR and CRP levels were 41.35 ± 29.93 mm and 17.25 ± 22.64 mg/L; respectively. Mean DAS28-ESR and DAS28-CRP were 4.84 ± 1.54 and 4.35 ± 1.47; respectively. 32% of patients had positive ANAs (n = 31) with a mean titer of 1/726.52 [180/-1/3200]. Erosive RA was noted in 84% (n = 82) of cases. 43 patients were under biological agents (46%) including 13 patients with positive ANA. 27 patients were under an anti-TNFα (63%), 7 under an anti-IL6 (16%), 6 under an anti-CD20 (14%) and 3 under an anti-JAK (7%). A therapeutic switch was indicated in 13 patients (60%): 5 times for primary failure, 4 times for secondary failure, and 4 times after occurrence of adverse effects. ANA level was positively correlated with the following parameters: TJC (r = 0.910; p < 10–3), SJC (r = 0.769; p = 0.009), DAS28-ESR (r = 0.698; p = 0.037) and DAS28-CRP (r = 672; p = 0.047). Similarly, ANA level was significantly higher in case of primary failure to a biotherapy (1/1200 ± 565.68 vs. 1/322.5 ± 222.3; p = 0.044).Nevertheless, the presence of ANA was not associated with erosive RA.
Conclusion: ANA level was correlated to disease activity. Moreover, ANA level was significantly higher in case of primary failure to biological agents. These results suggest that a special attention should be paid to patients with positive ANAs and under biological or targeted agents.
Reference: (1) Zhang JF, et al. Beijing Da Xue Bao Yi Xue Ban 2020;52:1023.

P760
FACTORS ASSOCIATED WITH LOW BONE MINERAL DENSITY IN JUVENILE IDIOPATHIC ARTHRITIS

W. Lahmar[1], L. Kharrat[1], S. Bouzid[1], H. Ferjani[1], D. Ben Nessib[1], F. Majdoub[1], D. Kaffel[1], K. Maatallah[1], W. Hamdi[1]

[1]Kassab's Institute of Orthopedics, Manouba, Tunisia

Objective: Children with juvenile idiopathic arthritis (JIA) are at higher risk of decreased BMD compared with healthy children due to genetic, inflammatory disease and medication-related causes. We

aimed to evaluate the BMD in children with JIA and the potential associations of a low bone density.
Methods: We conducted a retrospective study involving JIA patients diagnosed according to ILAR 2010 diagnosis criteria. For each patient we collected the following data: JIA subtype, age, age at the onset of the disease, disease duration, diagnosis delay, BMI, the presence of uveitis, the presence of structural damage on imagery and therapeutic management. Disease activity was assessed using the juvenile arthritis disease activity score 10 using normalized ESR (JADAS-10-ESR) for all JIA subtypes and the Juvenile Spondyloarthritis Disease Activity Index (JSpDA) for related-enthesitis arthritis (ERA) and psoriatic arthritis subtypes. Baseline BMD using a DXA of the entire body was extracted and expressed in g/cm ^{2}. A low bone density was defined as Z-score $<$ -1 [1].Patients were divided into 2 groups: G1 with Z-score $<$ -1 and G2: Z-score $>$ -1.
Results: In total 72 patients were included, comprising 37 boys and 34 girls, with a mean age of 13.73 $\pm$ 5.06 y. The mean age at the onset of the disease, the mean disease duration and diagnosis delay were 9.19 $\pm$ 4 y, 4.34 $\pm$ 3.6 y and 7.07 $\pm$ 8.53 months, respectively. The observed JIA subtypes were as follows: systemic JIA in 4 (6%) patients, oligoarthritis form in 15 (21%), polyarthritis with positive rheumatoid factor in 3 (4%), polyarthritis with negative rheumatoid factor in 5 (7%), ERA in 33 (46%) patients, psoriatic arthritis in 8 (11%) patients, and undifferentiated juvenile arthritis in 4 (6%). The mean BMD was 0.907 $\pm$ 0.11 [0.656–1.136], with a mean Z-score of -0.785 [-2.6 – 1.4]. Mean BMI was 20.02 $\pm$ 4.8 [13.75–31.20]. The mean JADAS-10-ESR and JSpDA were 9.1 $\pm$ 5.4 and 2.8 $\pm$ 1.6, respectively. Uveitis was noted in 5 patients (7%), while radiographic sacroiliitis was noted in 16 patients (22%). 17 patients had low bone density, which was associated with the presence of radiographic sacroiliitis (11 vs. 89%, p = 0.008) and conventional synthetic disease-modifying antirheumatic drugs (csDMARDs) intake (16 (66%) vs. 1(10%), p = 0.007). Mean BMD was lower in patients with juvenile spondylarthritis (ERA form and psoriasis arthritis) (0.932 vs. 0.831, p = 0.045). Mean Z-score was lower in patients with radiographic sacroiliitis. (-0.331vs -1.58, p = 0.004). Z-score correlated negatively with disease duration (r = -0.354, p = 0.037), diagnostic delay (r = -0.356, p = 0.042), and hospitalization duration (r = -0.601,p = 0.008). There was a positive correlation between Z-score and BMI (r = 0.428, p = 0.016). However, it did not show a correlation with disease activity.
Conclusion: JIA patients may be at risk of decreased BMD. The study identifies factors like the presence of sacroiliitis, longer duration of hospitalization, and csDMARDs intake which are a surrogate for a severe disease. Moreover, the juvenile spondylarthritis form was a contributor factor to low bone density. Early detection and intervention are mandatory to managing bone health in this vulnerable population.
Reference: (1) Writing Group for the ISCD Position Development Conference. J Clin Densitom 2004;7:17.

P761
EFFICACY OF TREATMENT WITH DENOSUMAB IN OSTEOPOROTIC GEORGIAN MALE POPULATION: NATIONAL OSTEOPOROSIS ASSOCIATION OF GEORGIA

L. K. Kilasonia[1], N. D. Dolidze[2], T. R. Rukhadze[1], M. T. Tsagareli[3], L. L. Lagvilava[4], G. A. Aladashvili[1]

[1]"Tbilisi Heart and Vascular Clinic" Ltd, [2]"MediClubGeorgia" Ltd, [3]National Institute of Endocrinology, [4]"Conslium Medulla " Ltd, Tbilisi, Georgia

Objective: Male osteoporosis cases worldwide are increasing in number, statistics of male OP have its explanatory basis. Every 3rd 50 year old or older males worldwide are suffering from femur fractures. WHO have stated that male osteoporosis cases will increase from 200 to 300 million in males at age 60 years or older, referring to phenomenon of "demographic Hurricane". Male population is less informed to have osteoporosis, therefore, prophylaxis and visits to diagnose and prevent the disease is much less, in comparison to female patients. We have decided to assess efficacy of denosumab in Georgian males.
Methods: Research involved 250 male patients in two age categories: 33–55 and 60–80. Receiving denosumab 60 mg SC 1 in every 6 months for 3 y. BMD (T-score) was measured by Lunar Prodigy.
Results: Mean BMD is less in young subgroup than in older subgroup patients. Denosumab 60 mg SC treatment showed better results in young males than in older counterparts. No side effects were observed or spotted during treatment period. Denosumab use in males diagnosed with OP, have been characterized as safe and effective.

Indications	Group 1 (age 33-55) n-92	Group 2 (age 60-80) n-100
Baseline	-3.1 +0.015	-2.9 +0.015
Post treatment	-2.6 +0.16	-2.9 +0.15
	P<0.01	P<0.05

P762
ASSESSING THE IMPACT OF HOSPITAL TRANSFER ON TIMELY SURGICAL MANAGEMENT AND POSTOPERATIVE OUTCOMES FOR HIP FRACTURE PATIENTS IN SCOTLAND: A COHORT STUDY

L. L. Lennox[1], L. F. Farrow[1], P. M. Myint[1], S. B. Baliga[2]

[1]Univ. of Aberdeen, [2]NHS Grampian, Aberdeen, UK

Objective: To determine whether indirect hospital admission via hospital transfer affects the likelihood of surgical management within 36 h for hip fracture patients. Secondary aims explored associations between transfer status and other outcomes based on the Scottish Standards of Care for Hip Fracture Patients guidelines.
Methods: A retrospective cohort study using Scottish Hip Fracture Audit data enrolled patients aged $\geq$ 50 with hip fractures between January 2019 and December 2021 in Scotland. Patients were dichotomised into two groups based on their transfer status and matched. Descriptive analysis compared patient characteristics. Regression assessed patient outcomes in the unmatched and matched cohorts. To explore the potential effects of unmeasured confounders relating to patient frailty, we performed a sensitivity analysis which replicated the main analysis but for patients aged $\geq$ 80 who were not admitted from home.
Results: The unmatched analysis included 20,190 patients, with 19,049 (94.3%) in the non-transfer group and 1141 (5.7%) in the transfer group. Transfer patients were younger (p = 0.007), more frequently admitted from home (p $<$ 0.001) and had better baseline health (p $<$ 0.001). In the matched population, 711 (63.6%) transfer patients had timely surgery, compared to 852 (75.3%) non-transfer patients. Transfer patients had 43% reduced odds of timely surgery (OR (95%CI) 0.57 (0.48 to 0.69); p $<$ 0.001); waited longer for surgery (medium (IQR) 30.1 (18.2 to 41.1) vs. 20.3 (14.5 to 35.9); p $<$ 0.001); and experienced three additional days in hospital (median (IQR) 16 (8 to 33) vs. 13 (8 to 30); p = 0.024). No significant disparities emerged between the two groups for 30-d mortality, 60-d mortality, postoperative mobilisation, and returning to residence postoperatively.
Conclusion: Hospital transfer is significantly associated with reduced odds of achieving surgical management for hip fractures within 36 h of admission, a longer time to surgery, and a greater length of stay in Scotland. Despite this, transfer patients did not experience worse postoperative outcomes. It is unclear if this is the result of residual confounding effects. Future research is required to address the limitations of this study to determine if hospital transfer is associated with worse postoperative outcomes in Scotland.

P764
SOCIETAL COSTS BEFORE AND UP TO ONE-YEAR AFTER THE FIRST FRACTURE LIAISON SERVICE VISIT IN PATIENTS REQUIRING ANTI-OSTEOPOROSIS TREATMENTS

L. Maas[1], A. Boonen[2], C. E. Wyers[3], S. Bours[4], J. van den Bergh[5], S. M. J. van Kuijk[6], S. Evers[7], M. Hiligsmann[1]

[1]Dept. of Health Services research, Care and Public Health Research Institute (CAPHRI), Maastricht Univ., Maastricht, [2]Dept. of Health Services Research, Care and Public Health Research Institute (CAPHRI), Maastricht Univ.; Dept. of Internal Medicine, Division of Rheumatology, Maastricht Univ. Medical Center, Maastricht, [3]Dept. of Internal Medicine, VieCuri Medical Center; Dept. of Internal Medicine, NUTRIM, Maastricht Univ. Medical Center, Maastricht and Venlo, [4]Dept. of Internal Medicine, Division of Rheumatology, Maastricht Univ. Medical Center, Maastricht, [5]Dept. of Internal Medicine, VieCuri Medical Center; Dept. of Internal Medicine, Division of Rheumatology, Maastricht Univ. Medical Center, Venlo and Maastricht, [6]Dept. of Clinical Epidemiology and Medical Technology Assessment, Maastricht Univ. Medical Center, Maastricht, [7]Dept. of Health Services Research, Care and Public Health Research Institute (CAPHRI); Center of Economic Evaluation & Machine Learning, Trimbos Institute, Netherlands Institute of Mental Health and Addiction, Maastricht and Utrecht, Netherlands

Objective: Limited literature is available on resource utilization and societal costs of patients visiting fracture liaison services (FLS). This study aimed to estimate the societal costs incurred by patients with a recent fracture requiring anti-osteoporosis medication before and one-year after the first FLS visit and to explore differences according to fracture type.
Methods: Resource utilization was collected through a self-reported questionnaire with a 4-month recall on health resource utilization and productivity losses immediately following the first FLS visit, and 4 and 12 month later. Unit costs derived from the national Dutch guideline for economic evaluations were used to compute societal and healthcare costs. Linear mixed-effects models, adjusted for confounders, were used to analyze societal and healthcare costs over time as well as effect of fracture type on societal and healthcare costs.
Results: A total of 126 patients from two Dutch FLS centers were included, of whom 41 sustained a major fracture (hip, vertebral, humerus, or radius). Societal costs in the 4 months prior to the first visit (€2911) were significantly higher compared to societal costs four months (€711, p-value = 0.009) and twelve months later (€581, p-value p = 0.001). Fracture type did not have a significant effect on total societal or healthcare costs. All costs 12 months after the initial visit were lower for major fractures compared to others.
Conclusion: Societal and healthcare costs in the year following the first FLS visit significantly decreased compared to those costs before the first visit and were independent of fracture type.
Acknowledgement: This study was funded by the ZonMw research line Rational Pharmacotherapy, grant number 848016001.

P765
EFFECT OF COMBINING A PATIENT DECISION AID WITH MOTIVATIONAL INTERVIEWING ON ADHERENCE AND QUALITY OF SHARED DECISION MAKING AMONG PATIENTS WITH A RECENT FRACTURE ATTENDING A FRACTURE LIAISON SERVICE AND REQUIRING ANTI-OSTEOPOROSIS TREATMENT

L. MAAS[1], M. Hiligsmann[1], C. E. Wyers[2], S. Bours[3], T. van der Weijden[4], J. van den Bergh[5], M. van Oostwaard[2], S. M. J. van Kuijk[6], A. Boonen[7]

[1]Dept. of Health Services research, Care and Public Health Research Institute (CAPHRI), Maastricht Univ., Maastricht, [2]Dept. of Internal Medicine, VieCuri Medical Center; Dept. of Internal Medicine, NUTRIM, Maastricht Univ. Medical Center, Venlo and Maastricht, [3]Dept. of Internal Medicine, Division of Rheumatology, Maastricht Univ. Medical Center, Maastricht, [4]Dept. of Family Medicine, Care and Public Health Research Institute (CAPHRI), Maastricht Univ., Maastricht, [5]Dept. of Internal Medicine, VieCuri Medical Center; Dept. of Internal Medicine, Division of Rheumatology, Maastricht Univ. Medical Center, Venlo and Maastricht, [6]Dept. of Clinical Epidemiology and Medical Technology Assessment, Maastricht Univ. Medical Center, Maastricht, [7]Dept. of Health Services research, Care and Public Health Research Institute (CAPHRI), Maastricht Univ.; Dept. of Internal Medicine, Division of Rheumatology, Maastricht Univ. Medical Center, Maastricht, Netherlands

Objective: Shared decision making (SDM) aims to improve patients' experiences with care and treatment adherence. However, the effectiveness of SDM in patients with a recent fracture who require anti-osteoporosis medication (AOM) is unclear. The objective of this study was to assess the effectiveness of a multi-component adherence intervention (MCAI), including SDM with a patient decision aid (PDA) and motivational interviewing at fracture liaison services (FLS) on multiple outcomes, compared to usual care (UC).
Methods: This one-year pre-post superiority study included patients with a recent fracture attending FLS and requiring AOM. As primary outcome, AOM persistence (defined as a patient being in possession of AOM at 12 months, considering a refill gap of $\geq$ 4 weeks). Secondary outcomes were treatment initiation, AOM adherence (measured by medication possession rate, MPR), decision quality (SDM process (0–100; best) and decisional conflict (0–100, highest conflict), fractures, and mortality. Outcomes were tested in MCAI and UC groups at the first FLS visit and 4 and 12 months after. In addition to crude comparisons of outcomes between groups, logistic regression were used to adjust for baseline group differences. Post hoc analyses assessed the role of health literacy limitations.
Results: In total, 245 patients (MCAI: 136, UC: 109) were included (mean age: 71 y, female: 75%, health literacy limitations: 26%). AOM persistence in the MCAI group was 80.4% and 76.7% in UC (p = 0.626). AOM initiation (97.8 vs. 97.5%), MPR (90.9 vs. 88.3%), and decisional conflict (21.7 vs. 23.0) did not differ between groups. SDM process was significantly better in MCAI (60.4 vs. 55.1, p = 0.003). Results did not change after adjustment. Health literacy stratification showed a lower effect on MPR and SDM in those with health literacy limitations.
Conclusion: In FLS, MCAI has no significant effect on AOM adherence, but a significant positive effect on SDM process was found.

P766
FREQUENCY OF EXTRASKELETAL CALCIFICATION DEPENDING ON THE PTH LEVEL IN HEMODIALYSIS PATIENTS

L. Martynyuk[1], T. Malska[1], L. Martynyuk[1]

[1]Ternopil National Medical Univ., Ternopil, Ukraine

Objective: MBD-CKD which includes laboratory abnormalities, fractures and bone disorders as well as cardiovascular and intraskeletal calcification (EC) is associated with worse outcomes in CKD patients and leads to increased risk of morbidity and mortality of dialysis patients. The aim of this study was to study the prevalence of disorders of mineral metabolism to rule out factors which lead to EC in CKD dialysis patients on example of single dialysis centre.
Methods: We examined 157 adults (78 men and 79 women) CKD 5 stage on hemodialysis (mean age 48.2 ± 14.5 y) from a single dialysis centre. The laboratory investigations included evaluation of PTH, serum total and ionized calcium, serum phosphate, serum level of alkaline phosphatase concentrations. PTH level in serum was evaluated by solid phase chemiluminescent immunoassay. All patients had undergone Echocardiography examination and X-ray examination.
Results: Overall, 67 (42.7%) of patients had bicuspid, aortic valve or both valves calcification either peripheral artery calcification. Patients with EC had significantly more prominent disturbances in mineral metabolism compared to group of patients without calcification. Phosphorous concentration in group with EC showed (2.37 ± 0.09 vs. 1.97 + 0.05 mmol/l, $p < 0.01$) in group without EC. Calcium level was significantly higher in group with EC (2.32 + 0.05 vs. 2.19 + 0.02 mmol/l, $p < 0.05$). On the other hand it was not significant difference in PTH level (574.16 + 119.2 vs. 520.78 + 50.40 pg/l, $p > 0.05$). For further analysis patients were divided into groups according to KDIGO 2017 recommendations for PTH levels in order to establish the association between PTH levels and EC. In patients with low levels of PTH (less than 2 times less the lower limit) incidence of EC was significantly higher 22 (32.8% vs. group with target levels of PTH (more than 2 times more than lower limit and less than 6 times less the upper limit) – 10 (14.9%), $p < 0.05$). The same tendency was present in patients with high levels of PTH (more than 6 times over the upper limit): incidence of EC was significantly higher 35 (52.2%) compared with those with target PTH levels $p < 0.01$).
Conclusion: EC is present in 67 (42.7%) of hemodialysis patients and is associated with hypercalcemia and hyperphosphatemia. Both too low and too high levels of PTH contribute greatly in development of EC in dialysis patients compared to those with target PTH levels.

P767
INCIDENCE OF OSTEOARTHRITIS IN THE POPULATION OF EASTERN SIBERIA (RUSSIAN FEDERATION) FROM 1999–2022

L. Menshikova[1], E. Belikh[2], M. Menshikov[1]

[1]Irkutsk State Medical Academy of Postgraduate Education,
[2]Regional Clinical Diagnostic Center ("IOKKDC"), Irkutsk, Russia

Objective: Osteoarthritis is the most common joint disorder, causing pain and functional disability. We aimed to study the incidence of osteoarthritis (OA) in the population over 18 years of age in the Irkutsk region (Eastern Siberia, Russian Federation).
Methods: The analysis of the data of the official statistics of the Ministry of Health of the Irkutsk region and the Russian Federation on the morbidity of OA in the adult population (over 18 years old) for the period from 1999–2022 was carried out.
Results: The adult population of the Irkutsk region is more than 1,880,000 people. The total number of registered adult patients with OA in 1999 amounted to 1835.4 per 100 thousand, primary morbidity – 343.9 and was higher than in the Russian Federation—1263.1 and 350.8/100,000. In 2003, there was an increase in the incidence to 2385.6 and 450.8 per 100 thousand, an increase of 30.0% and 31.1%. In the Russian Federation, there is also an increase in the incidence of OA 1846.0 and 500.2/100,000 (an increase of 46.1% and 42.6%) respectively. In 2006, the incidence rates were higher than 3146.0 and 572.1/100,000 with an annual increase. In 2013, they amounted to 3959.6 and 738.0/100,000 and the growth compared to 2006 was 25.9% and 29.0%. In 2019 the highest incidence rates were noted – 4950.9 and 1570.9/100 thousand. In 2022, the morbidity decreased after COVID -19 and amounted to 4407.0 and 1066.4/100,000 of the population.
Conclusion: The general and primary incidence of OA in the adult population increased from 1999 to 2022. The increase in incidence by 2.4 and 3.1 times is due to both aging of the population and better diagnosis, including the early stage of OA using MRI (in the absence of radiological changes).

P768
FRACTURES OF THE HUMERUS IN PERSONS OVER 40 YEARS OF AGE IN EAST SIBERIA (RUSSIAN FEDERATION)

L. Menshikova[1], O. Dvoeglazova[2], M. Menshikov[1]

[1]Irkutsk State Medical Academy of Postgraduate Education, Irkutsk,
[2]MANO "Medical and Diagnostic Center", Angarsk, Russia

Objective: To study the frequency of the proximal humerus fractures in people over 40 y of age in the Irkutsk region (East Siberia, Russian Federation).
Methods: There were analyzed the medical documentations of trauma centers, trauma departments of Angarsk with a stable population, where the primary incidence was recorded. Only fractures received at a low level of injury were evaluated. A specially designed questionnaire was filled out with alphabetical verification of patients. The fracture rate was calculated based on 5-y strata and per 100,000 person-years of observation over 5 y.
Results: The average population over the age of 40 was 68.133 for women and 43.470 for men. In women, the incidence of proximal fractures ranged from 5.2/100 thousand person-years over the age of 40–49 y to 289.1/100 thousand person-years in the age group over 70 y, averaging 211.3/100 thousand person-years of follow-up. In men, the lowest incidence of humerus fractures was also found at the age of 45–49 y, 4.7/100 thousand person-years and the highest in the age group over 70 y—223.2/100 thousand person-years. The average rate of humerus fractures in men was 98.8/100 thousand. The number of man-years of follow-up was significantly lower than that of women.
Conclusion: In women, the incidence of proximal humerus fractures was higher than in men with the lowest fracture rates in the 40–49 age group and high in those over 70 y of age.

P769
PUTATIVE MEDIATORS OF DECREASED BONE MINERAL DENSITY IN HIV EXPLORED BY TARGETED PROTEOMICS

A. Mendham[1], J. Goedecke[2], I. Seipone[2], T. Olsson[3], L. Micklesfield[1]

[1]Univ. of the Witwatersrand, Johannesburg, South Africa, [2]South African Medical Research Council, Cape Town, South Africa, [3]Umea Univ., Umea, Sweden

Objective: Using a targeted proteomics approach, we aimed to explore possible mediators of lower bone mass among people living with HIV (PLWH).

Methods: This cross-sectional study includes the Middle-Aged Soweto Cohort (MASC) of Black South African men and women (n = 940; mean (SD) age: 54 (6) y) which included 185 PLWH and 755 HIV negative participants. Data was collected on age, current employment, smoking status, alcohol consumption, menopausal status, medication usage, and height and weight were measured to calculate BMI. DXA was used to measure whole body fat mass and BMD at the femoral neck, total hip, lumbar spine (L1-L4) and whole-body (minus the head). Fasting blood samples were drawn for the measurement of targeted proteomics (OLINK proximity extension assay technique). Differences in targeted proteomics between HIV groups were first explored. This highlighted target proteins to correlate with BMD and explore the mediating effects of HIV on these associations. All statistical phases adjusted for false discovery rate.
Results: Compared to HIV negative participants, PLWH were younger ($p < 0.001$) and had a lower BMI ($p < 0.001$). When adjusting for age, sex, and BMI, PLWH had a significantly lower whole-body ($p < 0.001$), lumbar spine ($p < 0.001$), femoral neck ($p = 0.001$) and total hip BMD ($p = 0.005$) compared to HIV negative participants. Of the 182 targeted proteins, 64 proteins were different between the HIV groups, of which 13 (20.3%) were associated with BMD at one or more sites. Notably, COL1A1, OPN, IGFBP2 and TIMP4 were higher in PLWH and associated with lower BMD at all sites. Using mediation analysis, we showed that these proteins partially mediated the effects of HIV on BMD (proportion of total effect mediated range: 10.4–18.9%; $p < 0.05$).
Conclusion: We have found novel protein markers that collectively represent pathways related to bone formation and resorption that may be altered in PLWH. These markers need to be explored to reveal possible mechanisms for the higher risk of osteoporosis and fractures in PLWH.

P770
COST-EFFECTIVENESS OF FRAX®-BASED INTERVENTION THRESHOLDS FOR MANAGEMENT OF OSTEOPOROSIS IN INDIAN WOMEN

L. Nagendra[1], M. Chandran[2], S. Bhattacharya[3], J.-Y. Reginster[4], M. Hiligsmann[1]

[1]Dept. of Health Economics and Health Technology Assessment, Maastricht Univ., Maastricht, Netherlands, [2]Osteoporosis and Bone Metabolism Unit, Dept. of Endocrinology. Singapore General Hospital, Singapore, Singapore, [3]Deaprtment of Endocrinology, Indraprastha Apollo Hospital, Delhi, India, [4]Dept. of Epidemiology, Public Health and Health Economics, Univ. of Liege, Liege, Belgium

Objective: FRAX-based intervention thresholds (ITs) were recently identified for osteoporosis management in India.(1) This study aimed to assess the cost-effectiveness of ITs in Indian women aged 50 y and over.
Methods: A validated Markov microsimulation model was adapted to estimate the lifetime healthcare costs (INR 2022) per quality adjusted life-years (QALY) of oral alendronate compared with no treatment. Cost-effectiveness of age-dependent FRAX major osteoporotic fracture (MOF)) ITs was estimated. In addition, cost-effectiveness of fixed thresholds of 10.5% for MOF, recommended by the Indian Society of Bone and Mineral Research (ISBMR) guidelines were assessed. Cost data was obtained from the National Health System Cost Database for India. Generic alendronate price and no long-term costs following fractures were used in base case. A cost-effectiveness threshold of INR 1,97,468 /QALY gained was used, based conservatively on one time the Indian GDP per capita.
Results: Alendronate was shown to be cost-effective at MOF ITs from the ages of 65 y under full and real-world adherence. Sensitivity analyses suggested that cost-effectiveness at MOF ITs and HF ITs was reached from the age of 60 years when including INR 10,000 monthly costs following hip fractures. When using a 10.5% IT for MOF, treatment was cost-effective from the age of 50 y assuming full adherence, and from the age of 60 y assuming real world adherence.
Conclusion: This study suggests that the treatment of Indian women with alendronate is cost-effective at age-dependant FRAX intervention thresholds at 65 y and older when assuming no long-term costs following hip fracture, and from 60 y or older when long-term costs following hip fractures were included. If fixed IT are used, cost-effectiveness could be reached from the age of 50 y in some scenarios. Offering cost-effective access to therapy for individuals with high fracture probabilities, as determined by FRAX, holds significant potential in mitigating the escalating burden of osteoporotic fractures in India.
Reference: (1) Nagendra L, et al. Arch Osteoporos 2021;16:69.

P771
PREVALENCE OF ASYMPTOMATIC VERTEBRAL FRACTURES ON VERTEBRAL FRACTURE ASSESSMENT USING DUAL ENERGY X-RAY ABSORPTIOMETRY IN PATIENTS VISITING AN INDIAN ACADEMIC TERTIARY CENTRE AND ITS IMPACT ON THE DIAGNOSIS OF OSTEOPOROSIS

L. Nagendra[1], N. Bhavani[2], P. Pavithran[2], U. Menon[2], N. Abraham[2], V. Nair[2], M. Hiligsmann[3], H. Kumar[2]

[1]Dept. of Endocrinology, JSS Medical College, JSS Academy of Higher Education and Research, Mysuru, India, [2]Dept. of Endocrinology, Amrita Institute of Medical Sciences and Research Centre, Kochi, India, [3]Dept. of Health Economics and Health Technology Assessment, Maastricht Univ., Maastricht, Netherlands

Objective: Vertebral fracture assessment (VFA) is gaining importance as a routine part of DXA assessment. However, data on prevalence of asymptomatic vertebral fractures in the Indian setting and its impact on diagnosis osteoporosis is scarce. This study aimed to look at the prevalence of vertebral fractures by VFA in patients referred for BMD assessment and to assess its impact on the diagnosis of osteoporosis.
Methods: 100 patients aged more than 40 y who were referred to an osteoporosis clinic for BMD testing were included in the study by simple random sampling. BMD of the lumbar spine L1-L4 and the proximal femur was measured by DXA. VFA was performed by vertebral morphometry immediately after DXA. Mild fractures were excluded.
Results: The study population consisted of 93 postmenopausal women and 7 males. The mean age was 67.58 ± 9.04 y. Among the study participants, 86 fractures were detected on VFA in 44 patients of which 30 (68.1%) were asymptomatic. There was no significant correlation of fracture incidence with BMD ($p = 0.252$). There were no fractures in participants aged less than 50 y. Prevalence of vertebral fractures increased with age from 11.1% in the 50–60 y age group to 75%% in > 80 y. Addition of VFA to BMD led to a.
diagnosis of osteoporosis in an additional 16 patients who went on to receive treatment for osteoporosis.

Conclusion: There is a high prevalence of asymptomatic vertebral fractures in the Indian population and including VFA with BMD measurement substantially improves the utility of DXA in the diagnosis of osteoporosis and fracture risk assessment.

P772
PERFORMANCE COMPARISON BETWEEN HOUNSFIELD UNITS AND DXA IN PREDICTING LUMBAR INTERBODY CAGE SUBSIDENCE AFTER CIRCUMFERENTIAL LUMBAR FUSION

K. Schuler[1], L. Orosz[1], T. Yamout[2], B. Allen[1], W. Lerebo[1], R. Roy[1], T. Schuler[2], C. Good[2], C. Haines[2], J. Ehsan[2]

[1]National Spine Health Foundation, [2]Virginia Spine Institute, Reston, USA

Objective: BMD assessment is essential for spinal fusion surgical planning, but gold standard DXA is affected by degeneration often resulting in falsely elevated scores. Studies on opportunistic measurement of computed tomography Hounsfield units (CTHU) suggest lower values predict interbody cage subsidence, yet cutoff values vary and lack standardization. This study aims to determine if cutoff value CTHU < 135 is associated with lumbar interbody cage subsidence and to compare the predictive performance of subsidence between CTHU and DXA.
Methods: Circumferential lumbar fusions were retrospectively enrolled if DXA, CT, and x-rays were available, and minimum follow up was one year. Interbody fusions were analyzed for subsidence ≥ 2 mm by validated motion detection software. Lowest DXA_{any} and DXA_{spine} T-scores were categorized (normal $\geq$ -1.0, -1.0 $>$ osteopenia $>$ -2.5, osteoporosis $\leq$ -2.5) and L1 CTHUs were measured. Analysis determined the association between CTHU < 135 and subsidence. Univariate and multivariate binary logistic regression compared the predictive performance of subsidence between CTHU and DXA.
Results: The 127-patient cohort had 96.9% degenerative pathologies, 54.3% females, median age 60 y, 2.4% osteoporosis, 44.1% CTHU < 135, and 13.4% subsidence. CTHU < 135 ($p = 0.004$) and age ($p = 0.016$) were significantly associated with subsidence; DXA lowest T-score ($p = 0.550$) was not. The odds of subsidence were statistically significant if CTHU < 135 for crude and adjusted (OR = 4.0, 95%CI 1.2–13.9, $p = 0.029$) comparisons. The odds of subsidence were not significant if lowest T-score $<$ -1.0 for DXA_{any} and DXA_{spine} (OR = 1.8, 95%CI 0.6–4.9, $p = 0.284$ and OR = 1.1, 95%CI 0.3–4.1, $p = 0.920$, respectively).
Conclusion: CTHU < 135 was associated with subsidence while DXA lowest T-score was not in patients with degenerative pathologies. The odds of subsidence were 4.0 times higher for CTHU < 135 after controlling for known risks, supporting this cutoff value. This study suggests that CTHU is a more reliable predictor of subsidence than DXA when assessing degenerative spinal pathologies and is a useful tool for assessing bone quality when planning lumbar surgery.

P773
EFFICACY OF BISPHOSPHONATES IN THE TREATMENT OF SECONDARY OSTEOPOROSIS DURING PEDIATRIC RHEUMATIC DISEASES: A SYSTEMATIC REVIEW

L. Rouached[1], R. Tekaya[1], I. Mahmoud[1], O. Saidane[1], S. Bouden[1], A. Ben Tekaya[1], L. Abdelmoula[1], C. Dziri[2]

[1]Rheumatology Dept., Charles Nicolle Hospital, [2]Honoris, Tunis, Tunisia

Objective: Children with chronic rheumatic diseases are at risk for bone loss and subsequent fractures. Bisphosphonates (BSP) are prescribed with increasing frequency to children with secondary osteoporosis; however, the efficacy of these agents remains unclear. The aim of the study is to investigate, through a systematic review of the literature, the efficacy of BSP in children with osteoporosis associated with rheumatic diseases.
Methods: We searched the Medline (via PubMed), Scopus, Cochrane Library and ISI Web of Science. We systematically selected articles (randomized controlled trials, cohorts and case–control studies), published between 2000 and 2023 of BSP in children under 18 y of age, in the context of secondary osteoporosis associated with rheumatic diseases. Two reviewers independently extracted data and assessed quality.
Results: Thirteen studies (n = 285 children) discussing the efficacy of BSP in children with rheumatic disease were included. BSP examined were oral alendronate (6 studies), oral etidronate (one study) and intravenous (IV) pamidronate (three studies), alendronate IV (one study) and zoledronic acid IV (two studies). Mean duration of treatment was 1.8 y [0.5–6]. Percent change or Z-score change in lumbar spine (BMD) from baseline were consistently reported: seven studies carried out between-group analyses (study group and control group): six studies showed significant difference (using alendronate (4), zoledronic acid (1) and pamidronate (1), six other studies (case series) demonstrated a positive effect of treatment on lumbar spine BMD. Fractures were reported for only two patients under BSP vs. 12 in the control group. Bone metabolism parameters were evaluated in eight studies, they were significantly decreased under BSP except in two studies.
Conclusion: Our systematic review revealed the efficacy of BSP on bone density in secondary osteoporosis associated to pediatric rheumatic diseases. The results justify further evaluation of the effect of BSP among children with osteoporosis.

P774
DETERMINANTS OF ABSENTEEISM AMONG CHRONIC LOW BACK PAIN MALE PATIENTS

L. Rouached[1], S. Ben Dhia[1], T. Bjeoui[1], S. Bouden[1], A. Ben Tekaya[1], I. Mahmoud[1], R. Tekaya[1], O. Saidane[1], L. Abdelmoula[1]

[1]Charles Nicolle Hospital, Dept. of Rheumatology, Tunis, Tunisia

Objective: Low back pain (LBP) is a common cause of workplace absenteeism. Our study aimed to identify determinants of absenteeism in male patients with chronic LBP.

Methods: We performed a cross-sectional study over 12 months in the rheumatology department of Charles Nicolle Hospital. We included male patients with chronic LBP. Patients' characteristics and pain characteristics (intensity with visual analogic scale (VAS), duration and radicular pain) were collected. Functional limitations due to lumbar stiffness was assessed using the Lumbar Stiffness Disability Index (LSDI). Patients were screened for depression and anxiety using the Hospital Anxiety and Depression (HAD) scale. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). Patients were asked about their history of absenteeism related to LBP.
Results: 100 patients were enrolled in our study. Mean age was 52.2 ± 12.8 y and mean disease duration was 1.8 ± 0.6 y. Radicular pain was reported by 64.4% of patients. Mean VAS of pain was 62.9 ± 18.7/100. Low back pain related absenteeism was reported by 70.3% of patients. Mean LSDI was 45 ± 19. Mean HAD-Anxiety was 8.4 ± 4.9 with 21.8% of patients having possible anxiety symptoms and 30.7% having certain anxiety symptoms. Mean HAD-Depression was 7.9 ± 4.6 with 24.8% of patients having possible depression symptoms and 29.7% having certain depression symptoms. Mean PSQI was 9.2 ± 5.7. Absenteeism was associated with a higher disease duration (1.9 ± 0.3 vs. 1.3 ± 0.9 y; $p < 10^{-3}$) and VAS of pain (67.2 ± 16.6 vs. 52.1 ± 20.4; $p < 10^{-3}$). We also find a significantly higher LSDI (48 ± 17.8 vs. 38.1 ± 21.6; p = 0.027), HAD-A (9.2 ± 4.8 ± 6.2 ± 4.7; p = 0.005), HAD-D (8.6 ± 4.4 vs. 6 ± 4.3; p = 0.012), and PSQI (10.1 ± 5.2 vs. 6.9 ± 6.6; p = 0.013) in patients who reported absenteeism. Besides, patients who reported radicular pain had higher rates of absenteeism (OR = 5.7; $p < 10^{-3}$; CI [2.2–14.7]).
Conclusion: LBP related absenteeism was associated with pain intensity, duration, radicular pain, lumbar stiffness related disability, anxiety, depression, and sleep quality disturbances. This empathizes the importance of a thorough screening and management of disease impact in addition to pain management in chronic LBP patients.

P775
FACTORS ASSOCIATED WITH DISABILITY IN MALE PATIENTS WITH CHRONIC LOW BACK PAIN

L. Rouached[1], S. Ben Dhia[1], T. Bjeoui[1], S. Bouden[1], A. Ben Tekaya[1], I. Mahmoud[1], R. Tekaya[1], O. Saidane[1], L. Abdelmoula[1]

[1]Charles Nicolle Hospital, Dept. of Rheumatology, Tunis, Tunisia

Objective: Low back pain (LBP) is a common condition and one of the major causes of disability [1]. The aim of this study was to identify factors associated with disability in male patients with chronic LBP.
Methods: We conducted a cross-sectional study in the rheumatology department of Charles Nicolle Hospital. Male patients with chronic LBP were included over 12 months. Patients' characteristics and pain characteristics (intensity with visual analogic scale (VAS), neuropathic pain score Douleur Neuropathique en 4 Questions (DN4)) were collected. We assessed LBP related disability with the Oswestry Low Back Disability Questionnaire (ODI). Patients were screened for depression and anxiety using the Hospital Anxiety and Depression (HAD) scale. Sleep quality was assessed using Pittsburgh Sleep Quality Index (PSQI).
Results: We included 100 patients in our study. Mean age was 52.2 ± 12.8 y. Mean BMI was 25.5 ± 4.6 kg/m^2. Mean disease duration was 1.8 ± 0.6 y. Low back pain was associated with radicular pain in 64.4% of patients. Mean VAS of pain was 62.9 ± 18.7/100 and mean DN4 was 2 ± 2.2/10 with 21% having a positive DN4 score (≥ 4). Mean ODI was 42 ± 19. Disability was minimal (0–20%) in 19.8% of patients, moderate (21–40%) in 19.8%, severe (41–60%) in 42.6%, and 15.8% of patients were crippled (61–80%). Sedentary behaviour was reported by 46.5% of patients. Mean HAD-Anxiety, HAD-Depression, and PSQI were 8.4 ± 4.9, 7.9 ± 4.6, and 9.2 ± 5.7, respectively. Sedentary behaviour was associated with a higher ODI (46.7 ± 16.7 vs. 37.7 ± 20.3; p = 0.020). Besides, a positive correlation was found between ODI and HAD-A (r = 0.259; p = 0.010), HAD-D (r = 0.282; p = 0.005), VAS of pain (r = 0.496; $p < 10^{-3}$), DN4 score (r = 0.254; p = 0.016), and PSQI (r = 0.314; p = 0.002). No correlation was found between ODI and age, BMI, or disease duration.
Conclusion: Disability in chronic LBP male patients was associated with neuropathic pain, sedentary behaviour, anxiety, depression, and sleep disturbances. This highlights the importance of a comprehensive and multimodal approach to patient care.
Reference: (1) Malik KM, et al. Anesth Pain Med 2018;8:e85532.

P776
INFLUENCE OF INSOLATION LEVEL ON CHANGES IN BONE METABOLISM IN POSTMENOPAUSAL WOMEN

L. S. Abboskhujaeva[1], N. M. Alikhanova[2], F. A. Takhirova[2], G. G. Akramova[1], M. M. Shakirova[1]

[1]Republican Specialized Scientific and Practical Center of Endocrinology Acad. Ya.Kh. Turakulov, [2]Institute of Health and Strategic Development, Tashkent, Uzbekistan

Objective: Osteoporosis is a major global health problem in the future, and improved methods for diagnosing and preventing this disease may be beneficial. The goal is to study the indicators of bone metabolism in postmenopausal women depending on the level of insolation.
Methods: As part of the study, a survey and examination of 155 women over 50 and under 70 years old in the city of Tashkent was conducted. To measure mineral density, DXA was performed, and anthropometric and laboratory data were also used.
Results: Indicators of calcium-phosphorus metabolism and markers of bone remodeling in postmenopausal women were within the reference values of the set. Severe vitamin D deficiency was present in 26.7% of those examined, deficiency and insufficiency in 29.7% and 20.9% of women, respectively. β-CrossLaps and PTH above the reference value occurred in 33.1% and 7.0% of women, respectively. Of the 51 women whose osteocalcin levels were determined, 13.7% had a marker above the reference range. Of 155 postmenopausal women, 72 (46.5%) women had normal BMD, 61 (39.4%) had osteopenia, and 22 (14.2%) had osteoporosis. Average values of the T- score of the femoral neck (winter: right -1.44 ± 0.89; and left -1.48 ± 0.8; summer: right -1.42 ± 0.8; and left -1.38 ± 0.8), regardless of the time of year, corresponded to osteopenia. The number of women with fractures of various locations in the groups with nBMD and osteopenia was significantly lower than in the osteoporosis group (Normal—Osteoporosis—OR 0.18; 95%CI 0.05–0.62; p = 0.01; Osteopenia—Osteoporosis—OR 0.18; 95%CI 0.05–0.65; p = 0.01).

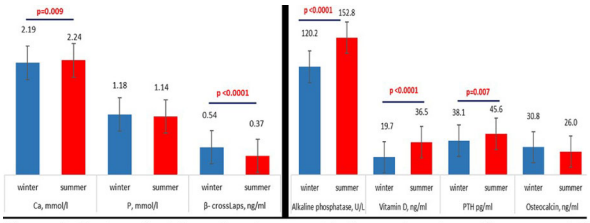


Figure. Indicators of calcium-phosphorus metabolism and markers of bone remodeling in postmenopausal women

Conclusion: Our results showed a positive effect of vitamin D during periods of high insolation in postmenopausal women; for this reason, calcium and vitamin D supplementation should be recommended as a strategic option to prevent early postmenopausal bone loss.

P777
VITAMIN D AND FGF23 LEVELS IN THE ROLE OF REGULATING MINERAL HOMEOSTASIS

N. M. Alikhanova[1], L. S. Abboskhujaeva[2], G. G. Akramova[2], F. A. Takhirova[1], C. H. B. Musakhanova[3]

[1]Institute of Health and Strategic Development, [2]Republican Specialized Scientific and Practical Center of Endocrinology Acad. Ya.Kh. Turakulov, [3]Republican Specialized Scientific and Practical Medical Center of Endocrinology named after acad. Turakulova E.H., Tashkent, Uzbekistan

Objective: FGF23 has become an important regulator of phosphate and vitamin D homeostasis. It has now been established that FGF23 regulates not only phosphate homeostasis, but also vitamin D metabolism. However, unlike PTH, FGF23 inhibits rather than stimulates the activity of 1-α-hydroxylase and calcitriol synthesis. The goal is to evaluate changes in the level of FGF23 as a regulator of phosphate and vitamin D homeostasis depending on the level of vitamin D doses taken in women over 50 y of age.
Methods: The women examined were divided into 3 groups: 1) a group with natural synthesis of vitamin D, depending on the degree of insolation; 2) a group with minimal intake of vitamin D supplements, less than 5000 IU/d; 3) a group with vitamin D supplementation, more than 10,000 IU/d.
Results: A comparative analysis showed that PTH values in the 3 compared groups increased by 1.2;1.2 times both after the summer period and after taking supplements in small doses, and in the group taking large doses (10,000 IU daily), a decrease of 1.2 times was observed, respectively. The reliability has not been revealed. The average values of PTH were 51; 44 and 40.1 ng/ml. A decrease in such an indicator as FGF23 by 3.7 times, 9.9 and 7.4 times in the compared groups also indicates a decrease in bone resorption. Thus, in all the compared groups, changes in bone mineral metabolism indicators indicate an increase in the active absorption of calcium ions in intestinal enterocytes and, as a result, a decrease in resorption and an increase in bone formation.

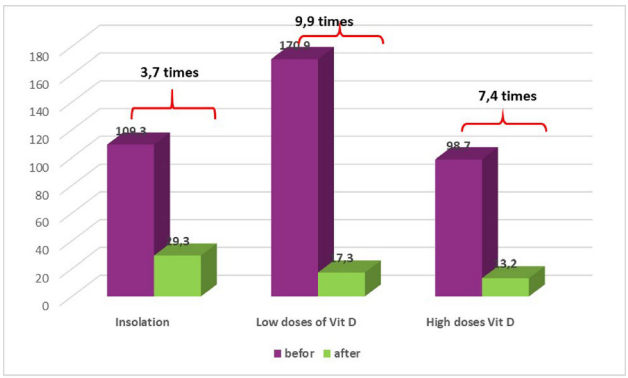


Figure. Changes in FGF23 levels in the three compared groups before and after increasing vitamin D.

Conclusion: Vitamin D levels within normal values are important for the body not only as regulators of calcium and phosphorus homeostasis, but also for reducing FGF23.

P778
VITAMIN D AND ITS POTENTIAL INTERACTION WITH PAIN

N. M. Alikhanova[1], L. S. Abboskhujaeva[2], G. G. Akramova[2], F. A. Takhirova[1], M. M. Shakirova[2], C. H. B. Musakhanova[3]

[1]Institute of Health and Strategic Development, [2]Republican Specialized Scientific and Practical Center of Endocrinology Acad. Ya.Kh. Turakulov, [3]Republican Specialized Scientific and Practical Medical Center of Endocrinology named after acad. Turakulova E.H., Tashkent, Uzbekistan

Objective: Vitamin D deficiency is common in patients with chronic pain and in healthy people, but no difference has been reported between them; thus, it remains to be confirmed whether there is a link between vitamin D deficiency and chronic pain. Osteoporosis is a common disease in chronic pain disorders. The goal is to assess the frequency of pain and fractures of various locations depending on the level of insolation.
Methods: A comparative analysis of the frequency of pain and fractures in 123 postmenopausal women, depending on the degree of insolation, was carried out: in winter, when the degree of insolation is lowest and, accordingly, vitamin synthesis in the body is naturally lowest. And in the first month of autumn, when after the spring–summer period, the accumulation of vitamin D in the body naturally reaches its maximum.
Results: 27.6% of the surveyed had severe vitamin D deficiency, 30.9% and 21.1% of women had deficiency and insufficiency, respectively. In one third (35.8%) of women, β-CrossLaps turned out to be higher than the reference index, and 8.1% had elevated PTH levels. Osteocalcin levels were above the reference range in 16.3% of women. Normal BMD was found in 46.3% of women, osteopenia in 32.5% and osteoporosis in 12.2%. When analyzing the questionnaires in the winter-summer section, it turned out that the number of women who experienced pain of various localization did not significantly increase (from 30.9% to 38.2%; OR 0.72; 95%CI 0.43–1.23; p = 0.23). The number of fractures decreased by 2 times (from 8.9% to 4.1%; OR 2.32; 95%CI 0.78–6.88; p = 0.12).

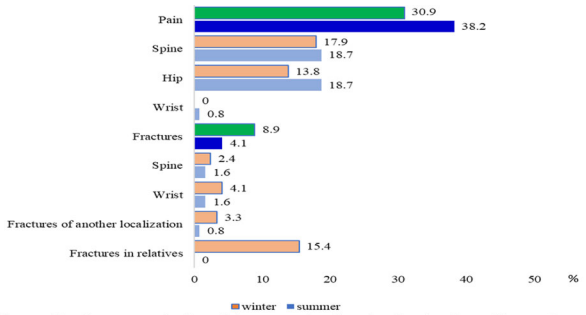


Figure. The frequency of pain and fractures of various localization depending on the season of the year.

Conclusion: The results obtained indicate a low vitamin D supply (79.7%), about half (49.6%) had a violation of mineral density. at the same time, the number of patients experiencing pain of various localization increased.

P779
BACILLUS COAGULANS AMELIORATES INFLAMMATORY BONE LOSS VIA MODULATING "BREGS-TREGS-TH17" CELL AXIS UNDER ESTROGEN DEFICIENT OSTEOPOROTIC CONDITIONS

L. Sapra[1], R. K. Srivastava[1]

[1]All India Institute of Medical Sciences, New Delhi, India

Objective: Probiotics are known to be involved in management of various-inflammatory diseases including osteoporosis. Several studies along with ours reported that probiotics showed its health promoting effects by regulating Treg-Th17 immune cell balance in host. Furthermore, various studies demonstrated that Tregs-Th17 immune cell balance can be further regulated by regulatory B cells (Bregs) in host. But no study till date had delineated the Bregs-Tregs-Th17 cell axis in case of osteoporosis i.e. "Immunoporosis". Moreover, no study investigated the immunomodulatory potential of *Bacillus coagulans* (BC) in regulating bone-health. The present study aims to examine the effect of probiotic BC on Bone Health via modulation of the host "Bregs-Tregs-Th17" cell axis in Ovx mice.
Methods: We monitored the osteoprotective effect of BC on bone health under estrogen deficient ovariectomy induced osteoporotic mice model. For the same, female C57BL/6 mice of 8–10 weeks were divided equally in three groups as Sham/control group, Ovx group and Ovx + BC group (received 10^9 cfu/ml/d BC orally) for a period of 45 days. At the end of experiment mice were sacrificed and tissues analysed for various parameters to access the role of BC administration on bone-health by using several cutting-edge technologies such as SEM, AFM, μCT, FACS and ELISA. Furthermore, we assessed the ability of BC induced Bregs in modulating osteoclastogenesis and in inducing Tregs and Th17 cell differentiation under in vitro conditions. 16S rRNA and gut integrity analysis were performed for evaluating the effect of BC administration on gut dysbiosis in Ovx mice model.
Results: Our in vivo data suggested that administration of BC attenuated bone loss in Ovx mice. Both the cortical and trabecular bone-content of Ovx + BC treated group was significantly higher than Ovx-group. Remarkably, the percentage of osteoclastogenic $CD4^+Ror\gamma t^+$ Th17 cells at distinct immunological sites such as bone marrow (BM), mesenteric lymph nodes (MLN) and Peyer's patches (PP) were significantly reduced ($p < 0.01$), whereas the percentage of anti-osteoclastogenic regulatory T cells (Tregs); $CD4^+Foxp3^+$ was significantly enhanced ($p < 0.01$) in BC treated group, thus resulting in inhibition of bone loss. Moreover, BC administration also significantly enhanced ($p < 0.01$) the population of $CD19^+CD1d^{hi}CD5^+$ Bregs in Ovx + BC group. The immunomodulatory role of BC was further supported by serum cytokine data with a significant reduction in proinflammatory cytokines (IL-6, IL-17 and TNFα) along with enhancement of anti-inflammatory cytokines (IL-10, IFNγ) in BC treated group. Furthermore, we observed that BC administration improves the bone health via improving the gut integrity and restoring the diversity of gut commensals under estrogen deficient conditions.
Conclusion: We propose for the first time that osteoprotective role of BC on bone health is mediated via its effects on the "Bregs-Treg-Th17" cell axis which further regulates osteoclastogenesis. The present study thus highlights the potential of probiotic BC as a novel osteoprotective agent in the treatment and management of bone related diseases including osteoporosis.

P780
DEVELOPMENT OF A NOVEL RESNET-BASED DEEP LEARNING MODEL FOR ACCURATE DIAGNOSIS OF OSTEOPOROSIS VIA 3D COMPUTED TOMOGRAPHY SCANS OF THE SPINE

L. Shaw[1], C.-H. Lin[2], Y.-H. Lin[3], K.-C. Tu[1], H.-T. Shih[1], Y.-H. Lin[1], Y.-P. Lai[1], K.-H. Chen[1]

[1]Dept. of Orthopedic Surgery, Taichung Veterans General Hospital, [2]Dept. of Computer Science and Engineering, National Chung Hsing Univ., [3]Dept. of Radiation Oncology, Taichung Veterans General Hospital, Taichung, Taiwan, Taichung, Taiwan

Objective: Computed tomography (CT) scans have become indispensable diagnostic tools in modern medicine, with the lumbar spine frequently being included in these examinations. In our study, we propose to develop a ResNet model that utilizes 3D CT imaging of the spine, integrating advanced AI techniques to enhance the accuracy and efficiency of osteoporosis diagnosis.
Methods: We retrospectively reviewed patients with both DXA and spinal CT scans during 2011–2022. CT scans were loaded into the deep learning model TotalSegmentator for structure annotation. After annotation, the 3D CT images of the lumbar spine were segmented using Python. The image classification model was established based on ResNet architecture. We simulated normal lumbar spine through data augmentation with random rotating and scaling the original images to avoid model overfitting. Validation dataset was performed once after each training epoch. Model with epoch 49 was chosen to perform the test dataset.
Results: Our analysis of 414 lumbar spines revealed that 45% were normal, 28% osteopenia, and 27% osteoporotic, based on DXA diagnostics. The model achieved an AUC of 0.99, 0.99, and 1.00 for normal bone quality, osteopenia, and osteoporosis, respectively. The accuracy of osteoporosis diagnosis is 91.67% with sensitivity 88.89% and specificity 94.44%. The positive predictive value of osteoporosis is 94.12%.

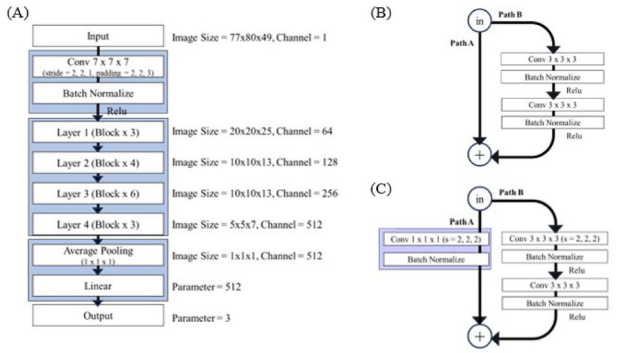


Figure 1. Figure A is our model architecture, which is generally divided into three parts: image reduction layer, residual block layers and output layer. Figure B is the residual block focused on image feature extraction. Figure C is also residual block, which shrank image while extracting image feature

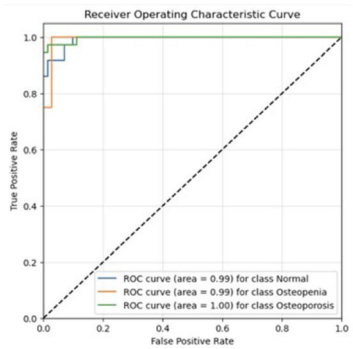


Figure 2. ROC curve for the model diagnosis accuracy. The AUCs of normal bone quality, osteopenia and osteoporosis are 0.99, 0.99 and 1.00.

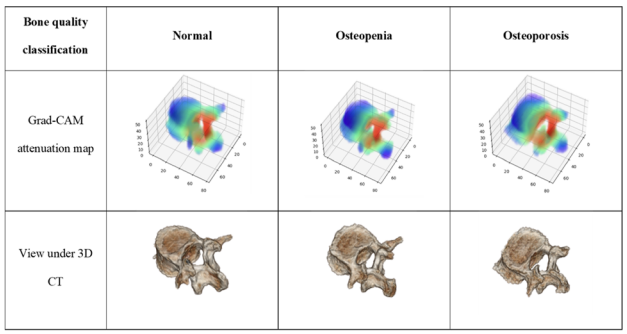


Figure 3. Grad-CAM visualization of the last convolutional layer in our ResNet model, demonstrating examples from normal bone quality, osteopenia, and osteoporosis groups. Each image below is the corresponding Grad-CAM heatmap, with bright red areas indicating regions most impactful in the model's osteoporosis screening.

Conclusion: The proposed ResNet model represents a promising and reliable auxiliary tool for the diagnosis of osteoporosis using 3D CT scans.

P781
GRAPHENE QUANTUM DOTS ERADICATE RESISTANT AND METASTATIC OSTEOSARCOMA BY ENHANCED INTERFACIAL INHIBITION

L. Shen[1], Y. Su[1], K. Ye[1], Y. Wang[1], B. Geng[2], D. Pan[2]

[1]Dept. of Orthopedic Surgery, Shanghai Sixth People's Hospital Affiliated to Shanghai Jiao Tong Univ. School of Medicine, [2]School of Environmental and Chemical Engineering, Shanghai Univ., Shanghai, China

Objective: Cancer stem cells (CSCs) with distinctive self-renewal, proliferation and differentiation capabilities, are responsible for tumor initiation, metastasis, relapse and drug resistance. However, CSCs are resistant to chemotherapy, leading to drug efflux and an inability to completely eliminate them. It is thus desirable to design intrinsically bioactive yet structurally simple nanoparticles that could target and eliminate CSCs without dependence on the use of CSC-targeted molecules or delivery systems.

Methods: We prepared graphene quantum dots (GQDs) by a microwave-assisted approach using julolidine as the precursor, ethanol and benzoic acid as the reaction media. Firstly, we examined the inhibitory effects that GQDs and representative cytotoxic agents can exert on the blockage of the metastatic process of osteosarcoma in the initial stages, migration and invasion, using transwell assay and scratch assay. Then, we established in vivo models of osteosarcoma lung metastasis to evaluate GQDs induced remote metastasis suppression. At last, we investigated whether GQDs can inhibit the proliferation of multiple cancer cells with multidrug resistance (MDR) phenotypes and further evaluated whether GQDs possessed the capability to reverse MDR for sensitization of various small-molecule drugs.

Results: As a new single drug, GQDs can block the lung metastasis of osteosarcoma regardless of high expression of drug efflux transporters. Enhanced interfacial inhibition effects on eradicating drug-resistant CSCs can be induced by self-insertion of bioactive GQDs into DNA major groove (MAG) sites in cancer cells. Since transcription factors regulate gene expression at the MAG site, MAG-targeted GQDs could exert greatly enhanced interfacial inhibition effects on downregulation of the expression of a collection of cancer stem genes such as *ALDH1*, *Notch1*, and *Bmi1*. Moreover, the nanoscale interface inhibition mechanism enables the reversal of cancer MDR by inhibition of *MDR1* gene expression by using the GQDs at non-toxic concentration (1/4 × IC_{50}) as the MDR reverser.

Conclusion: Our findings decipher the enhanced nano-bio interface inhibition effects at the MAG site on eradicating CSCs in prevention of cancer metastasis and recurrence. Given high efficacy in interfacial inhibition, CSC-mediated migration, invasion and metastasis of cancer cells can be substantially blocked by MAG-targeted GQDs, which can also be harnessed to sensitize clinical cytotoxic agents for improved efficacy in combination chemotherapy.

P782
CHRONIC PAIN SYNDROME IN PATIENTS WITH POLYARTHRITIC VARIANT OF PSORIATIC ARTHRITIS ON THE BACKGROUND OF BASELINE THERAPY

L. Shilova[1], S. Spitsina[2]

[1]Volgograd State Medical Univ., [2]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd State Medical Univ., Volgograd, Russia

Objective: To evaluate the severity of chronic pain syndrome in patients with polyarthritic variant of psoriatic arthritis (PsA) on the background of baseline therapy with methotrexate.

Methods: 20 patients diagnosed with PsA according to CASPAR 2006 criteria with predominant joint involvement were examined. All patients were on basic anti-inflammatory therapy: they took methotrexate for more than 6 months. Disease activity was assessed using DAS28-CRP(4) and DAPSA indices, as well as visual analog scale (VAS) of disease activity. The severity of joint syndrome was determined by patient-rated VAS of pain, the number of swollen (VAS) and painful joints (VAS). Quality of life was assessed by BASDAI, SF-36, HAQ-DI questionnaires; the level of depression was assessed by QIDS SR-16.

Results: Among PsA patients there were 16 (80%) men, 4 (20%) women. The age of the patients was 45.8 ± 8.74 y, and the duration of the joint syndrome ranged from 6 months to 9 y. All patients were taking methotrexate as an OTC drug at a dose of 10 to 20 mg/week, as well as various NSAIDs. All patients (100%) had moderate disease activity according to DAS28-CRP(4) (4.2–5.1 points), DAPSA index (18–27.4 points). The patient-rated VAS showed 58.9 ± 6.2 mm of disease activity and the physician-rated VAS was 56.5 ± 4.3 mm. The mean number of painful and swollen joints was 14.2 ± 6.7 and 6.8 ± 0.56, respectively. The severity of pain in joint syndrome by VAS measured by the patient was 64.8 ± 5.1 mm. The obtained indices indicate the presence of PsA activity in patients, as well as a pronounced pain syndrome persisting despite the conducted baseline therapy. The presence of pain and functional limitations had a negative impact on all quality of life parameters. According to the SF-36 questionnaire, there were deviations in both physical (36.5 ± 7.9) and mental (39.2 ± 6.3) components. HAQ-DI values ranged from minimal to moderate decrease in quality of life (0.65–1.3), BASDAI index was 3.8 ± 0.46. The level of depression was assessed by the QIDS SR-16 questionnaire, which corresponded to a mild degree of depression. A negative correlation between PsA activity, pain syndrome severity, number of painful joints and indices of quality of life and depression was revealed.

Conclusion: Patients with PsA with predominantly polyarthritic variant do not achieve a low degree of disease activity or remission despite methotrexate therapy. Also, patients have a prolonged pain syndrome characterized by the severity and involvement of a sufficient number of joints in the pathological process, which negatively affects both physical and mental health indicators, including the development of a mild degree of depression. The multicomponent nature of chronic pain syndrome in PsA, the presence of a large number of factors affecting it, need further study.

P783
OSTEITIS FIBROSA CYSTICA RECOVERY FOLLOWING PARATHYROIDECTOMY FOR PRIMARY HYPERPARATHYROIDISM: A CASE SERIES AND REVIEW OF LITERATURE

Y. E. F. Eden Friedman[1], A. J. Jabarin[1], G. S. Shlomai[1], I. V. Vered[1], I. E. Eshed[2], L. T. S. Tripto-Shkolnik[1]

[1]Division of Endocrinology, Diabetes and Metabolism, [2]Dept. of Diagnostic Imaging, Sheba Medical Center, Ramat Gan, Israel

Objective: Osteitis fibrosa cystica (OFC) is an extreme manifestation of accelerated bone resorption in primary hyperparathyroidism (PHPT), rarely encountered nowadays. BMD gain following parathyroidectomy (PTx) is well documented, while little is known regarding the timeline of re-mineralization and recovery of the lytic lesions.

Methods: We present three patients with clinical, biochemical, and advanced (computer tomography or magnetic resonance) imaging post-PTx follow-up and review published similar OFC patient cases reporting serial imaging of bony lesions following PTx.

Results: The main baseline patient's characteristics are presented in Table 1. All patients received calcium, magnesium, and alfacalcidol supplementation post PTx; and serum calcium, PTH and alkaline phosphatase normalized gradually. Patients 1 and 2 demonstrated an impressive re-mineralization of pelvic lytic lesions within 6 and 12 months following PTx, respectively. Patient 3 had partial remineralization in the C4-C5 vertebrae in 6 months, which continued to progress 18 months after PTx. We summarized reports of fifty-four patients with PHPT and OFC, assessed for lytic lesion recovery after PTx with different imaging modalities. Most lesions were partially remineralized within 6–12 months. Near-complete remineralization was evident in 38 (70.3%) on the last imaging follow-up.

Table 1- main patients' characteristics

	Patient 1	Patient 2	Patient 3
Age at diagnosis	24	41	67
Gender	Female	Male	Male
PTH, x ULN	12.7	26.3	16
Albumin corrected Calcium mg/dl	13.2	13.9	13.8
25-OH-Vitamin D, ng/ml	12.5	5.7	10
Alkaline phosphatase, x ULN	4.8	10.2	2.5
Location of lytic lesions	Mandible, ilium, ischium, femoral shaft	Ilium, ischium, vertebras	Cervical vertebra, ilium, femoral neck and trochanter
Salvage orthopedic intervention	Intramedullary nailing of left femur (after PTx)	None	Corpectomy of level C4-C6 and excision of the extramedullary lesion (Before PTx)

Key: PTH- parathyroid hormone; PTx- parathyroidectomy; ULN- upper limit of normal

Conclusion: Lytic lesions of OFC undergo recovery following successful PTx; however full mineralization may take longer than a year. This timeline should be taken into account when considering the possibility of salvage orthopedic surgery. Active surveillance may be advised in most cases, excluding large lesions in weight-bearing areas, which are more prone to fracture.

P784
APPROPRIATE MECHANICAL STIMULATION INHIBITS THE SENESCENCE OF CHONDROCYTES

L. Wang[1], J. Zhao[1]

[1]Shanghai Jiaotong Univ., Shanghai, China

Objective: Osteoarthritis and related joint diseases are increasingly prevalent, significantly impacting the quality of life globally. A critical component in the progression of these diseases is the senescence of chondrocytes, the cells responsible for maintaining healthy cartilage. Recent advancements in biomechanics suggest that controlled mechanical stimulation may retard the senescence process in these cells. This study aims to elucidate the impact of varying degrees of mechanical stimulation on chondrocyte senescence, providing insights potentially transformative for therapeutic approaches in joint disease management.
Methods: We employed an advanced RNA sequencing technique to analyse the genomic expressions of chondrocytes subjected to three different levels of mechanical stimulation: none (0%), mild (10%), and moderate (20%). The mechanical stresses were applied using a custom-designed bioreactor, which allowed precise control over the duration and intensity of the stimuli. This approach enabled a comprehensive comparison of the cellular responses to different mechanical environments.
Results: Our results offer a nuanced view of the chondrocyte response to mechanical stress. In the absence of mechanical stimulation, chondrocytes showed signs consistent with typical senescence processes. Interestingly, under mild mechanical stimulation (10%), there was an upregulation of genes associated with inflammation, paradoxically coupled with a downregulation of senescence markers, suggesting a protective response against cellular senescence. However, increasing the mechanical load to 20% led to a marked increase in stress responses and degenerative markers, indicative of cell damage and accelerated senescence processes. These findings highlight a delicate balance between beneficial and detrimental mechanical forces on chondrocyte health.
Conclusion: The study underscores the critical role of mechanical forces in chondrocyte physiology and senescence. Mild mechanical stimulation appears to confer a protective effect against senescence, while excessive mechanical stress induces cellular damage and degeneration. These insights open avenues for targeted biomechanical therapies in osteoarthritis, where controlled mechanical stimuli could be harnessed to slow down or even reverse cartilage degeneration. Future research should aim to fine tune these mechanical interventions to optimize therapeutic outcomes in joint disease treatments.

P785
DURABLE IMMUNOMODULATORY HIERARCHICAL PATCH FOR ROTATOR CUFF REPAIRING

L. Wang[1], J. Zhao[1]

[1]Shanghai Jiaotong Univ., Shanghai, China

Degradable shoulder cuff patches, followed over five years, have been observed to exhibit high re-tear rates exceeding 50%, which is attributed to the inability of degradable polymers alone to restore the post-rotator cuff tear (RCT) inflammatory niche. Herein, poly(ester-ferulic acid-urethane)urea (PEFUU) was developed, featuring prolonged anti-inflammatory functionality, achieved by the integration of ferulic acid (FA) into the polyurethane repeating units. PEFUU stably releases FA in vitro, reversing the inflammatory niche produced by M1 macrophages and restoring the directed differentiation of stem cells. Utilizing PEFUU, hierarchical composite nanofiber patch (HCNP) was fabricated, simulating the natural microstructure of the tendon-to-bone interface with an oriented-random alignment. The incorporation of enzymatic hydrolysate derived from decellularized Wharton jelly tissue into the random layer could further enhance cartilage regeneration at the tendon-to-bone interface. Via rat RCT repairing model, HCNP possessing prolonged anti-inflammatory properties uniquely facilitated physiological healing at the tendon-to-bone interface's microstructure. The alignment of fibers was restored, and histologically, the characteristic tripartite distribution of collagen I – collagen II—collagen I was achieved. This study offers a universal approach to the functionalization of degradable polymers and provides a foundational reference for their future applications in promoting the in vivo regeneration of various tissues.

P790
DISCONTINUATION AND NONPUBLICATION OF OSTEOPOROSIS CLINICAL STUDIES: A CROSS-SECTIONAL ANALYSIS

M. A. Abdelsalam[1], Y. J. Alabdallat[2], Y. R. Hussein[3], M. Sajed[4], M. Taha[5], R. M. Ibrahim[6], W. Z. Selima[7], A. H. Zabady[8]

[1]Rheumatology and Rehabilitation Dept., Faculty of Medicine, Misr Univ. for Science and Technology, Alfayyoum, Egypt, [2]Faculty of Medicine, Hashemite Univ.', Zarqa, Jordan, [3]Faculty of Medicine, Benha Univ., Benha, Egypt, [4]Faculty of Pharmacy, Al-Azhar Univ., Mansoura, Egypt, [5]Faculty of Medicine, Ain-Shams Univ., Cairo, Egypt, [6]Medical Research Group of Egypt (MRGE), Negida Academy, Arlington, MA, U.S., Port Said, Egypt, [7]Anesthesia, Intensive Care and Pain Management Dept., Ain-Shams Univ., Cairo, Egypt, [8]Dept. of Microbiology, Faculty of Science, Damanhur Univ., Cairo, Egypt

Objective: Over 200 million individuals worldwide have osteoporosis, which predisposes patients to low-impact fragility fractures and leads to a decline in their quality of life, along with increased morbidity, mortality, and disability. Clinical trials are predisposed to discontinuation and non-publication, which is considered a substantial challenge contributing significantly to research waste in clinical medicine. The aim of this study is to examine the reasons (rates) for terminated, discontinued, and unpublished osteoporosis clinical trials by reviewing their characteristics and exploring the logistical, financial, and practical reasons.
Methods: We extensively searched clinicaltrials.gov to identify all trials related to osteoporosis, including those that were published, unpublished, and discontinued. Until December 31, 2021, we excluded studies completed in the last 24 months, considering the potential for ongoing peer review processes. Then we used the NCT identifier number and other protocol information for each clinical trial to identify if it had been published. Information regarding gender, age, study type, funding source, intervention type, enrollment, and location was extracted and then analysed using multiple logistic regression to determine characteristics associated with unpublished and discontinued trials.
Results: A total of 413 registered studies were analysed, comprising 361 (87.4%) interventional studies and 52 (12.6%) observational studies. Among these, 25 (6%) were discontinued, with 40% not providing reasons. The second most common reason for discontinuation was recruitment issues (25%). Trials with a small sample size (less than 100) were more likely to be discontinued (20%) compared to those with a larger sample size. Among the completed studies, 226 (54.8%) remained unpublished. Logistic regression analysis revealed that trials involving drug or procedural intervention were more likely to be non-published among interventional studies. Studies exclusively including females and observational studies were also more likely to be nonpublished.

Conclusion: Osteoporosis clinical trials are frequently discontinued or left unpublished, exposing participants to potential harm without benefit. This not only poses challenges in recruiting for future trials but also leads to the inefficient utilization of limited time and financial resources in medical research. Enrollment size, gender, type of intervention, and type of study are the main predictors of unpublished studies.

P791
ASSOCIATIONS OF PRECLINICAL MANIFESTATIONS OF ATHEROSCLEROSIS OF THE CORONARY AND CAROTID ARTERIES WITH BONE STRENGTH INDICATORS IN WOMEN

M. A. Kolchina[1], I. A. Skripnikova[1], O. V. Kosmatova[1], O. Y. U. Isaykina[1], V. A. Vigodin[1]

[1]National Medical Research Center for Therapy and Preventive Medicine of the Ministry of Healthcare of the Russian Federation, Moscow, Russia

Objective: To study the associations between arterial stiffness, atherosclerotic plaques (AP) of carotid arteries and calcification of coronary vessels with BMD and markers of bone metabolism.
Methods: 357 female outpatients in the peri- and postmenopausal periods (aged 45–82) were enrolled into a cross-sectional study. Evaluation of the pulse wave velocity (PWV), augmentation index (AI) were carried out by applanation tonometry. The intima-media thickness (IMT), the presence and number of AP were studied using duplex scanning. Coronary vessels calcium deposits were registered by multispiral computed tomography using the Agatston calcium index. The BMD was measured using DXA. C-terminal telopeptide of type I collagen (CTX)—bone resorption marker was determined in blood serum using the β-CrossLaps method.
Results: In peri- and postmenopausal women, the severity of coronary artery calcification and carotid atherosclerosis negatively correlate with BMD in the spine and in the femoral neck. Calcification of the coronary arteries acted as an independent factor of bone mass reduction in all measured areas of the skeleton; the IMT complex and the presence of AP proved to be independent risk factors for low bone mass in the femoral neck. According to multivariate regression analysis, vascular rigidity indicators (PWV and AI) did not independently contribute to bone mass reduction. The chance of detecting age-adjusted AP with increased indicators of the marker of bone resorption of CTX significantly increases by 1.9 times. No associations were found between the Agatstone calcium index, vascular rigidity indices and the CTX.
Conclusion: A decrease in BMD and an increase in the marker of bone resorption, associated with subclinical atherosclerosis and, especially, calcification of coronary arteries, allows to think about the common mechanisms of development and progression of osteoporosis and atherosclerosis and about general preventive measures.

P792
CINACALCET IN THE CONSERVATIVE MANAGEMENT OF PRIMARY HYPERPARATHYROIDISM(PHPT): REAL-WORLD EXPERIENCE IN TWO TERTIALY CARE CENTERS

M. A. Martin Almendra[1], M. Ventosa[2], X. C. Vivas[1], M. T. Mories Alvarez[1], L. Cuellar[2], M. Gonzalez-Sagrado[3], C. Ochoa[4], A. Valverde[1], A. Herrero Ruiz[1], A. Sanchez[1], C. Muñoz[1], M. Delgado Gomez[1], C. Robles[1], H. Villanueva[1], R. A. Iglesias[1]

[1]Dept. of Endocrinology Hospital Universitario de Salamanca, Salamanca, [2]Dept. of Endocrinology Hospital Universitario Rio Hortega, Valladolid, [3]Dept. of Medical Investigation Hospital Universitario Rio Hortega, Valladolid, [4]Dept. of Medical Investigation Complejo Asistencial de Zamora, Zamora, Spain

Objective: To evaluate the role of cinacalcet(safety, efficacy and metabolic profile) in adults with hyperparathyroidism(PHPT) in whom parathyroidectomy was not an option.
Methods: A retrospective observational study in 126 subjects with PHPT included in pharmacy registries with active treatment during 2023. Clinical and metabolic variables at baseline, 1, 3 and 5 y of follow up were evaluated. A logistic binary regression analysis was run to predict fall in kidney function(KF).
Results:16 were male, 5 had MEN and 8 had previous surgery. Median age was 74 ± 12 y. At baseline: calcium 11,4 ± 0.6 mg/dl, phosphorus 2,6 ± 0,4 mg/dl, PTH 176 ± 93 pg/ml (range 50–625), eFGR 69,9 ± 17,7 ml/min (62–90), urine calcium excretion (UCa) 237 ± 142 mg/24 h (20–669), and 25OHD 27 ± 17 ng/ml (82,5% on supplementation). Mean cinacalcet dose was 38 ± 18 (15–180) at baseline and reached 52 ± 9 mg/d at 5th year. Calcium level fell to 9,9 ± 0,6 1 y, 9,8 ± 0,6 3 y and 9,8 ± 0,6 mg/dl 5 year (p0.001). UCa levels reduced from 228 ± 136 to 129 ± 84 mg/24 h, the difference was found to be statistically significant at 5th year (p0,005). UCA was higher in patients with renoureteral crisis than without at 3rd year (306 ± 191 vs. 164 ± 85 mg/24 h, p0,007). KF decreased in 43% at 1 y, 53% 3 y and 50% at 5 y. In multiple regression analysis (group of fall in KF taken as reference), UCA elevation was the only significant variable (OR 0,26 95%CI 0,71–0,84 p0.025). No other significance was found. The tolerance was excellent in 94%, 6% had digestive symptoms. 5 patients required withdrawal (3 hypocalcemia, 1 myoclonus, 1 unknown). 6 had hypercalcemic crisis before treatment and 4 during treatment. Surgery was required on 8 patients. 5 patients died (1 vascular event, 4 urinary sepsis).
Conclusion: When indicated to reduce serum calcium, cinacalcet is effective and safe along 5y in an elderly population with PHPT. Vitamin D deficit is common and requires supplementation. Cinacalcet is well tolerated and rarely needs to stop. Finally, UCA suggests to affect KF along treatment.

P793
FEMORAL NEUROPATHY SECONDARY TO ILIACUS HEMATOMA AND VASTUS MEDIALIS TEAR PRESENTING AS LEFT ANTEROMEDIAL THIGH MASS IN A PATIENT ON ANTICOAGULANT THERAPY: A CASE REPORT

G. A. Macapagal[1], M. A. Ongchuan[1]

[1]Dept. of Physical Medicine and Rehabilitation Philippine Orthopedic Center, Quezon City, Philippines

Femoral compressive neuropathy secondary to iliacus hematoma is a rare condition. This case was further complicated by a concomitant distal thigh mass due to a vastus medialis tear more visible upon change in positioning during ultrasound study.
Case report: This is a case about a 39-year-old male on warfarin therapy who noted sudden onset hip and thigh pain after kicking a concrete wall. He was diagnosed with Left iliacus muscle hematoma which was successfully drained with percutaneous pigtail catheter. After discharge, he sought consult in our clinic due to persistent inability to extend the Right leg associated with difficulty in ambulation and a mass on the Left distal anterior thigh. Ultrasound imaging revealed myotendinous tear of the vastus medialis which was visualized more clearly on standing position. Neurophysiologic evaluation revealed femoral neuropathy above the inguinal ligament. He

underwent outpatient therapy with subsequent improvement in quadriceps muscle strength and ambulation.
Conclusion: Femoral neuropathy due to iliacus hematoma, as well as the possibility of another remote lesion, should always be considered in a patient on anticoagulant therapy. Ultrasound assessment in suspected tears should be supplemented by changes in positioning or dynamic maneuvers to increase its sensitivity.

P794
RELATIONSHIP BETWEEN VITAMIN D LEVELS AND BONE MINERAL DENSITY IN TRANSGENDER POPULATION

M. A. Rueda[1], N. Camargo[1], A. Sierra[1]

[1]Fundacion Universitaria de Ciencias de la Salud. Sociedad de Cirugia de Bogotá, Hospital San José, Bogotá, Colombia

Objective: To describe the relationship between vitamin D levels and densitometric results of transgender patients (TP) prior to the start of affirmative hormone therapy (AHT) evaluated in 2 experience centers in Bogotá, Colombia.
Methods: Case series that includes 9 TP, in whom measurements of serum 25-OH vitamin D (VitD) and bone densitometry by DXA method were performed prior to the start of AHT.
Results: Six patients were transwomen (TW) and three were transmen (TM). The average age was 29.7 y. 100% of the VitD level measurements were in the range of insufficiency and deficiency, of which 5 patients had levels less than 15 ng/ml. Regarding the densitometric findings, in the lumbar spine, the average BMD value was 1.088, in 2 TW a Z-score $\leq$ -2 (22.2% of the patients), the other measurements were in normal range. In the hip, the average BMD was 0.937 (mentioned in only 6 reports), with normal Z-scores in both the femoral neck and the total hip. No patient had presented fragility fractures.
Conclusion: VitD levels and bone mineralization are influenced by AHT (1), hence the importance of knowing the state of bone health prior to its initiation. Published studies have reported that vitD deficiency has increased both in the TP and in the general population, due to nutritional and social factors and increased use of sunscreens (2,3), which is consistent with our findings. An essential factor in this population is the lesser development of their daily activities outside in relation to their dysphoric condition, with poor sun exposure and less physical activity. Regarding the densitometric findings, it is consistent with previous studies that a better state of bone mineralization is found in TM compared to TW, due to less sports activity, which also contributes to less development of muscle mass, and a lower peak bone mass. According to our experience, vitD levels and evaluation of BMD should be part of routine screening prior to starting THA.
References:
1. Chen H, et al. J Clin Endocrinol Metab 2019;104:2728
2. Van Caenegem E, et al. Osteoporos Int 2015;26:35
3. Giacomelli G, Meriggiola MC. Ther Adv Endocrinol Metab 2022;13:20,420,188,221,099,346

P795
GENDER DIFFERENCES IN DISEASE CHARACTERISTICS, COMPLIANCE, AND OUTCOMES USING TREAT-TO-TARGET APPROACH IN AXIAL SPONDYLOARTHRITIS (AXSPA)

M. A. Saeed[1], H. Ahmad[2], A. Ahmed[3], H. Ahmed[1]

[1]Central Park Medical College, Lahore, Pakistan, [2]Central Park Medical College, [3]Rashid Latif Medical College, Lahore, Pakistan

Objective: There has been wide variability in terms of gender reported from different ethnic and geographic backgrounds. In low and middle-income countries it is further complicated due to issues of access and gender discrimination. Data are scarce in general about axSpA from Pakistan and in particular about gender differences. We aimed to compare the demographic characteristics, disease activity scores at baseline, compliance, and outcome of treat to-target (T2T) approach between both genders in patients with axSpA in a real-world setting.
Methods: This is the first retrospective analysis looking at gender differences in a cohort set up with the support of the Arthritis Care Foundation enrolling patients from two academic rheumatology departments and affiliated clinics in Lahore Pakistan. All patients who were enrolled gave an informed consent. Patients were diagnosed as axSpA as per ASAS classification criteria. Data regarding demography, disease parameters, and outcome measures like Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) and Assessment of Spondyloarthritis Disease Activity Score (ASDAS)-CRP were retrieved from electronic medical records. Compliance to Treat to target strategy in both groups was assessed by adaptations to treatment as per Assessment of SpondyloArthritis International Society (ASAS) recommendations performing ASDAS-CRP scores on at least 2 visits during the minimum follow-up of 6 months. For analysis data was entered into SPSS version 26.
Results: There were a total of 270 axSpA patients enrolled from November 2019 to December 2023. Out of these, there were 218 (80.7%) men and 52 (19.3%) women. Women were found to be older than their counterparts at presentation (p = value 0.001). There was no statistically significant difference between the two genders in terms of disease duration at their first visit. However, there were more men with positive HLA-B 27 status 150 (69.4%) vs. 26 (50.0%), p = 0.000. There was no statistically significant difference In the frequency of peripheral arthritis and uveitis. Females were reported to have higher BASDAI scores at baseline (p = 0.003). Compliance to T2T by treating rheumatologists in terms of escalation of treatment was higher in male patients leading to higher use of biologic or targeted synthetic modifying rheumatic drugs (tsDMARDs) in men (46 vs. 22% p = 0.002). For a detailed comparison of outcome measures see Table 1.

Table 1. Comparison of baseline demography, disease parameters, and outcome measures between the two genders

Variable	Male	Female	P=value
Age mean±SD	31.9±10.2	37.6±12.4	0.001
HLA B27 n (%)	150 (69.4)	26 (50.0)	0.000
Peripheral Arthritis n (%)	57 (26.4)	13 (25.0)	0.838
Uveitis n (%)	20 (9.3)	8 (15.4)	0.195
Radiographic axSpA n (%)	184 (84.4)	39 (75.0)	0.108
Non-Radiographic axSpA n (%)	34 (15.6)	13 (25.0)	0.108
Follow-up duration in months mean±SD	39.2±39.1	26.7±35.7	0.036
BASDAI baseline mean±SD	3.3±1.7	4.5±1.1	0.003
BASDAI last visit mean±SD	3.0±1.6	4.0±1.9	0.001
ASDAS-CRP Baseline mean±SD	2.9±1.2	3.2±0.9	0.358
ASDAS-CRP last visit mean±SD	2.6±1.04	2.7±0.9	0.596
Adaptation to treatment as per ASAS recommendations	157 (81.3)	33 (71.7)	0.254
NSAIDs use n (%)	128 (65.6)	35 (72.9)	0.067
Use of biologics and tsDMARDs n (%)	98 (46.0)	11 (22.0)	0.002
ASDAS-CRP remission/LDA n (%)	65 (38.9)	9 (25.0)	0.115

Conclusion: This study has highlighted that the burden of disease in women is higher than in men in terms of BASDAI and comparable by

ASDAS-CRP. However, despite this, there is a disparity in terms use of biologics and tsDMARDs in females. There is an unmet need to address factors including issues of access for more vulnerable gender especially in low and middle-income countries where generally there is no coverage for outpatient rheumatic diseases.

P796
THE BURDEN OF SEPSIS IN OSTEOPOROTIC PELVIC FRACTURE PATIENTS: A NATIONWIDE COHORT STUDY IN AUSTRIA, 2010–2018

M. Behanova[1], A. Sokhan[2], J. Haschka[1], B. Reichardt[3], J. Zwerina[1], R. Kocijan[2]

[1]Ludwig Boltzmann Institute of Osteology at Hanusch Hospital of OEGK and AUVA Trauma Centre Meidling, Vienna, [2]Ludwig Boltzmann Institute of Osteology at Hanusch Hospital of OEGK and AUVA Trauma Centre Meidling, Vienna, [3]Austrian Social Health Insurance Fund, Österreichische Gesundheitskasse, Eisenstadt, Austria

Objective: Pelvic fractures (PF) are now considered osteoporotic fractures, associated with a notably high mortality rate. Elderly individuals are more susceptible to infectious diseases and display a worse prognosis attributed to the decrease in immune responses. The aim of this study was to determine the epidemiological characteristics and impact of sepsis on one-year mortality in the Austrian population of patients with PF aged $\geq$ 50 y, within the time frame 2010–2018.
Methods: We performed a retrospective nationwide register-based cohort study which included all in-hospital patients aged $\geq$ 50 with PF between 2010–2018 in Austria. We identified patients who were hospitalized with sepsis within 180 d following a PF event. Cumulative incidence of sepsis (CIF) was estimated in the context of considering mortality as a competing risk. For assessing differences in CIF by sex and age group we applied Fine and Gray risk analysis. Association between sepsis and all-cause mortality (between septic and non-septic patients), was assessed by time-varying Cox proportional hazard regression.
Results: Among 59,081 patients hospitalized with PF between 2010–2018 we identified 619 (1.05%) patients who were hospitalized with sepsis within 180 d following PF. The cumulative incidence risk of sepsis within 180 d after PF was significantly higher in males (1.4%, 95%CI 1.2%-1.5%) as compared to females (0.92%, 95%CI 0.83%-1.0%), $p < 0.001$. There were no significant differences in CIF by age group. In the cohort of patients with sepsis, the one-year mortality was 50.4%. Mortality risk was greater for patients who developed sepsis, independently of age, sex and comorbidity status (HR 3.12, 95%CI 2.83–3.44, $p < 0.001$) as compared to patients without sepsis.
Conclusion: With a very high one-year mortality risk among those who develop sepsis, our study emphasizes the substantial impact of sepsis on long term survival in fractured patients. These findings underscore the critical need for sepsis prevention and early detection and management to mitigate its detrimental effects on patient outcomes.

P797
MUSCULOSKELETAL SARCOIDOSIS WITH EXCEPTIONAL PRESENTATION

M. Slouma[1], M. Ben Messaoud[1], R. Dhahri[1], I. Gharsallah[1]

[1]Military Hospital of Tunis, Tunis, Tunisia

Sarcoidosis is a multisystem inflammatory disease that can affect various organs in the body, most commonly the lungs and lymph nodes. It is characterized by the formation of granulomas, which are clumps of inflammatory cells. The exact cause of sarcoidosis is unknown, and it can present with a wide range of symptoms. The osteoarticular involvement in sarcoidosis is rare. This report seeks to present an uncommon case of osteoarticular sarcoidosis with distinctive clinical manifestations and highlight the importance of detecting osteoarticular involvement in this disease.
Case report: A 37-year-old woman with no medical history was referred to our department with a five-year history of a painless lump affecting her left wrist, which gradually increased in size. A few months prior to our consultation, she also noticed a new mass on her right wrist and swelling of the nasal dorsum. Upon presentation, her main concerns were the recurring swelling at the base of her nose, increased size of the wrist masses, and the appearance of new lesions on the left forefoot and hindfoot (lateral retro-malleolar). She reported recent unquantified weight loss and had no other notable symptoms, such as fever, anorexia, night sweats, or history of bone/joint pain. Physical examination revealed non-tender swelling on the dorsal part of the right hand, lateral side of the left wrist, and a fusiform mass on the lateral dorsal side of the left foot. Nasal dorsal lump and palatal ulcerations evolving for one month were also noted. Joint, chest, abdomen, cardiovascular system, and skin examination showed no significant abnormalities. Routine blood tests including full blood count, inflammatory markers, bone profile, renal and liver function tests were normal despite a lymphopenia (lymphocyte level: 800/mm^3, N: 1500–4000/mm^3). Angiotensin converting enzyme assay was not performed. Rheumatoid factor and anti-cyclic citrullinated peptide antibodies (sensitive and specific diagnostic markers for rheumatoid arthritis) were negative. Antinuclear antibodies and anti-neutrophil cytoplasm antibodies were also negative. Complement (C3 and C4) was within the normal range. A tuberculin skin test was performed and revealed an anergy. The Interferon-Gamma Release Assays (IGRAs) were negative. The Treponema Pallidum Hemagglutinations Assay (TPHA) and Venereal Disease Research Laboratory (VDRL) were negative. The polymerase chain reaction (PCR) M. tuberculosis complex on both skin and synovial sheath was negative. The X-rays of hands and feet did not show any geodes or erosions. The chest radiography did not show any abnormalities. The chest CT scan revealed adenomegalia above and below the diaphragm, some of which were necrotic. There were no other scannographic signs of tuberculosis. MRI showed a mass on the dorsal surface of the right hand, centred on the tendon sheath of the 4th, 5th and 6th extensor compartments, with regular lobulated contours and local T1 hyposignal, heterogeneous T2 hyposignal with areas of hypersignal and intense enhancement after injection of Gadolinium. The mass measured 58 $\times$ 31 mm and was associated with synovitis of the 3rd, 4th and 5th metacarpophalangeal joints. It also revealed a second mass on the ulnar border of the left wrist centred on the 6th extensor compartment, with the same features as the previously described mass and with haemopigmented deposits in T2* hyposignal. It measured 53*26 mm and was associated with tenosynovitis of the 5th homolateral extensor compartment and synovitis of the distal radio-ulnar. This mass was responsible for cortical lysis opposite and extending to the ulnar styloid. The MRI findings were strongly suggestive of villonodular tenosynovitis of the extensor tendons of the hands. She had two nodules removed from the nasal dorsum, and the biopsy revealed a gigantocellular granuloma, sometimes centred on caseous necrosis, suggestive of tuberculosis. The patient had not received anti-tubercular treatment. Biopsy of the tumour of the nasal dorsum was repeated one year later when the nasal mass recurred. Histopathological examination revealed a recurrence of tuberculoid granulomatosis of the nasal dorsum, with no histological signs of malignancy. Biopsy of the synovial sheath revealed epithelioid and giganto-cellular granulomas with no obvious caseous necrosis. Accessory salivary gland biopsy showed grade 1 focal lymphocytic sialadenitis according to the classification defined

by Chisholm and Mason. There were no granulomas or amyloid deposits. She was diagnosed with pulmonary sarcoidosis based on clinical symptoms, radiological findings, and histopathological evidence of non-caseous granulomas. Long-term treatment was initiated with methotrexate 15 mg weekly. The patient received oral corticosteroids (prednisolone 0.5 mg/kg daily) and within 18 months, steroids were gradually reduced until 2.5 mg/d. There was a good response with a significant reduction of the masses on both wrists. After 2 y of follow-up, she remained stable and had no recurrence of symptoms. She is still on long-term management and monitoring to assess any potential relapses.

Conclusion: The case illustrated showcases the distinctive clinical and radiological features associated with osteoarticular sarcoidosis. Identifying osteoarticular involvement in sarcoidosis can assist clinicians in making an accurate diagnosis and initiating appropriate therapy, thereby averting potential associated morbidities.

P798
ATTITUDE OF TUNISIAN RHEUMATOLOGISTS TOWARD THE DESIRE FOR PREGNANCY IN PATIENTS WITH SPONDYLOARTHRITIS FROM CONCEPTION TO POSTPARTUM

M. Slouma[1], M. Ben Messaoud[1], R. Dhahri[1], I. Gharsallah[1]

[1]Military Hospital of Tunis, Tunis, Tunisia

Objective: Spondyloarthritis (SpA) can affect women in their reproductive years. Managing them during pregnancy can pose a significant therapeutic challenge for rheumatologists. The objective of our study was to assess the attitude of Tunisian rheumatologists toward the desire for pregnancy in patients with SpA.

Methods: A cross-sectional survey was conducted among Tunisian rheumatologists through an anonymous questionnaire distributed on social media using the Google Forms platform. The questionnaire consisted of 27 items addressing the attitudes adopted regarding the desire for pregnancy in SpA patients.

Results: In total, 40 rheumatologists (39 women and 1 man) participated in the survey within the specified timeframe. The average age was 29.8 y [26–48 y], with 90% currently in training. The average years of professional experience were 4.4 y [1–21 y]. 10% of physicians claimed to have previously attended a workshop on pregnancy in SpA. Before initiating treatment, reproductive-age patients were questioned about a potential desire for pregnancy in 35% of cases for NSAIDs and 100% of cases for disease-modifying antirheumatic drugs (DMARDs). Twenty percent of rheumatologists checked for effective contraception use before starting NSAID treatment vs. 90% for DMARDs. During disease follow-up, 30% of physicians inquire about the desire for pregnancy in patients treated with NSAIDs, as opposed to 90% for DMARDs. Effective contraception during treatment is monitored in 10% for NSAIDs and 85% for DMARDs. The majority of participants (95%) assessed the severity of the disease before allowing pregnancy. Half of the physicians permit pregnancy for at least a moderate level of disease activity. 75% of participants would schedule a preconceptional consultation. 65% of rheumatologists discuss treatment in consultation with the gynecologist. Regarding treatment, 65% of participants believe that if disease activity allows, NSAIDs should be discontinued before conception. If not, permitted NSAIDs were mainly arylcarboxylic acids (50%) and selective COX-2 inhibitors (37%). Their prescription was allowed until the second trimester of pregnancy in 67.5% of cases. Feared adverse effects were premature closure of the ductus arteriosus (90%), oligohydramnios (30%), spontaneous abortions (25%), newborn renal failure (15%), and prolonged bleeding time for mother and child (10%). The recommended DMARDs in pregnant women were mainly certolizumab (88%), etanercept (22%), and sulfasalazine (6%) for both active axial and peripheral forms. In the event of pregnancy occurring under anti-TNF, rheumatologists indicate a reassessment of the benefit/risk balance of treatment (80%), ultrasound monitoring (75%), and reporting to pharmacovigilance (60%) while reassuring the couple. Background treatments prescribed during breastfeeding were mostly certolizumab (75%), sulfasalazine (55%), and celecoxib (46%).

Conclusion: The majority of Tunisian rheumatologists follow current guidelines for the management of SpA in cases of a desire for pregnancy. The management of these patients requires more targeted training and awareness.

P799
ATTITUDE OF TUNISIAN RHEUMATOLOGISTS TOWARDS THE IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE IN THE FIELD OF RHEUMATOLOGY

M. Slouma[1], M. Ben Messaoud[1], R. Dhahri[1], I. Gharsallah[1]

[1]Military Hospital of Tunis, Tunis, Tunisia

Objective: Artificial intelligence (AI) plays a crucial role in the era of the medical revolution, and the field of rheumatology is no exception. The spectrum of rheumatic diseases can be challenging to diagnose and treat due to the complexity of their symptoms. AI has the potential to enhance the accuracy of diagnosis and treatment management through automated algorithms. The objective of our study was to assess the willingness of Tunisian rheumatologists to embrace the application of AI in the field of rheumatology.

Methods: A cross-sectional survey was conducted among Tunisian rheumatologists through an anonymous questionnaire distributed on social media using the Google Forms platform. The French version consisted of 22 questions exploring the rheumatologists' perspectives towards the implementation of AI in the field of rheumatology.

Results: In total, 42 rheumatologists (40 women and 2 men) participated in the survey within the specified timeframe. The average age was 30.4 y [26–48 y], with 95% currently in training. The average years of professional experience were 3.8 y [1–21 y]. 28% of rheumatologists reported having used AI at least once in their daily practice, with a low frequency. Regarding potential applications of AI, rheumatologists believed that this technology could significantly impact patient management in the following areas: interpretation of radiological (58%) and laboratory (47%) investigations, confirmation of a positive diagnosis (32%), assessment of disease prognosis (32%), and therapeutic management (21%). Evaluation of rheumatologists' adherence to AI showed that 8% of participants had used this tool to make a positive diagnosis. The response was considered relevant in 33% of cases. None of the physicians had used AI to interpret radiological or laboratory investigations. In the research domain, 29% of rheumatologists had employed AI in scientific work, with a 56% satisfaction rate. Participants were also questioned about their perception of AI. 57% of physicians believed that AI could enhance the accuracy of medical diagnoses in the field of rheumatology. Nearly 40% of respondents were concerned that this technology might replace the patient-doctor relationship and impact equality in access to quality healthcare. In 57% of cases, rheumatologists thought that AI could harm patient wellbeing and that it might lead to biases, skill loss, and a shift of responsibility in 66% of cases. 62% of participants believed that AI would have consequences for patients' privacy. On the ethical aspect, half of the rheumatologists (52%) affirmed that AI does not undermine the fundamental values of medicine.

Conclusion: AI is a rapidly advancing field. However, its integration into the field of rheumatology in Tunisia is not yet well established.

P800
IMPACT OF FLOSSING METHOD ON THE FUNCTION OF THE JOINT IN PEOPLE AFTER KNEE INJURIES

M. Berwecka[1], B. Latała[1], A. Berwecki[2], M. Warzecha[1], A. Spannbauer[1], P. Dobosz[3]

[1]Uniwersytet Jagielloński—Collegium Medicum, Instytut Fizjoterapii, [2]Akademia Wychowania Fizycznego w Krakowie, Instytut Nauk Stosowanych, [3]Akademia Wychowania Fizycznego, Kraków, Poland

Objective: Knee injuries are common and cause extensive damage to structures surrounding the joint, such as ligaments, menisci and joint capsule. Patients require physiotherapy to improve joint function. The most common problem after an injury is the limited range of motion. One of the methods used in therapy is tissue flossing. The therapy combines compression, followed by active movement. The aim of the study was to assess the impact of the Flossing therapy on the function of the knee joint after an injury.

Methods: The study group included 40 participants (25 women and 15 men), aged 18–40, after knee injuries. The subjects completed the questionnaire that included information about circumstances of the injury. Measurements were made: range of motion using a standard Baseline 365° goniometer, muscle strength (hamstrings and quadriceps femoris) using a MicroFET2 dynamometer, functional mobility with deep squat test from the Functional Movement Screen (FMS) and pain with Numeric Rating Scale. Subsequently, participants were subjected to therapy using floss band tapes. The tape was applied around the joint bypassing the patella for 2 min with a tension of approximately 80%. Then, 3 exercises were performed with full existing range of motion: active flexion and extension in supine, deep squat and straight kneeling to sitting on heels. After removing the tape, measurements were taken again.

Results: A statistically significant increase in the range of active and passive flexion, improvement in quadriceps muscle strength and mobility, and a decrease in pain were found. A negative correlation was found between the period since the injury and the change in the range of extension in the knee joint.

Conclusion: Floss band therapy increases the range of active and passive flexion and mobility, improves the strength of the quadriceps muscle, and reduces the level of pain in people after knee joint injuries. Flossing does not affect the range of extension in the knee or the strength of the biceps femoris muscle. The effectiveness of therapy decreases as the time since the injury increases.

P801
TOPICAL DELIVERY OF ACECLOFENAC BY NOVEL NANOSTRUCTURED CARRIER FOR EFFECTIVE MANAGEMENT OF RHEUMATOID ARTHRITIS

M. Bhargava[1], S. Bhargava[2]

[1]GTB Hospital, [2]Signa College of Pharmacy, Kanpur, India

Objective: Rheumatism is any painful disorder of the supporting body bone, ligaments, tendons or muscles, i.e., not caused by infections or injury. The primary aim of treatment of rheumatic disease is reduction of pain and inflammation, maintenance of joint mobility and prevention of deformity. The aim of the study was to develop and characterize aceclofenac loaded solid lipid nanoparticles (SLN) and nanostructure lipid carriers (NLC)to study the skin permeation profile and deposition kinetics.

Methods: The SLN/NLC were prepared using glyceryl monostearate (GMS) by ultrasonication method and optimized. The in vitro characterization parameters included optical microscopy, particle size, shape, polydispersity, zeta potential and surface morphology, differential scanning calorimetry, X-ray diffraction and Entrapment efficiency. The in vivo studies included carrageenan induced paw edema method and CLSM studies.

Results: Compared to SLN, NLC showed improved drug loading capacity and a good ability to reduce the drug expulsion during storage. The data indicates prolonged and higher magnitude of edema inhibition exerted by SLN than NLC formulations. GMS based SLN or NLC hydrogel can be proposed for topical use for providing sustained effect to inflammatory disease like arthritis and ankylosing spondylits.

Conclusion: SLN or NLC based hydrogel of anti-inflammatory agent could be designed for treatment of rheumatic diseases. Permeation studies through human cadaver skin and clinical implication of data are required to develop topical drug delivery system. Nevertheless, further specialized studies are required to confirm the present hypothesis and to better investigate the role of nanoparticulate carriers for controlling and sustaining the release of the drug.

P802
DENDRITIC NANOARCHITECTURES FOR THE TREATMENT OF PSORIASIS

M. Bhargava[1], S. Bhargava[2]

[1]GTB Hospital, [2]Signa College of Pharmacy, Kanpur, India

Objective: Psoriasis is a multigenic, cutaneous inflammatory disorder, involving a variety of pathological changes in skin. The study aimed to evaluate the potential of dendrimers for safe and efficient topical delivery of antipsoriatic agent Dithranol, one of the most promising anti-psoriatic agents via topical route whose application is inconvenient and troublesome.

Methods: The polypropylene Imine dendrimers (PPID) were synthesized by divergent synthesis method. The ethylene diamine was used as core material and acrylonitrile to form branching units. Dendrimers were then characterized by IR & NMR spectroscopy and transmission electron microscopy. Dithranol loaded PPID were evaluated for in vitro drug release, haemolytic toxicity, skin irritation, tape stripping studies and drug penetration studies.

Results: Loading of dithranol was found to be pH dependent. PPID showed significantly enhanced permeation rate constant and lesser skin irritation when compared with the plain drug solution. Skin separation studies and confocal laser scanning microscope images showed that the dye-loaded dendrimers exhibits deposition of dye in pilosebaceous compartment. The entrapment of drug in dendritic system reduced skin irritation, haemolytic toxicity, enhanced permeation rate constant and penetration and accumulation in the skin. The dithranol loaded dendrimers extended drug retention time in the skin *vis-a-vis* reducing the associated disadvantages and improving the topical bioavailability of the molecules in a controlled pattern.

Conclusion: The enhanced accumulation of drug via dendrimer carrier within the skin might help optimize targeting of this drug to the epidermal and dermal sites, thus creating new opportunities for well-controlled, modern topical application of Dithranol for the treatment of psoriasis.

P803
WHAT IS THE BEST SF36 OR LUPUSQOL?

M. Bizhanova[1], E. Aseeva[2], S. Solovyev[2], S. Glukhova[2], B. Issayeva[1], S. Issayeva[1], M. Saparbayeva[1], A. Amanzholova[1]

[1]Asfendiyarov Kazakh National Medical Univ., Almaty, Kazakhstan, [2]Rheumatology, Federal State Research Institution (FSRI) named after V. A. Nasonova, Moscow, Russia

Objective: The LupusQoL is a disease-specific health-related quality of life (HRQoL) measure for patients with lupus. We conducted this study to compare the efficiency of LupusQoL with the 36-item Short-Form Health Survey (SF-36), a generic quality of life (QoL) scale, in patients with lupus. Both questionnaires were conducted for one visit to the clinic.

Methods: Disease activity was evaluated by the SLEDAI-2 K, and chronic damage by the Systemic Lupus International Collaborating Clinics Damage Index score (SDI). Associations between the LupusQoL and SF-36 domains were examined, while also examining age, disease duration, and disease activity for each questionnaire. Descriptive statistics, Spearman's correlation coefficients, and Students t-test were performed to analyze the data.

Results: A total of 400 patients with lupus (F/M 363:37, mean age 34,2 ± 11.5 y, mean disease duration 106,3 ± 91,9.0 months) were included, and 63% of these were active and 56% of these had SDI ≥ 1. The mean SLEDAI 2 K score was 9,6 ± 8,0. QOL as assessed by SF-36 and LupusQoL was low in this group of patients with SLE. The mean scores for each of the domains of the LupusQoL and SF-36 are shown in Table 1. The mean scores are < 60 in 8 domains of the SF-36 but not in social functioning (62,03 ± 27,19) and physical function (62,35 ± 28,53).

Table 1. Descriptive statistics and correlation coefficient for SF-36 and LupusQoL

LupusQoL domains	Mean (SD)	SF-36 domains	Mean (SD)	r	P
Comparable					
Physical health	66,20±23,18	PF	62,35±28,53	0,77	0,96
Emotional health	64,65±24,75	MH	50,51±8,40	0,38	0,94
Pain	70,03±24,68	BP	47,0±8,86	-0,33	0,02
Fatigue	62,7±24,73	VT	53,04±22,59	-0,70	0,83
Noncomparable					
Planning	63,90±28,46	SF	62,03±27,19		
Intimate relationships	72,92±30,93	GH	49,14±20,51		
Burden to others	50,68±27,79	RE	49,84±43,86		
Body image	65,18±27,60	RP	40,46±41,35		
		PCS	45,15±7,65		
		MCS	48,46±5,41		

The MCS and PCS scores were both < 50. Despite the fact that the mean score in LupusQoL was always higher than in SF-36 for each of the comparable domains, 3 standardized p values were not statistically significant (mean score in 400 patient visits: physical health/physical function, 66,20 ± 23,18/62,35 ± 28,53, p = 0.96; emotional health/mental health, 64,65 ± 24,75/50,51 ± 8,40, p = 0.94; and fatigue/vitality 62.70 ± 24.73/53.04 ± 22.59, p = 0.83), 1 standardized p value was statistically significant—pain/bodily pain 70.03 ± 24.68/47.00 ± 8.86, p = 0.02. The correlation of the comparable domains of LupusQoL and SF-36 was studied. There was a strong correlation between comparable domains in LupusQoL and SF-36 in 400 patient visits (physical health and physical functioning, r = 0.77; emotional health and role emotional, r = 0.38; pain and bodily pain, r = -0,33; and fatigue and vitality, r =—0.70; all p values < 0.0001). For the 4 noncomparable domains of the LupusQoL, there was a correlation between 3 domains of LupusQoL and 1 of the component scores of SF-36: body image and SF-36 MCS, r = 0.20; planning and SF-36 MCS, r = 0.13, r = 0.73; and burden to others and SF-36 MCS, r = 0.19; body image and SF-36 PCS,r = 0,38; planning and SF-36 PCS,r = 0,66; and burden to others and SF-36 PCS,r = 0,38.

Conclusion: The LupusQoL-Russian is sensitive to change in SLE patients with active SLE. LupusQoL and SF-36 were equivalent in assessing the HRQOL in the Russian SLE patients. Both LupusQoL and SF-36 are easily completed by patients and correlate very well with each other.

P804
PROGRAMMING COST ACTION 21122: IMPLICATIONS FOR THE PROMOTION OF AWARENESS ABOUT MUSCULOSKELETAL HEALTH AMONGST NON-GERIATRICIANS

M. Bonnici[1], S. Cotobal Rodeles[2], S. Duque[3], F. Kamberi[4], K. Piotrowicz[5], A. Wissendorff Ekdahl[6], G. Ogliari[7], M. Kotsani[8]

[1]Karin Grech Rehabilitation Hospital & St Vincent De Paul Residence, Pieta & Luqa, Malta, [2]Hospital Universitario Savero Ochoa Leganés, Madrid, Spain, [3]Faculty of Medicine, Univ. of Lisbon, Lisbon, Portugal, [4]Scientific Research Centre for Public Health, Faculty of Health, Univ. of Vlore "Ismail Qemali", Vlorë, Albania, [5]Jgiellonian Univ. Medical College, Kraków, Poland, [6]Dept. of Geriatric Medicine, Helsinborg Hospital and Institution of Clinical Science, Lunds Univ., Lund, Sweden, [7]Health Care for Older People (HCOP), Queen's Medical Centre, Nottingham Univ. Hospitals NHS Trust, Nottingham, UK, [8]Hellenic Society for the Study and Research of Aging, Greece, Greece

Objective: Aging entails a progressive decline in muscle mass, function and bone density, recognized as osteosarcopenia. Adverse outcomes like falls, fragility fractures, and increased mortality are associated with osteosarcopenia in older adults. Programming-CA-21122 strives to propose tailored education and training in geriatric medicine (GM) for healthcare professionals (HCP). The primary objective is to promote GM in countries where it is still emerging, acknowledging also the significance of musculoskeletal health in older adults.

Methods: Engaging 319 researchers from 43 countries, Programming-CA-21122 will last for 4 y. It utilizes online international surveys and focus groups during national events to systematically assess educational needs of medical doctors, HCP, end-year medical students and health structures managers (Working Group-WG1). A number a geriatric conditions (including frailty, falls and mobility, bone health and osteoporosis, orthogeriatrics, sarcopenia and nutritional assessment) are included in the questioning investigating the perceived level of current knowledge, relevance for the clinical practice of the responder and their interest in being trained on each of these conditions. Based on the collected data, WGs 2,3 and 4 will reach to a consensus on the recommended content and didactic methods of educational activities on basic principles of GM for non-geriatricians, spanning ambulatory, home care, acute/subacute, and long-term care settings. WG5 focuses on dissemination and impact maximization activities and on the expansion of the network.

Results: The expected results of Programming-CA-21122 are to identify a pragmatic set of possibilities for continuous professional education on basic geriatric skills, including musculoskeletal health of older adults. This initiative aspires to further instigate change at each national level, promoting the integration of GM principles into the attitudes and practices of HCP.

Conclusion: Emphasizing musculoskeletal health, it is crucial to build biological and maintain robustness throughout life and into old age. Recognizing nutrition and physical exercise as pivotal environmental factors influencing musculoskeletal health, strategies involving falls prevention methods, nutrition, and physical exercise

are essential. In regions where GM is still emerging, the introduction of an educational curriculum becomes paramount.

P805
X-LINKED FAMILY HYPOPHOSPHATEMIC RICKETS (XLH): EXPERIENCE IN ADULTS IN ARGENTINA

M. C. Balonga[1], A. C. Cantó[1], E. Giacoia[1]

[1]Centro Médico Morón, Buenos Aires, Argentina

Objective: XLH is a genetic disease characterized by rickets and osteomalacia and caused by pathogenic variants in PHEX (which encodes phosphate-regulating neutral endopeptidase PHEX)[1]. The incidence is 3.9 cases per 100,000 live births and the prevalence is 4.8 per 100,000 adults[2] and is included in the classification of "rare" diseases. Numerous genotypic variants and a great variety in phenotypic expression have been described, making it essential to control and monitor patients by doctors specializing in the disease. We aimed to describe the clinical, biochemical characteristics and complications associated with chronic disease in patients diagnosed with XLH referred to a specialized center in Argentina.
Methods: Descriptive, cross-sectional study. The medical records of 10 patients evaluated from January to December 2023 were analyzed. The clinical findings of the physical examination were evaluated and complementary studies were requested in search of the typical manifestations and complications of the disease.
Results: Tables 1 and Graph 1 summarize the findings of each patient analyzed.

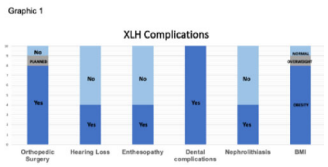
Table 1

Patient	Age (y)	Gender	Job	Height (Cm)	Weight (Kg)	Family history	Treatment
1	28	F	Yes	145	69.3	Yes	Conventional*[1]
2	44	F	Yes	138	59.0	Yes	Burosumab[2]
3	24	F	Yes	133	67.2	Yes	Conventional*[1]
4	40	F	No	144	87.0	Yes	Conventional*
5	41	F	No	154	54.0	Yes	Conventional*
6	47	F	Yes	143	67.0	No	Burosumab[2]
7	33	F	No	142	54.5	No	Conventional*
8	51	F	Yes	145	73.0	No	Burosumab[2]
9	46	M	Yes	130	70.4	Yes	Burosumab[2]
10	43	F	No	135	97.0	Yes	Conventional*

y: Years old F: Female M: Male Cm: Centimeters Kg: Kilograms

*Oral phosphate supplements + calcitriol [1]Antibody to FGF-23 [2]Start of Burosumab expected soon

Graphic 1



Conclusion: We consider that the experience acquired through follow-up consultations of patients with rare diseases such as XLH is the best tool to advance medical knowledge and thus achieve early diagnosis, access to medical treatment and multidisciplinary teamwork for orthopedic corrections with the aim of achieving a comprehensive approach, improving the quality and survival of life of patients with the disease.
References:

1. Trombetti A, et al. Nat Rev Endocrinol 2022;18:366.
2. Haffner D, et al. Nat Rev Nephrol 2019;15:435.

P806
BENEFITS AND HARMS OF ANTIRESORPTIVE THERAPY IN MEN WITH NONMETASTATIC PROSTATE CANCER ON ANDROGEN DEPRIVATION THERAPY: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

A. B. Abu El Nasr Bassatne[1], N. K. El Meski[1], R. H. Horanieh[1], F. A. Andary[1], C. R. Rhayem[1], D. Mukherji[1], E. Akl[1], G. El Hajj Fuleihan[1], M. C. Chakhtoura[1]

[1]American Univ. of Beirut, Beirut, Lebanon

Objective: Androgen deprivation therapy (ADT) is used as an adjuvant therapy in men with prostate cancer (PCa). It is associated with bone loss and increased fractures risk, due to decreased estrogen and androgen levels. We aimed to evaluate the effects of antiresorptive therapy on bone health in men with non-metastatic PCa on ADT.
Methods: We searched 4 databases until August 3, 2023 for randomized controlled trials (RCTs) conducted in men with non-metastatic PCa on ADT receiving bisphosphonates (BP), denosumab (Dmab) or placebo/control. Our outcomes included fracture risk, changes in BMD and bone turnover markers (BTM), mortality, and adverse events rates. We performed meta-analyses by outcome and comparison using RevMan5.3. We assessed the evidence certainty using the GRADE methodology. PROSPERO registration CRD42021225502.
Results: We included 26 RCTs covering parenteral BP (N = 17), oral BP (N = 5), and denosumab (N = 2). 2 RCTs compared both oral BP and Dmab. Oral BP did not reduce fracture incidence at 12 months (95%CI [0.10, 3.23]; very low certainty). Intravenous (IV) BP did not reduce morphometric vertebral fractures at 36 months (RR = 1.06; 95%CI [0.57,1.98]; very low certainty). Other fractures captured as adverse events in most IV BP trials varied by definition and number. Dmab significantly reduced the incidence of morphometric vertebral fractures at 12, 24 and 36 months (RR = 0.15–0.38), based on one trial. Treatment with antiresorptive drugs for 12 months increased BMD at the hip and the lumbar spine and decreased markers of bone formation and resorption (very low to moderate certainty). IV BP showed a non-significant increase in mortality rate (RR = 1.5, very low certainty). Gastrointestinal side effects were the most common. Acute phase reactions were common with IV BP, while jaw osteonecrosis and hypocalcemia occurred more rarely.
Conclusion: Dmab decreases risk of morphometric vertebral fractures in men with nonmetastatic PCa receiving ADT. However, data on fracture reduction with BPs is scarce. Our analyses reveal a protective role of anti-resorptive treatment on BMD and BTMs, surrogates of fractures. These findings highlight the importance of considering antiresorptives as an imperative treatment in these patients. Future well-designed and powered RCTs are needed to assess the effect of treatment on fracture risk.

P807
SEVERE SARCOPENIA AND OSTEOPOROSIS IN A CASE WITH MEDULLARY TRANSECTION

M. Cevei[1], D. Stoicanescu[2], A. Gasparik[3], A. Gherle[1], M. S. Deac[1]

[1]Univ. of Oradea, Faculty of Medicine, Oradea, Romania, Oradea, [2]Univ. of Medicine and Pharmacy "Victor Babes", Timisoara, Romania, Timisoara, [3]Univ. of Medicine and Pharmacy of Târgu Mureş, Romania

Spinal cord injuries lead to rapid and debilitating levels of bone and muscle loss, resulting in osteoporosis and sarcopenia.
Case report: We describe a 33-year-old female patient, known with T11-T12 medullary transection from 2015, who was hospitalized in the Medical Rehabilitation Clinical Hospital Baile Felix, Romania for medical rehabilitation. Physical examination revealed paraparetic motor deficit, deficit in performing ADLs. We used the modified Ashworth scale to quantify spasticity of lower limb, scoring 0—normal muscle tone, and ASIA Impairment Scale obtaining A score—neurological level T11-T12, sensory level T12. The John Health System Corporation scale established a high risk of falling, with 21 points. The patient's self-care capacity, functional independence and functional ambulatory category were assessed using the FIM, Barthel and FAC (Functional Ambulation Classification) scale, respectively. FIM scale score was 76 out of 126, 60.13%. Barthel Index score: 45 points out of 100, indicating severe dependency. FAC score of 0 indicated that the patient was a non-functional ambulatory. BMD determined by DXA from 06.09.2023 indicated: lumbar spine Z-score: -3.2; left hip Z-score:-2.0; right hip Z-score: -2.03. ALM was

0.39 revealing severe sarcopenia. Dynamometry performed with Jamar dynamometer on 10.06.2023 indicated: right handgrip strength 16 kg and left handgrip strength 14 kg. The medical rehabilitation recommendations included: daily kinetic program, comply with recommendations related to fall prevention.
Conclusion: Motor deficit due to spinal cord injuries leads to osteoporosis and sarcopenia, which impair functional and motor abilities.

P808
ENHANCING BONE DENSITY IN ELDERLY MALES AND FEMALES WITH OSTEOPOROSIS THROUGH DIETARY INTERVENTION

M. Chauhan[1]

[1]S.M.Patel College of Home Science, Sardar Patel Univ., V.V. Nagar, Gujarat, Vallabh Vidyanagar, India

Objective: As our population ages, osteoporosis becomes a major public health issue. Functional foods, known to reduce chronic diseases like osteoporosis, were investigated for bone loss prevention. The study aimed to assess the impact of consuming functional food products on individuals at risk of osteoporosis.
Methods: Sample selection of elderly males and females of the age group 40–70 y from different cities from central Gujarat was done using a combination of purposive sampling and snow-ball technique. Based on inclusion and exclusion criteria, out of the 275 subjects, 73 subjects identified as either osteopenic or osteoporotic based on BMD (T-score) were selected for the feeding study. Ultrasound bone densitometer was used to screen for BMD. The intervention involved supplementing 50 females and 23 males with two functional food products, namely khakhra and laddu. These products, enriched with functional ingredients and high calcium sources such as malted ragi (*Eleusine coracana*), defatted soybean *(Glycine max),* sesame seeds *(Sesamum indicum L.),* Amaranth seeds *(Amaranthus cruentus)* and dehydrated drumstick leaves *(Moringa Oleifera),* provided 441.74 mg calcium and 334.96 mg phosphorus per day for a 3-month period. Blood pressure, lipid profiles, serum calcium levels, urinary calcium, phosphorous, and hydroxyproline excretions were measured, along with BMD, before and after the intervention. SPSS version 23 was used for data analysis.
Results: Following the intervention, BMD improvements were observed, with values decreasing from -1.71 to -0.94 in females, -1.90 to -0.86 in males, and -1.84 to -0.89 in the total subjects ($p < 0.01$). Significant decreases ($p < 0.01$) were noted in total cholesterol and LDL cholesterol levels. Urinary hydroxyproline, calcium excretion, and phosphorus excretion also decreased significantly ($p < 0.01$). Serum calcium levels showed a slight decrease within the normal range (9.02–9.59 mg/dl), while systolic blood pressure exhibited a significant decrease ($p < 0.01$).
Conclusion: The functional components present in the developed products effectively promoted bone mineralization, highlighting the potential of functional foods in preventing osteoporosis.
Acknowledgement: Anand Orthopaedic Hospital, Nadiad, Gujarat, India for providing valuable insights in the success of this research.

P809
PREDICTIVE FACTORS OF ATLANTOAXIAL SUBLUXATIONS IN RHEUMATOID ARTHRITIS

M. Dhifallah[1], S. Rahmouni[1], M. Abbes[1], K. Zouaoui[1], S. Boussaid[1], H. Sahli[1], S. Rekik[1], M. Elleuch[1]

[1]Rheumatology Dept., La Rabta, Tunis, Tunisia

Objective: Atlantoaxial subluxation (AAS) is the most common cervical abnormality in rheumatoid arthritis (RA) [1]. Since AAS is often asymptomatic, it is important to determine its predictive factors in order to identify a group of patients at risk that need closer monitoring. We aimed to identify the predictive factor of SAA in RA patients.
Methods: We included patients with RA according to the ACR criteria. Sociodemographic data, clinical presentation, and radiological features were collected. The diagnosis of AAS was based on standard radiographs and/or on MRI. We assessed disease activity by Disease Activity Score 28 (DAS28), functional impairment by The Health Assessment Questionnaire (HAQ) and the structural damage by The modified Sharp/van der Heijde score (SHARPm).
Results: We collected data from 53 patients (7 males and 46 females). The mean age was 56 ± 11.24 y. The mean disease duration was 10.18 ± 8.14 y. 21 patients (39.6%) had joint deformities. 29 patients (54.7%) presented with extra-articular manifestations (EAM): 16 rheumatoid nodules (30%),15 ocular involvement (28%), 10 lung involvement (19%), 2 renal amyloidosis (4%), and one vasculitis (2%). Respective mean C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) were 19.95 ± 23.7 mg/l and 31.75 ± 23.38 mm/h. Mean $DAS28_{CRP}$, HAQ index and SHARPm score were: 5.37 ± 1.42, 1.63 ± 0.71, and 126 ± 94, respectively. AAS was diagnosed in 25 patients (47.1%): 20 anterior AAS (37.7%), 6 vertical AAS (11.3%), 3 lateral AAS (5.7%), 4 posterior AAS (7.5%) and 4 rotatory AAS (7.5%). Patients with AAS had longer disease duration (13.88 ± 9.3 vs. 6.89 ± 5.19 y, $p = 0.001$), higher HAQ index (1.9 ± 0.6 vs. 1.4 ± 0.72, $p = 0.009$), higher ESR (41.6 ± 26.2 vs. 23 ± 16.5 mm/h, $p = 0.003$), and higher SHARPm score (181 ± 98.2 vs. 77.3 ± 56.8, $p = 0.00$). AAS was associated with EAM (OR = 5.7, $p = 0.003$) and articular deformity (OR = 3.8, $p = 0.02$). No association was found between AAS and age ($p = 0.22$), sex ($p = 0.56$), CRP ($p = 0.083$) and $DAS28_{crp}$ ($p = 0.09$).
Conclusion: Our study showed that long disease duration, EAM, severe functional impairment, high ESR, and advanced structural damage are predictive of cervical involvement and SAA. Thus, SAA should be screened using radiographs and MRI in RA patients with such characteristics, even when asymptomatic.
Reference: (1) Ito H, et al. Eur Spine J 2009;18:869.

P810
OSTEOARTICULAR INVOLVEMENT IN MULTIPLE MYELOMA: PREVALENCE AND RISK FACTORS

M. Dhifallah[1], A. Feki[1], S. Ben Jemaa[1], M. Ezzeddine[1], M. H. Kallel[1], H. Fourati[1], R. Akrout[1], S. Baklouti[1]

[1]Rheumatology Dept., CHU Hedi Chaker, Sfax, Tunisia

Objective: Osteoarticular (OA) involvement represents the most common extra-hematologic manifestation of multiple myeloma

(MM). This study aims to describe the OA manifestations during MM and identify its risk factors.

Methods: We conducted a retrospective study including 126 multiple myeloma cases treated in our department over a 30-y period (1993–2023). Sociodemographic, clinical, and biological data were gathered. OA involvement was assessed through radiographic and/or MRI data.

Results: The study included 126 patients with a mean age of 65.23 ± 11.63 y [36–92], comprising 65 males and 61 females. Bone pain was present in 92.1% (n = 116) with an average duration of 4 months. Mean erythrocyte sedimentation rate and C-reactive protein levels were 99.08 mm [3–190] and 27.74 mg/l [0–196], respectively. Hemoglobin was below 10 g/dl in 51.2% of cases, averaging 9.902 ± 2.22 g/dl [5–13.9]. Calcium levels exceeded 2.75 mmol/l in 20% of cases, averaging 2.49 ± 0.33 mmol/l. Mean creatinine level was 88.28 µmol/l [36–587]. Plasmocyte rates, observed in sternal puncture or bone marrow biopsy, averaged 43.93% [5–80], with 31.7% exceeding 60%. Radiological osteolysis was found in 76.2% (n = 96) of patients, with multiple lesions in 91 cases. Commonly affected bones were the skull (37.12%), pelvis (16.8%), and spine (12%). Diffuse osteosclerosis was identified in only two patients. Pathological fractures were present in 59.5% (n = 75), including 15 peripheral fractures and 70 vertebral fractures, with 43.2% affecting the lumbar region (n = 54) and 36.8% the dorsal region (n = 46). Durie and Salmon prognostic classification distributed patients as follows: stage IA (3.2%), stage IIA (4%), stage IIB (0.8%), stage IIIA (72.2%), and stage IIIB (18.3%). Plasmocyte rates in bone marrow were significantly higher in patients with multiple osteolytic lesions (36.4 vs. 52.32%, p = 0.016). Male gender was associated with higher onset of bone pain (OR = 9.643, 95%CI [1.183–78.57], p = 0.017). Stage III of the Durie and Salmon classification was associated with radiological osteolysis (χ^2 = 5.703, p = 0.05).

Conclusion: Articular involvement in multiple myeloma is polymorphic, ranging from bone pain to multiple pathological fractures. Evaluation of prognostic markers, such as plasmocyte rates and the Durie and Salmon prognostic classification, helps identify patients at risk of developing osteoarticular complications.

P811
PHYSICAL ACTIVITY AMONG MEDICAL STUDENTS: ACTIVE BODIES, HEALTHIER MINDS

M. Dhifallah[1], H. Bettaieb[1], M. Boudokhane[1], M. H. Douggui[1], S. Bellakhal[1]

[1]Dept. of internal medicine, Internal Security Forces Hospital, La Marsa, Tunis, Tunisia

Objective: Physical inactivity and sedentary behavior represent a significant health concerns, especially among young adults [1]. The aim of the study is to assess physical activity (PA) among medical students.

Methods: We conducted a cross-sectional descriptive study among preclinical and clinical students. Participants were invited to answer an anonymous web-based questionnaire. Demographic features, BMI (kg/m^2) and physical activity (PA) were assessed. Regular PA was defined as the practice of exercise routines or sports. The data were analyzed with descriptive statistics using the SPSS statistical package.

Results: A total of 278 participants (172 preclinical and 106 clinical students) responded to the questionnaire with a mean age of 23.7 ± 2.6 [18–32] y. The sex ratio (F/M) was 3.34. Mean BMI was 23 ± 3.8 [16.1–41.4] kg/m^2. Overweight and obesity were noted in 5.2% (n = 13) and 19.6% (n = 49) of cases, respectively. Mean sitting hours was 7.9 ± 2.8 [0.3–16]. Overall 47.1% (n = 131) of students had regular PA. Individual sports were reported by 16.5% of participants: Gymnastics (n = 9), combat sport (n = 7), running (n = 5), Tennis (n = 5), professional dancing (n = 5), swimming (n = 5), aerobics (n = 5), cycling (n = 4) and kayaking (n = 1). Team sports were found in 5.7% of students: basketball (n = 4), football (n = 4), volleyball (n = 4) and handball (n = 4). Physical exercise routines were respectively: weightlifting (n = 55), walking (n = 9), Pilates (n = 3) and yoga (n = 2). Predictive factors of PA were clinical studies (OR = 3.685 95Cl [2.083–6.52], p < 10–3) and male gender (OR = 2.55 95IC [1.39–4.65], p = 0.002). Moreover, students having a regular physical activity were older (25 vs. 23.4 h, p < 10–3) and had shorter sitting hours (6.8 vs. 8.3 h, p < 10–3). In contrast, no association was noted between PA and BMI (p = 0.625).

Conclusion: Less than half of the medical students are having a regular physical activity. Considering that these individuals serve as role models for their future patients, it underscores the importance of promoting awareness about physical activity in improving overall health.

Reference: (1) Uğraş Dikmen A et al. Arch Curr Med Res 2022;3:68.

P812
VITAMIN D AND DISEASE ACTIVITY IN MALE PATIENTS WITH SPONDYLOARTHRITIS: IS THERE A LINK?

S. Rahmouni[1], M. Dhifallah[1], M. Mrad[2], K. Zouaoui[1], M. Abbes[1], S. Boussaid[1], A. Bahlous[2], S. Rekik[1], H. Sahli[1]

[1]Rheumatology Dept., La Rabta, [2]Laboratory of Biochemistry and Hormonology, Institut Pasteur de Tunis, Tunis, Tunisia

Objective: To describe the vitamin (VitD) status in male patients with spondylarthritis (SA) and to determine its correlation with disease activity.

Methods: We conducted a cross-sectional study collating 56 male patients with spondylarthritis meeting the Assessment of SpondyloArthritis international Society (ASAS) criteria. We collected sociodemographic data and disease characteristics. We measured serum VitD (25(OH)D) by microparticle immunoassay with electrochemiluminescence detection (ECLIA). We referred to the Institute of Medicine (IOM) recommendations to define VitD status thresholds as follows: deficiency (< 20 ng/ml), insufficiency (20–29 ng/ml), and adequacy (30–44 ng/ml) [1].

Results: Our study included 56 male patients with a mean age of 44.96 ± 13.35 y [19–76]. The mean disease evolution was 13.45 ± 9.87 y [0–40]. The mean weight was 80.5 ± 24.73 kg. Respective mean BASDAI, ASDAS and BASFI scores were 4.21 ± 2.24, 3.13 ± 1.19 and 4.46 ± 2.39. The mean C-reactive protein (CRP) was 18.72 ± 23.62 mg/dl [1–121]. Mean VitD serum levels was 18.82 ± 1.03 ng/ml [3.31–32.6]. Only 3 patients (14.3%) had adequate VitD levels. However, deficiency and insufficiency were observed in 32 patients (57.1%) and 21 patients (11.7%), respectively. VitD levels were negatively correlated with ASDAS (r = -0.518, p = 0.014) and CRP (r = -0.348, p = 0.032). Moreover, they were positively correlated with weight (r = 0.933, p = 0.02) and disease duration (r = 0.425, p = 0.001). However, no correlation was found between VitD and age (p = 0.604), BASDAI (p = 0.926) or BASFI (p = 0.475).

Conclusion: VitD deficiency was associated with high disease activity in patient with SA, emphasizing the importance of VitD in regulating the inflammatory response. Thus, daily VitD requirements should be adequately met and its deficiency must be routinely screened when following up patients with SA to ensure disease control.
Reference: (1) Ross AC, et al. J Clin Endocrinol Metab 2011;96:53.

P813
CLINICAL INERTIA IN POSTMENOPAUSAL OSTEOPOROSIS: IS IT THE DOCTOR, THE PATIENT OR THE HEALTHCARE SYSTEM?

K. Zouaoui[1], M. Dhifallah[1], S. Rahmouni[1], M. A. Selmene[2], M. Abbes[1], S. Boussaid[1], S. Rekik[1], H. Sahli[1], M. Elleuch[1]

[1]Rheumatology Dept., La Rabta, [2]Orthopaedic Dept., Trauma Center Ben Arous, Tunis, Tunisia

Objective: To assess clinical inertia (CI) during postmenopausal osteoporosis (PMO) among the Tunisian rheumatologists and to identify its possible causes.
Methods: A survey, self-administered via internet and elaborated via Google Forms was carried out among rheumatologists in January 2024 assessing their practice in the management of PMO.
Results: 51 rheumatologists answered our survey (46 females and 5 males) with a mean age of 32.8 ± 8.13 y [26–60]. Physicians have been practicing on average for 6.1 ± 6.22 y [1–28]. Regarding CI, 94.1% of participants defined it as the lack of adjustment or intensification of treatment, when a patient's treatment goals are not met considering recommendations and the availability of medications. 40 participants (78.4%) thought it might constitute a hindrance to the proper care of patients. It concerned the chronic diseases for 39.2% of participants. While 4 participants (7.8%) declared that scientific papers addressing the matter practically nonexistent. Nearly 73% of rheumatologists reported receiving more than five patients with PMO weekly. 39 (76.5%) doctors admitted feeling reluctant when prescribing bisphosphonates. This situation was rare in 16 cases (31.4%), occasional in 22 cases (43.1%), and frequent in 1 case (2%). Main physician-related barriers reported by participants were medication cost (86.3%), presence of comorbidities (76.5%), dentists' recommendations (27.5%), fear of side effects (21.6%), inapplicability of recommendations in clinical practice (17.6%), fear of medication interaction (17.6%), and short life expectancy (17.6%). According to the participants, patients declined the medication for the following reasons: medication cost (84.3%), low sociocultural level (68.6%), the absence of symptoms (43.1%), fear of side effects (31.4%), lack of communication patient-doctor (23.5%), illness denial (23.5%), and psychiatric illness/addiction (15.7%). Practitioners identified the following healthcare systems barriers: absence of health insurance (92.2%), the lack of referral of patients by colleagues from other specialties (62.7%), the large number of patients (47.1%), the lack of screening for PMO (41.2%), lack of time (41.2%), and absence of regular monitoring (37.3%). To mitigate the problem of CI, 90.2% participants suggested providing ongoing education and training, 78.4% insisted on team-based care approach, 66.7% highlighted the importance of targeting patients and doctors' beliefs, 56.9% emphasized the treat-to-target approach, and 11.8% spotlighted believing in doctor's intuition when addressing CI.
Conclusion: Effective measures and strategies should be implemented to combat clinical inertia in managing PMO. Therefore, all different participating parties should be targeted to ensure the best outcomes.

P814
OPTIMAL ASSESSMENT OF COGNITIVE FUNCTION TO PREDICT RECOVERY IN ACTIVITY OF DAILY LIVING AFTER HIP FRACTURES: A SHORT-TERM PROSPECTIVE SURVEY

M. Di Monaco[1], M. Sgarbanti[1], S. Trombetta[2], L. Gullone[2], A. Bonardo[2], P. Gindri[2], C. Castiglioni[1], F. Bardesono[1], E. Milano[1], G. Massazza[3]

[1]Osteoporosis Research Center, Division of Physical and Rehabilitation Medicine, Fondazione Opera San Camillo, [2]Neuropsychology Service, Fondazione Opera San Camillo, [3]Division of Physical and Rehabilitation Medicine, Dept. of Surgical Sciences, Univ. of Turin, Turin, Italy

Objective: We studied patients with subacute hip fracture defined cognitively intact or mildly impaired on the screening evaluation performed by the Short Portable Mental Status Questionnaire (SPMSQ). We hypothesized that each of 3 further cognitive tests could independently predict activities of daily living, with optimal prediction of function obtained by performing all 3 the tests.
Methods: We focused on inpatients with subacute hip fracture consecutively admitted to our rehabilitation ward. Three cognitive tests were performed on admission to rehabilitation in the patients who made ≤ 4 errors on the SPMSQ: Montreal Cognitive Assessment (MoCA), Rey Auditory Verbal Learning Test (RAVLT, immediate and delayed recall) and Frontal Assessment Battery (FAB). We assessed activities of daily living by the Barthel index. Successful rehabilitation at the end of the rehabilitation course was defined with a Barthel index score ≥ 85.
Results: Each of the 3 cognitive tests assessed before rehabilitation significantly predicted the Barthel index scores measured at the end of the rehabilitation course in our sample of 280 inpatients. However, only the MoCA score retained its significant predictive role when the scores from the 3 tests were included together as independent variables in a multiple regression model, with adjustments for a panel of potential confounders (P = 0.007). The adjusted odds ratio to achieve successful rehabilitation for a 7-point change in MoCA score was 1.98 (CI 95% from 1.02 to 3.83; P = 0.042).
Conclusion: Contrary to our hypothesis, MoCA but not RAVLT and FAB retained the prognostic role when the scores from the 3 tests were evaluated together as potential predictors of functional ability in activities of daily living. In the presence of a normal (or mildly altered) score on the SPMSQ in subacute hip fracture, MoCA scores improve prediction of activities of daily living and should be routinely performed.

P815
FEMORAL BONE MINERAL DENSITY AT THE TIME OF HIP FRACTURE IS HIGHER IN WOMEN WITH VERSUS WITHOUT OBESITY: A CROSS-SECTIONAL STUDY

M. Di Monaco[1], C. Castiglioni[1], F. Bardesono[1], M. Freiburger[1], E. Milano[1], G. Massazza[2]

[1]Osteoporosis Research Center, Division of Physical and Rehabilitation Medicine, Fondazione Opera San Camillo, [2]Division of Physical and Rehabilitation Medicine, Dept. of Surgical Sciences, Univ. of Turin, Turin, Italy

Objective: To compare femoral BMD in hip-fracture women with vs. without obesity. We hypothesized that BMD levels could be higher in the women with obesity than in the controls and we aimed to quantify the BMD discrepancy associated with the presence of obesity.

Methods: At a median of 19 d after an original hip fracture due to fragility we measured BMD by DXA at the nonfractured femur. Obesity was defined with a BMI $\geq$ 30 kg/m^2.
Results: We studied 674 women with a subacute hip fracture. BMD was significantly higher in the 55 women with obesity than in the 619 without obesity: mean T-scores (SD) were -1.88 (0.98) and -2.67 (0.92), respectively, with a mean between-group difference of 0.79 (95%CI from 0.53 to 1.05, P $<$ 0.001). Multiple adjustments did not erase the significant association between obesity and high BMD (P $<$ 0.001). A femoral BMD T-score below the threshold of -2.5 was found in 375 of the 674 women (i.e., 56%; 95%CI from 52 to 59%). Osteoporosis prevalence was significantly higher in the absence than in the presence of obesity, with χ^2 (1, n = 674) = 15.9, P $<$ 0.001. After multiple adjustments we confirmed the significant association between the absence of obesity and the presence of osteoporosis. Compared to a woman with obesity, a woman without obesity had an adjusted odds ratio of 2.7 (95%CI: 1.4–5.2, P = 0.002) for suffering from osteoporosis.
Conclusion: Hip fractures occurred at a femoral BMD higher in the women with obesity than in the controls. Because of high BMD levels that seem not to protect against hip fractures, the fracture risk may be underestimated in the presence of obesity. To avoid miscalculations of the hip-fracture risk we suggest an adjustment based on the 0.79 BMD T-score difference between women with and without obesity, although further data from robust longitudinal studies is needed to validate the BMD-based adjustment of fracture risk assessment.

P816
DIAGNOSTIC ACCURACY OF FRAX® IN PREDIALYSIS CHRONIC KIDNEY DISEASE PATIENTS

M. Diz Lopes[1], B. Fernandes[2], C. Marques Gomes[1], T. Martins Rocha[1], R. Neto[2], J. Frazão[2], L. Costa[1]

[1]Rheumatology Dept., [2]Nephrology Dept., Centro Hospitalar Universitário de São João, Porto, Portugal

Objective: FRAX predicts 10-y fracture risk. Although it is used in chronic kidney disease (CKD) patients, it can underestimate fracture risk and some adjustments may be needed. We aimed to evaluate the fracture risk and the incidence of fractures in patients with predialysis CKD and estimate the accuracy of FRAX in this population.
Methods: Retrospective study that enrolled 54 patients (40–89 years old) followed in a predialysis clinic between 2014–2023. Relevant data and information regarding clinical evident fractures was recorded from medical registries. Radiographies of the thoracic and/or lumbar spine were evaluated to detect asymptomatic vertebral fractures. FRAX without BMD was calculated with the web-based tool (Portuguese version).
Results: Median follow-up time was 7,5 $\pm$ 3 y. Mean age at the beginning of follow-up was 65,4 $\pm$ 9,8 years old and most patients were male (79,6%). Median glomerular filtration rate was 28,5 ml/min/1.73m^2 (22–33), 20 patients progressed to dialysis and 5 died. Median FRAX was 3,2% (1,9–5,1) for major fracture and 0,9% (0,4–1,9) for hip fracture risk. When including CKD as secondary osteoporosis, median FRAX was 4,6% (2,7–7,6) for major fracture and 1,5% (0,6–3,4) for hip fracture risk. A total of 14 (25,9%) patients achieved the intervention threshold (FRAX major fracture $\geq$ 11% and/or hip fracture risk $\geq$ 3%) when including CKD as secondary osteoporosis, but only 3 patients were in the high-risk group with FRAX without adjustments. Two patients sustained clinical evident fractures. Radiographies of 51 patients were reviewed and asymptomatic vertebral fractures were identified in 3 (5,9%). High fracture risk calculated by FRAX was more prevalent in the group who sustained fractures, but this difference was only statistically significant when considering CKD as secondary osteoporosis (80 vs. 22,7%, p = 0,019). Area under the curve for FRAX without adjustments was 0,886 (CI 95% 0,781–0,992) and 0,882 (CI 95% 0,777–0,987) with CKD as secondary osteoporosis (Table 1).

Table 1 – Comparison of the accuracy of FRAX® (without BMD) with or without CKD as secondary osteoporosis in predicting fracture risk.

	FRAX® (without BMD) including CKD as secondary osteoporosis	FRAX® (without BMD)
Sensitivity	80% (95% CI 0,372-0,987)	20% (95% CI 0,013-0,628)
Specificity	77,3% (95% CI 0,639-0,879)	95 % (95% CI 0,866-0,992)
Positive Predictive Value	28,6% (95% CI 0,099-0,545)	33,3% (95% CI 0,023-0,839)
Negative Predictive Value	97,1% (95% CI 0,880-0,998)	91,3% (95% CI 0,809-0,972)
AUC for major fracture risk	0,882 (95% CI 0,777-0,987)	0,886 (95% CI 0,781-0,992)
AUC for hip fracture risk	0,820 (95% CI 0,685-0,956)	0,814 (95% CI 0,671-0,956)

Footnote: FRAX- Fracture Risk Assessment; BMD- bone mineral density; CKD – chronic kidney disease; AUC- area under the curve; 95% CI- 95% confidence interval.

Conclusion: FRAX (without BMD) showed an overall good diagnostic accuracy for predicting fractures in predialysis CKD. However, considering CKD a cause of secondary osteoporosis improved the sensitivity of FRAX in this population.

P817
BONE VOLUME VERSUS BONE MINERAL DENSITY: IMPACT ON FRACTURES IN PREDIALYSIS CHRONIC KIDNEY DISEASE

M. Diz Lopes[1], B. Fernandes[2], C. Marques Gomes[1], T. Martins Rocha[1], R. Neto[2], J. Frazão[2], L. Costa[1]

[1]Rheumatology Dept., [2]Nephrology Dept., Centro Hospitalar Universitário de São João, Porto, Portugal

Objective: Chronic kidney disease (CKD) patients develop mineral bone disorder and are at increased fracture risk. Whether the subtype of renal osteodystrophy (ROD) contributes to fracture risk is not established. We aimed to evaluate the relationship of ROD subtypes and bone volume (BV) with the occurrence of fractures in predialysis CKD patients.
Methods: Retrospective study with 54 patients followed in a predialysis clinic between 2014–2023. Bone biopsies and histomorphometric analysis were performed at the beginning of follow-up. Data from DXA scan and regarding clinical evident fractures was recorded from medical registries. Radiographies of the thoracic and/or lumbar spine were evaluated to detect asymptomatic vertebral fractures.
Results: Median follow-up time was 7,5 $\pm$ 3 y. Mean age at time of bone biopsy was 65,4 $\pm$ 9,8 years old and most patients were male (79,6%). The majority had CKD stage 4 (53,7%), 20 patients progressed to dialysis and 5 died. DXA scan was performed in 19 patients and 5 had osteoporosis. In the histomorphometric analysis, 40,7% patients had normal bone histology, 37% low bone turnover (BT) with normal mineralization and 22,3% high BT with normal mineralization. Two patients sustained clinical evident fractures and asymptomatic vertebral fractures were identified in radiographies in 3 patients. Patients who fractured had higher phosphorus levels (4,1 vs. 3,5 mg/dL, p = 0,047, Table 1). BMD, histomorphometric subtypes and circulating bone biomarkers did not correlate with the incidence of fractures. Low BV was more frequent in the fractures group (40 vs. 25,5%) but this was not significant (p = 0,579). However, BV fraction (BV/TV) was lower in the group with fractures (16,1 (11,9–17,2) vs. 19,0 (16,2–23,6)), with borderline significance (p = 0,052). Femoral neck BMD didn't correlate with BV/TV (r = 0,039, p = 0,874).

Table 1 – Characteristics of the groups with and without fractures during follow-up.
Data are reported as mean (SD) for normally distributed variables, median (IQR) for non-normally distributed variables, or percentage for categorical variables. P-values were calculated using Mann-Whitney U test for continuous variables and Chi-square with Fisher exact test for categorical variables.

	Fractures during follow-up n=5 (9,3%)	No fractures during follow-up n=49 (90,7%)	p-value
Biochemistry			
Creatinine	2,2 (1,1)	2,2 (0,5)	0,415
GFR, mL/min/1.73m2	26,5 (15,0)	30,5 (12,0)	0,157
Calcium, mg/dL	4,7 (0,0)	4,8 (0,4)	0,685
Phosphorus, mg/dL	**4,1 (0,8)**	**3,5 (0,95)**	**0,047**
25(OH)Vitamin-D, ng/mL	13,5 (3,0)	16 (9,8)	0,221
Alkaline Phosphatase, U/L	75,5 (19,0)	71 (43,0)	0,815
PTH, pg/mL	105,7 (40,6)	79,9 (93,7)	0,728
FGF23, pg/mL	30,9 (10,8)	22,1 (21,1)	0,874
Sclerostin, pmol/L	83,9 (105,0)	58,4 (44,7)	0,986
DKK1, pg/mL	1004,5 (283,9)	738,0 (498,9)	0,366
sRANKL, pg/mL	2,7 (0,3)	2,5 (1,4)	0,231
Osteoprotegerin, pg/mL	1554,4 (408,3)	1404,1 (545,3)	0,385
DXA scan, n=19			
Femoral neck T-Score	-1,05 (0,7)	-1,4 (1,8)	0,530
Femoral neck BMD	0,90 (0,103)	0.89 (0,185)	0,530
Osteoporosis	0 (0,0)	5 (9,3)	0.665
Bone Histomorphometric Classification			0,833
Normal Bone Histology	3 (60,0)	19 (38,8)	
Low-turnover bone disease	1 (20,0)	19 (38,8)	
High-turnover bone disease	1 (20,0)	11 (22,4)	
Bone volume			0,579
Low (<16%)	2 (40,0)	12 (24,5)	
Normal (16-23%)	3 (60,0)	24 (49,0)	
High (>23%)	0 (0,0)	13 (26,5)	
BV/TV	**16,1 (11,9-17,2)**	**19,0 (16,2-23,6)**	**0,052**

Footnote: GFR – glomerular filtration rate; PTH- Parathyroid hormone; FGF-23- Fibroblast growth factor-23; DKK1- Dickkopf-1; sRANKL- Soluble receptor activator of nuclear factor-kappaB ligand; DXA - Dual x-ray absorptiometry; BMD- bone mineral density; BV/TV: bone volume fraction; IQR- interquartile range; PTH- Parathyroid hormone; FGF-23- Fibroblast growth factor-23; DKK1- Dickkopf-1; sRANKL- Soluble receptor activator of nuclear factor-kappaB ligand; BMD- bone mineral density; FRAX - Fracture Risk Assessment; CKD – chronic kidney disease.

Conclusion: Different ROD subtypes had no association with the incidence of fractures. When considering BV isolated (but not BMD assessed by DXA), a marginally significant association was found between low BV fraction and fractures. High phosphorus levels associated with fractures and have been previously described as a possible risk factor for fractures in CKD patients but also in general population.

P818
CONTRIBUTION OF TBS IN THE PREDICTION OF FRACTURES IN A MALE POPULATION

M. Djennane[1], M. A. Ifticene, L. Igueni[1]

[1]Medicine Dept., Tizi Ouzou, Algeria

Objective: BMD is the reference technique for assessing bone status in men, as in women. TBS is an indirect measure of bone microarchitecture independent of BMD. There are few studies on the contribution of TBS in the male population. The main objective of this work is to describe the link between BMD measurements and TBS in men. The secondary objectives are the study of TBS in patients with vertebral and/or peripheral fractures and to know if the BMD/TBS association made it possible to better predict bone fragility.
Methods: A retrospective study with descriptive and single-center analysis including men with at least one risk factor for osteoporosis. Clinical, radiographic and densitometric data were recorded with measurement of TBS.
Results: 69 patients were identified, the average age was 57 y [19—91 years], the average BMI was 23 kg/m^2. Of the 55 patients interviewed, 23% were smokers. An etiology was found in 54% of cases, these were endocrinopathy (n = 14), corticosteroid therapy (n = 15), anticonvulsants (n = 2), inflammatory rheumatism (n = 9) and 1 case of disease. chronic inflammatory bowel disease. TBS was altered in 57 patients and normal in 13 patients. TBS was weakly correlated with BMD at the spine with a correlation coefficient of 0.352 (p = 0.003), and weakly correlated with BMD at the femoral neck with a correlation coefficient of 0.356 (p = 0.003). TBS was not significantly lower in patients with at least one vertebral fracture (1,189) than in nonfractured patients (1,235), p = 0.3. 46% of patients who had a vertebral fracture had a T-score $\leq$ -2.5 and 100% had an impaired TBS. The mean TBS in patients with and without peripheral fracture was 1,199 and 1,251, respectively (P = 0.08). All those with a peripheral fracture had densitometric osteoporosis and impaired TBS.
Conclusion: Our study, despite the small number, confirms the data in the literature, on the fact that the systematic measurement of TBS is not recommended in the prediction of fracture risk. Indeed in our study we found a weak correlation between TBS and BMD and no significant difference in TBS between the groups with and without fractures (vertebral and/or peripheral).

P819
EFFECTS OF GROWTH HORMONE REPLACEMENT ON BONE MINERAL DENSITY AND BODY COMPOSITION IN PATIENTS WITH CHILDHOOD ONSET GROWTH HORMONE DEFICIENCY (COGHD) DURING TRANSITION PERIOD FROM PEDIATRIC TO ADULTHOOD ENDOCRINE CARE

M. Doknic[1], M. Curcic[2], M. Stojanovic[1], T. Milenkovic[3], V. Zdravkovic[4], M. Jesic[4], S. Todorovic[3], M. Milicevic[5], A. Stanimirovic[5], V. Scepanovic[5], K. Mitrovic[3], R. Vukovic[3], D. Miljic[1], S. Pekic[1], I. Cekic[1], I. Jevtic[1], E. Manojlovic-Gacic[6], D. Grujicic[5], M. Petakov[1], I. Soldatovic[7]

[1]Neuroendocrine Department, Clinic for Endocrinology, Diabetes and Metabolic Diseases, Univ. Clinical Centre of Serbia, Belgrade, Serbia, [2]Faculty of Medicine, Univ. of Belgrade, Belgrade, Serbia, [3]Mother and Child Health Care Institute of Serbia "Dr Vukan Cupic", Belgrade, Serbia, [4]Univ. Children's Clinic "Tirsova", Serbia, Belgrade, Serbia, [5]Clinic for Neurosurgery, Univ. Clinical Centre of Serbia, Belgrade, Serbia, [6]Institute for Pathology, Faculty of Medicine, Univ. of Belgrade, Serbia, Belgrade, Serbia, [7]Institute for Medical Statistics and Informatics, Belgrade, Serbia, Belgrade, Serbia

Mirjana Doknic[1,7], Mihajlo Curcic[7], Marko Stojanovic[1,7], Tatjana Milenkovic[2], Vera Zdravkovic[3,7], Maja Jesic[3,7], Sladjana Todorovic[2], Mihajlo Milicevic[4,7] Aleksandar Stanimirovic[4,7], Vuk Scepanovic[4,7], Katarina Mitrovic[2,7], Rade Vukovic[2,7], Dragana Miljic[1,7], Sandra Pekic[1,7], Ivana Cekic[1], Ivan Jevtic[1], Emilija Manojlovic-Gacic[6,7], Danica Grujicic[4,7], Milan Petakov[1,7], Ivan Soldatovic[5,7]
[1]Neuroendocrine Department, Clinic for Endocrinology, Diabetes and Metabolic Diseases, University Clinical Center of Serbia, [2]Mother and Child Health Care Institute of Serbia "Dr Vukan Cupic", [3]University Children's Clinic Tirsova, [4]Clinic for Neurosurgery, University Clinical Center of Serbia; [5]Institute of Medical Statistics and Informatics, Belgrade, Serbia; [6]Institute for Pathology, Faculty of Medicine, University of Belgrade, Serbia, [7]Medical Faculty, University of Belgrade, Serbia

Objective: To analyze BMD and body composition (BC) in childhood-onset growth hormone deficiency (COGHD) patients on growth hormone replacement (GHr) during the transition period (TP).
Methods: In a monocentric, observational, retrospective cross-sectional study conducted from 2005–2023, 243 COGHD patients were analyzed (17–25 years old, 184 males). Median age at transfer from pediatrics to adult endocrine clinic was 18.2 $\pm$ 3.2 y. Two separate analyses were performed:(a) cross-sectional analysis of BMD and BC at first evaluation after transfer; (b) longitudinal analysis of BMD and BC changes after 3 y of GHr in TP. Body composition (% fat, fat mass—FM and lean body mass—LBM) and BMD in lumbar spine (LS) and femoral neck (FN)—(BMD g/cm^2, Z-score) were analyzed by DXA method.
Results: Patients with pituitary structural abnormalities were classified as congenital (CONG) COGHD accounting 44.5% of included patients. Subjects with a history of cranial tumor and hematological malignancies were marked as a tumoral cause (TUMC) accounting

22.7% and patients of unknown cause of COGHD were assigned to a group of idiopathic (IDOP) which included 32.8% of enrolled individuals. TUMC patients had significantly lower Z-sc LS ($P < 0.05$) and Z-sc FN ($P < 0.05$) compared to CONG and IDOP after the transfer to adult department. IDOP subjects had significantly higher LBM (47.3 ± 10.8 kg) compared to the CONG (41.4 ± 8.4 kg) and TUMC (45.8 ± 7.9 kg) groups ($P < 0.05$) and lower fat% (19.5 ± 5.9%) and FM (14.1 ± 6.4 kg) compared to TUMC (31.4 ± 6.8%; 19.3 ± 7.4 kg) and CONG (27.8 ± 8.2%; 20.4 ± 9.2 kg) groups ($P < 0.05$). We evaluated BMD and BC in 48 (32.7%) patients with persistent GHD continuing GHr in TP after 3 y. Changes in bone mass indicated significant increment of BMD LS by 7.2%. Significant improvement in BC was observed, manifesting as Fat% decrease by 5.8% and LBM increase by 10.8%.

Conclusion: Patients with COGHD caused by a cranial tumor and hematological malignancies are at greatest risk for lower BMD and unfavorable body composition. Continuation of growth hormone treatment in transition period is important for improving BMD and BC in all patients with persistent GHD.

P820
OBSERVATIONAL STUDY ON THE RELATIONSHIP BETWEEN VITAMIN D LEVELS AND VERTEBRAL FRACTURES

M. Dong[1], D. Zhang[1], Y. Ma[1], D. Wang[1], D. Xin[1]

[1]Second Affiliated Hospital of Inner Mongolia Medical Univ., Hohhot, China

Objective: The primary objective of this observational study is to evaluate the association between circulating vitamin D levels and the incidence of vertebral fractures. This study builds upon previous research that has suggested a potential protective role for vitamin D against various types of fractures.

Methods: We use an existing hospitalized dataset. The study focuses on adults aged 50 and above at a higher risk for vitamin D deficiency and vertebral fractures. Explicitly focusing on participants with measured plasma levels of 25-hydroxyvitamin D. The study design allows for analyzing the relationship between vitamin D concentration and the incidence of vertebral fractures over time. The primary outcome is the incidence of clinically diagnosed vertebral fractures. The study will also consider secondary outcomes such as BMD measurements and the occurrence of other types of fractures. The study employed Cox proportional hazards models to estimate the risk of vertebral fractures across different vitamin D levels, adjusting for potential confounders such as age, sex, BMI, lifestyle factors, calcium and vitamin D supplementation, and comorbid conditions.

Results: Higher vitamin D levels will be associated with a lower risk of vertebral fractures, and there is a threshold effect or a dose–response relationship.

Conclusion: This study's findings provide further evidence of the role of vitamin D in bone health, specifically in preventing vertebral fractures. These findings could have significant implications for public health recommendations and clinical practices regarding vitamin D supplementation, especially in populations at risk of vitamin D deficiency and osteoporosis.

P821
ROLE OF ASTRAGALUS MEMBRANACEUS IN OSTEOPOROSIS: AN ANALYSIS OF ITS POTENTIAL IN MANAGING POSTMENOPAUSAL BONE LOSS

M. E. I. Dong[1], D. D. Zhang[1]

[1]Second Affiliated Hospital of Inner Mongolia Medical Univ., Hohhot, China

With the rapid growth of the aging population, osteoporosis, an age-related skeletal disease, is becoming increasingly prevalent. In China, where over 210 million people are aged 60 and above, representing about 15.5% of the total population, osteoporosis is a significant public health concern. This abstract summarizes the potential of Astragalus membranaceus, a perennial herb in traditional Chinese medicine, in managing postmenopausal osteoporosis.

Astragalus membranaceus, found in Northeast, North, and Northwest China, and it 's variant Astragalus membranaceus var. mongholicus in Inner Mongolia, Hebei, and Shanxi, have been used in traditional Mongolian medicine primarily for qi tonification, diuresis, detoxification, and wound healing. Recent studies have highlighted its potential in myocardial protection, blood pressure regulation, immune enhancement, and overall health improvement. Its application extends to alleviating joint pain, weakness, and fatigue.

The phytoestrogen activity of Astragalus membranaceus extracts, similar to estrogen, is particularly noteworthy in postmenopausal osteoporosis. Phytoestrogens are non-steroidal compounds in many plants, fruits, and vegetables, showing both estrogenic and anti-estrogenic effects. They are categorized into isoflavones, coumestans, or lignans. Postmenopausal hormone therapy, which addresses the significant decrease in estrogen during menopause, is a known preventive measure against osteoporosis.

The pharmacological properties of Astragalus membranaceus are attributed to its diverse components, including polysaccharides, saponins, flavonoids, amino acids, and trace elements. Its polysaccharides, like Astragalus polysaccharides (APS), are known to improve BMD, structure, and formation in postmenopausal osteoporosis animal models. They may promote osteoblast proliferation and differentiation, enhancing new bone tissue formation. Additionally, APS could regulate the balance between bone resorption and formation, reducing the risk of osteoporosis. Its anti-oxidative and anti-inflammatory mechanisms could mitigate oxidative stress and inflammation damage to bone cells. Astragaloside II and IV, specific saponins in Astragalus membranaceus, stimulate osteoblast activity and bone formation, potentially offering benefits to postmenopausal women. Astragalin, a flavonoid in Astragalus membranaceus, exhibits anti-inflammatory and antioxidant potentials, suggesting its role in bone protection.

Astragalus membranaceus, with its polysaccharides, saponins, and flavonoids, demonstrates a promising potential in managing postmenopausal osteoporosis. Further research is warranted to explore how these components influence osteoclast generation and regulate the dynamic balance of the bone matrix, potentially inhibiting the expression of cathepsin K, c-Fos, NFATc1, and NFATc2, crucial in bone resorption processes.

P822
HOSPITALISED RHEUMATOID ARTHRITIS PATIENTS HAVE SIGNIFICANTLY GREATER MORTALITY

M. Ebrahimiarjestan[1,2], J. Carey[2,3], L. Yang[4], E. E.[5], T. Wang[6], C. Silke[2,7], M. O'Sullivan[2,7], A. Brennan[8], M. Dempsey[9], M. Yu[1], B. Whelan[2,7]

[1]Dept. of Industrial Engineering, Tsinghua Univ., Beijing, China, [2]School of Medicine, National Univ. of Ireland, Galway, Ireland, [3]Dept. of Rheumatology, Univ. Hospital Galway, Galway, Ireland, [4]Insight SFI Research Centre for Data Analytics, Data Science Institute, Galway, Ireland, [5]School of Management, Guangxi Minzu Univ., Nanning, China, Nanning, China, [6]Nuffield Dept. of Medicine, Univ. of Oxford, Oxford, UK, Oxford, UK, [7]Dept. of Rheumatology, Our Lady's Hospital, Manorhamilton, Ireland, [8]School of Computer Science, National Univ. of Ireland, Galway, Ireland, [9]School of Engineering, National Univ. of Ireland, Galway, Ireland

Objective: Rheumatoid arthritis (RA) patients are at greater risk of hospitalisation and death. The DXA HIP Project is studying DXA performance and musculoskeletal diseases in Ireland. We used the DXA HIP Cohort to evaluate the mortality of RA patients requiring hospitalisation in the west of Ireland, and compared them to a 'healthy' control population and an 'other' with osteoporosis, risk factors or fractures.
Methods: Data from 4 DXA machines were merged with administrative hospital data, cleaned and anonymised following I.R.B. approval, as previously described. Patients were included if they had a proximal femur DXA scan and at least 1 follow-up overnight hospital admission. We excluded those who were not white (1%) and < 20 y of age. This cohort was further sub-divided into those groups described above. Mortality risk was compared using a Kaplan – Meier analysis. A p value of < 0.05 was considered statistically significant for all analyses.
Results: 20,466 subjects met our inclusion criteria including 1,358 (6.6%) with RA, 6686 (32.7%) 'healthy' and 12,422 (60.7%) 'others'. RA patients were significantly younger and lighter than 'healthy' subjects, but had similar BMD. RA patients were also significantly younger and a lower prevalence of fracture, glucocorticoid and tobacco use than 'other' subjects but higher BMD. However, RA subjects had a significantly greater mortality than both 'healthy' and 'other' subjects, shown if the plot below, HR: 1.31, $P < 0.01$.
Conclusion: RA patients requiring hospitalisation are at significantly greater risk of death than either healthy controls or those with osteoporosis or other risk factors. Further studies are needed to evaluate better ways of managing these patients.
Acknowledgement: This project was funded by the Health Research Board of Ireland: S.D.A.P.-2020–0001.

P823
EFFECTS OF STATINS ON BONE HEALTH

M. Payab[1], M. Ebrahimpur[2], F. Sharifi[2], Z. Shadman[2], P. Ebrahimi[3], S. Mohammadi[4], M. Gooshvar[5], M. Sarvari[6]

[1]Non-Communicable Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, [2]Elderly Health Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, [3]Tehran Heart Center, Tehran Univ. of Medical Sciences, [4]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [5]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [6]Metabolomics and Genomics Research Center, Endocrinology and Metabolism Molecular-Cellular Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Osteoporosis, characterized by a decline in BMD, has become increasingly prevalent among the elderly in recent times. This systematic review and meta-analysis aim to explore the potential impact of statin medications on bone health, contributing to improved clinical management and treatment strategies for those at risk of osteoporosis and fractures.
Methods: Utilizing international databases such as PubMed, Embase, Scopus, ProQuest, and Web of Science, we identified 61 studies (45 observational and 16 randomized controlled trials) involving a total of 9,610,432 participants. In observational studies, a meta-analysis was conducted to evaluate the effects of statins on BMD, hip fractures, and other fractures.
Results: The analysis revealed that non-users had a 33.7% higher risk of hip fractures compared to statin users (odds ratio [OR] = 0.663), and the risk of other fractures was 16.2% higher in non-users than statin users (OR = 0.838). Statin users also exhibited higher BMD at the lumbar spine (standardized mean difference [SMD] = 0.082), femoral neck (SMD = 0.135), and hip (SMD = 0.101) in observational studies.
Conclusion: The most clinical trials included in this study did not find a significant association between statin consumption and bone metabolism or markers. While evidence from diverse populations suggests a positive correlation between statin medication and bone health, further research, particularly clinical trials, is essential to enhance the generalizability of these findings.

P824
RESULTS OF LABORATORY EXAMINATION OF PATIENTS INCLUDED IN THE FRACTURE LIAISON SERVICE

M. Fominykh[1], K. Belova[2], L. Evstigneeva[3], O. Lesnyak[4], E. Gladkova[5], E. Dudinskaya[6], Y. Polyakova[7], A. Tarasova[8], L. Sivordova[7], T. Kendys[8], V. Tanaev[5], E. Bublik[9], A. Akhatov[10]

[1]Ural State Medical Univ., Ekaterinburg, [2]Yaroslavl State Medical Univ., Yaroslavl, [3]Regional Clinical Hospital No. 1, Ekaterinburg, [4]North-Western State Medical Univ. named after I.I. I.I. Mechnikov, St. Petersburg, [5]City Polyclinic No. 25 of the Nevsky District, St. Petersburg, [6]Russian National Research Medical Univ. named after N.I. Pirogov Ministry of Health of the Russian Federation, Moscow, [7]Federal State Budgetary Scientific Institution A.B. Zborovsky, Volgograd, [8]Clinical Medical and Surgical Center of the Ministry of Health of the Omsk Region, Omsk, [9]Central Clinical Hospital with a Polyclinic, Office of the President of the RF, Moskow, [10]Barsmed, Kazan, Russia

Objective: To analyze lab examination tests in patients included in the Fracture Liaison Service (FLS).
Methods: We assessed the data of the patients with fragility fractures included in the registry "Prometheus" and enrolled in 12 FLS in Russian Federation. The results of laboratory tests were assessed (hematology, biochemical parameters, bone markers and vitamin 25(OH)D).
Results: The study included 895 patients: 111 men (12.0%) and 784 women (88.0%) aged 50–95 years, the average age was 71.7 ± 9.76 years old. 25(OH) D was performed in 231 (25.8%) patients. Normal values were found in 79 (34.2%) patients, insufficiency in 72 (31.2%), deficiency in 68 (29.4%), severe deficiency in 12 (5.2%) patients. Serum calcium was examined in 641 patients, in 84 (13.1%) of them it was decreased, and in 20 (3.1%) it was increased. The serum creatinine value was higher than the normal level in 92 (12.1%) of the 762 results, 25 (3.3%) patients had low GFR (< 35 ml/min). Alkaline phosphatase was increased in 86 (14.1%) of 613 people, nobody had

decreased level. Phosphorus was examined in 572 persons, it was high in 12 (2.1%) and low in 29 (5.1%) cases. Elevated level of PTH was detected in 27 (20.6%) of 131 subjects. Thyroid-stimulating hormone was increased in 7 (5.1%), and was below normal value in 1 (1.4%) of 136 patients. The level of total protein was increased in 2 (0.7%) people, decreased in 23(8.1%) of 285 subjects.
Conclusion: Laboratory examination has an importance for patients enrolled in the FLS to identify the secondary causes of osteoporosis and contraindications for drug therapy. The detection of abnormalities in laboratory tests requires additional diagnostics and balanced approach to the selection of the antiosteoporotic medications.

P825
ANALYSIS OF MEDICAL CARE FOR HIP FRACTURES IN THE OLDER AGE GROUP IN THE SVERDLOVSK REGION FOR THE PERIOD FROM 1997–2023

M. Fominykh[1], L. Evstigneeva[2], R. Ryabov[1], D. Gavrikov[1]

[1]Ural State Medical Univ., [2]Regional Clinical Hospital No. 1, Ekaterinburg, Russia

Objective: To analyze medical care for hip fractures in older age group in the Sverdlovsk region for the period from 1997–2023.
Methods: A retrospective study was based on the medical documentation of all traumatology hospitals in Yekaterinburg (1997), all medical records of patients hospitalized in the traumatology department in Yekaterinburg (2021) and monitoring data on the provision of medical care for hip fracture in residents of the Sverdlovsk region (2023).
Results: In 1997, 540 cases of hip fractures: 126 (23.3%) in men and 414 (76.7%) in women. Only a half patients with hip fractures were hospitalized in trauma city hospitals, 272 (50.4%) were sent for outpatient treatment. In the majority of hospitalized patients were 107 (39.8%) with skeletal extension. Surgical treatment was performed in only 9.8%. Hip replacement was not performed in this study group. No one has received treatment for osteoporosis. In 2021, 549 patients were hospitalized with hip fractures, including 145 (26.4%) men and 404 (73.6%) women. Surgical treatment was performed in 437 (83.2%) patients. Surgical treatment included osteosynthesis in 285 (65.2%), hip replacement in 152 (37.8%). 39 (7.1%) people took calcium and vitamin D3 supplements after a fracture, 10 (5.5%) people took antiresorptive drugs. In 2023, hip fractures in residents of the Sverdlovsk region aged 60 y and older occurred in 2174 people, of whom 549 (25.3%) men and 1625(74.7%) women. Hip fractures were most common in the age group of 85 years and older. 1922 (88.4%) were hospitalized. Surgical treatment was performed in 1423 (74%) hospitalized patients (osteosynthesis in 1112 (71.1%), hip replacement in 311 (28.9%)). Surgical activity in patients aged 85 y and older (70.1% of patients in this age group were operated on) did not significantly differ from surgical activity in patients under 85 y of age (75.4%). The diagnosis of osteoporosis during hospitalization was established in 29.7%, calcium and vitamin D3 supplements were received by 26.6% of patients, antiresorptive drugs in 17.8%.
Conclusion: The analysis of medical care for hip fractures demonstrated an increase in surgical activity, an increase in the number of patients diagnosed with osteoporosis who receive calcium, vitamin D3 and antiresorptive drugs. However, the diagnosis of osteoporosis remains low. Increase the number of patients taking calcium supplements, vitamin D3 and antiresorptive drugs to improve the detection of osteoporosis. It is necessary to implement the Fracture Liaison Service more widely.

P826
DETERMINATION OF CARPAL INSTABILITY IN RHEUMATOID ARTHRITIS

M. Foteva[1], A. Andonovski[1]

[1]Univ. Clinic for Orthopedic Surgery- Skopje, Skopje, North Macedonia

Objective: Carpal instability is a biomechanical alteration with multiple pathogenesis which occurs when there is disruption of the normal ligamentary and bony relations that control the wrist. There are four major types of carpal instability: 1.DISI 2.VISI 3. Ulnar translocation and 4. Midcarpal instability. Instability of the rheumatoid wrist can result from incongruity of the articular and bony surfaces, capsular and ligamentary laxity and muscle–tendon imbalance. The aim of this study is by using radiographic evaluation of the wrist to answer the questions: Is there carpal instability in the rheumatoid wrist and if so, what patterns of carpal instability exist?
Methods: In 30 patients with affirmed rheumatoid arthritis we took lateral and anteroposterior radiographies in neutral position of both hands. On the anteroposterior radiographs we measured the carpal-ulnar distance. On the lateral radiographs we used the so-called axial method od Linscheid for drawing carpal axes which form angles that define the positions of the carpal bones: Scapholunate, radiolunate and capitolunate angle.
Results: From total of 60 rheumatoid hands, in 50 we determined presence of carpal instability, as follows: ulnar translocation (32 hands), VISI (14 hands), DISI (4 hands). Of these, isolated form of instability was present in 38 hands, while in large number of hands there was complex carpal instability, i.e. a combination of two patterns of instability (12 hands).
Conclusion: The method of radiographic determination of carpal instability allows detection and quantitative analysis for evaluation of carpal instability in rheumatoid arthritis.

P827
IMPACT OF ANTI-OSTEOPOROSIS MEDICATIONS ON THE RISK OF RECURRENT HIP FRACTURE

D. Shklovsky[1], I. Panksy[2], U. Yoel[3], R. Abuhasira[4], M. Fraenkel[3]

[1]Endocrine Unit, Soroka Univ. Medical Center, [2]Clinical Research Center, Soroka Univ. Medical Center, [3]Endocrine Unit, Soroka Univ. Medical Center and Faculty of Health Sciences, Ben-Gurion Univ. of the Negev, [4]Clinical Research Center, Soroka Univ. Medical Center and Faculty of Health Sciences, Ben-Gurion Univ. of the Negev, Beer-Sheav, Israel

Objective: To evaluate the impact of anti-osteoporosis medication on this risk of second OHF.
Methods: This retrospective population-based study included all patients 50 years and older, insured by Clalit Health Services (CHS) nationwide, who were operated for OHF at any of CHS hospitals between 1/2012 and 12/2021. Inclusion criteria were hospitalization with the diagnosis of OHF and surgical repair of the fracture using ICD-9 codes. Main exclusion criteria were malignancy diagnosed in the 3 years prior to the first fracture, periprosthetic, and sub-trochanteric fractures. MDClone platform was used to retrieve demographic, clinical, biochemical, and drug purchase data. Hazard ratios for second OHF were assessed by using univariable and multivariable Fine & Grey regression models, that account for the competing risk of death.
Results: Among the 9425 patients with OHF who met our study criteria, 645 (6.8%) experienced a second OHF, 5140 patients (54.5%) died without a second hip fracture, and 3640 (38.7%) were alive without a second OHF at end of follow-up. Median follow-up

was 3.4 y (IQR:1.7,5.7). Median time to a second OHF was 2.1 years (IQR:0.7,4). The average age at first fracture for patients with a second fracture was comparable to that of the entire study population (80 ± 9 vs. 80 ± 10 y, respectively). After their initial fracture, 17% of patients who later experienced a second OHF received oral bisphosphonates, compared to 12.7% of those who did not suffer a second fracture. Fifteen percent of the second-fracture group received zoledronic acid and/or denosumab compared to 20.8% of those who did not experience a second fracture. In multivariable analysis adjusted for age, sex, Charlson Comorbidity Index and socioeconomic score at first OHF, patients who received zoledronic acid and/or denosumab after their initial hip fracture, and throughout the follow-up period, showed a significantly lower risk of a second OHF, compared to those without treatment (HR: 0.65 CI 0.52–0.82). Conversely, no significant difference in risk was shown for oral bisphosphonates (HR: 1.18, CI 0.95–1.46). Similar effects were observed in patients who received these medications within 2 y of their first OHF.

Conclusion: Administration of zoledronic acid and/or denosumab after the first OHF was associated with a significant risk reduction in second OHF.

P828
USE OF ETELCALCETIDE FOR PRESERVING VITAMIN K-DEPENDENT PROTEINACTIVITYITALIAN STUDY (ETERNITY- ITA STUDY): RATIONALE AND DESIGN OF THE STUDY ON REAL WORLD EVIDENCE

M. Fusaro[1], M. Gallieni[2], G. Re Sartò[3], A. Cossettini[4], L. Cosmai[5], C. Marino[6], A. Aghi[7], G. Tripepi[6]

[1]IFC-CNR Pisa and Univ. of Padua, Padova, [2]Dept. of Biomedical and Clinical Sciences 'Luigi Sacco', Università di Milano, Milano, [3]Università degli Studi di Milano, Milano, [4]Post-Graduate School of Specialization in Nephrology, Univ. of Milano, Milano, [5]Division of Nephrology and Dialysis, Azienda Socio-Sanitaria Territoriale (ASST) Fatebenefratelli-Sacco, Fatebenefratelli Hospital, Italy, Milano, [6]National Research Council (CNR), Institute of Clinical Physiology (IFC), Reggio Calabria, [7]Independent Researcher, Padova, Italy

Vascular calcifications (VCs) are prevalent in chronic kidney disease (CKD) and mineral disorders, associated with aortic calcification and increased bone fracture risk. The complex pathogenesis involves factors like calcium overload, phosphate imbalance, and secondary hyperparathyroidism. Key inhibitors, vitamin K-dependent proteins (VKDPs) like matrix Gla protein (MGP) and osteocalcin (BGP), play pivotal roles in VC development. Traditional VC risk reduction focuses on lowering PTH, calcium and phosphorus levels. Etelcalcetide, a synthetic peptide activating the calcium-sensing receptor, demonstrates promise in clinical trials. Studies on Vitamin K Italian (VIKI) show that calcimimetic treated hemodialysis patients exhibit higher levels of total BGP and MGP, suggesting a protective effect. These findings underscore the multifactorial nature of VC in CKD, informing refined treatment strategies and targeted pathways for improved outcomes. The proposed study will investigate real world evidence of the effect of Etelcalcetide in preserving active forms of VKDPs among total MGP and total BGP with a resulting reduction of those inactive such as dephosphorylated-undercarboxylated MGP or dp-uc MGP, undercarboxylated BGP or uc-BGP, thus contributing to bone and vascular health in hemodialysis patients (Table 1).

Table 1. Inclusion and exclusion criteria.

Condition or disease	Intervention/treatment	Phase
Chronic Kidney Disease, Mineral and Bone Disorder, Renal Osteodystrophy, Vascular Calcification, Hyperparathyroidism; Secondary, Renal	Drug: Etelcalcetide	This is prospective observational study of comparative effectiveness.
Inclusion criteria:		
1. Patient has provided informed consent. 2. Patient is 18 years of age or older of both gender 3. Patients receiving maintenance HD three times per week (Kt/V ≥1.2) 4. PTH concentrations >500 ng/l at screening, or if parathyroidectomy is planned or expected, Ca >8.3 mg/dl;		
5. Will be considered patients in the exposed group: a. Patients who have started Etelcalcetide within 1-month before the study enrolment b. Patients naïve to intravenous calcimimetics use c. Patients who have suspended oral calcimimetics from at least 1-month, d. Patients who are not responder or not compliant to the treatment with calcitriol 6. In the unexposed group, patients on treatment with calcitriol or vitamin D analogs and who are age (±2 y) and sex comparable (matching) to those in the exposed group will be considered. 7. Native vitamin D can be used in both groups and should be administered to target a 25(OH)D level >30 ng/ml 8. Dialysate calcium concentration must be stable for at least 4 weeks prior to screening laboratory assessments. 9. Patient must have severe HPT as defined by two laboratory screening pre-dialysis serum PTH values >500 pg/ml, measured on two consecutive lab checks prior to entering the study. 10. Total alkaline phosphatase greater than the normal range, or even within the normal range but if greater than the tertile of the reference range for the assay. 11. Patients will be eligible only if they will show at least a /moderate Aorta VCs (16) and/or Iliac arteries VCs and at least a mild VF (17,18).		
Exclusion Criteria:		
1. Previous treatment with oral calcimimetics (cinacalcet) must have been suspended for at least 30 d. Recent start of calcimimetics (etelcalcetide) is acceptable, but patients are excluded if treatment lasts for more than 1 month. 2. Patients has received a bisphosphonate, denosumab or teriparatide during the 12 months prior to screening. 3. The patient underwent parathyroidectomy in the 6 months before the start of the study or if scheduled soon. 4. Scheduled kidney transplant during the study period or anticipated living donor evaluation within three months of recruitment 5. Patient has an unstable medical condition based on medical history, physical examination, and routine laboratory tests, or is otherwise unstable in the judgment of the Investigator. 6. Metabolic bone diseases not related to the kidney (i.e., Paget's, osteogenesis imperfecta) 7. Severe untreated hyperthyroidism		
8. Malignancy within the last 3 y (except non-melanoma skin cancers or cervical carcinoma in situ). 9. Patient is pregnant or nursing. 10. Patients with Long QT Syndrome 11. Patient likely to not be available to complete all protocol-required study visits or procedures, and/or to comply with all required study procedures to the best of the patient and Investigator's knowledge.		

This is a multicenter comparative effectiveness observational longitudinal study with no predefined interference on drug dosing on the part of the investigators. The study will enroll 160 hemodialysis patients: 80 patients considered in the exposed group (treated with Etelcalcetide) and 80 age and sex matched patients considered in the unexposed group (treated with Calcitriol or vitamin D analogs). The treating nephrologist will base their target dose of Etelcalcetide on an individual-level patient basis in order to achieve the KDIGO PTH target level. In the Etelcalcetide-treated group, the addition of

calcitriol is allowed when required by normal clinical practice (for correction of hypocalcemia) (Fig. 1).

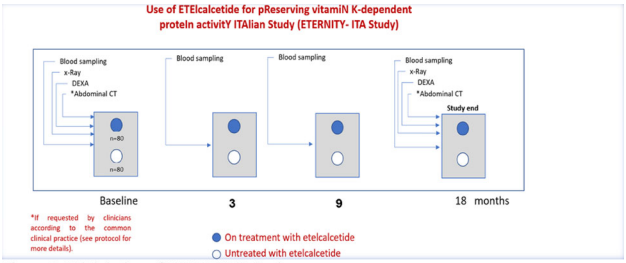


Figure 1. Trial design of ETERNITY Study.

The primary endpoint is the comparison of the levels of active and no-active forms of VKDP between patients treated with etelcalcetide and those treated with vitamin D or vitamin D analogues. The two groups will be compared for longitudinal changes in the following biomarkers, measured at baseline and after 3, 9, and 18 months of treatment: total MGP, dephosphorylated-undercarboxylated MGP, total BGP, and undercarboxylated BGP. As secondary outcomes will be evaluated bone vascular markers levels, serum calcification propensity T_{50} test, anemia markers levels, dialysis routine biomarkers, changes from baseline prevalence VCs (Aorta and Iliac arteries) and vertebral fractures by lateral dorsal lumbar spine x-Ray and BMD by DXA.

P829

CKD-MBD MANAGEMENT: RESULTS FROM A NATIONAL SURVEY ON BONE TURNOVER BIOMARKERS PRACTICE AND THERAPEUTIC STRATEGIES AMONG ITALIAN NEPHROLOGISTS

M. Fusaro[1], G. Re Sartò[2], M. Gallieni[3], S. Bianchi[4], L. De Nicola[5], M. Plebani[6], M. Zaninotto[7], A. Cossettini[8], L. Cosmai[9], C. Marino[10], A. Aghi[11], G. Tripepi[10]

[1]IFC-CNR Pisa and Univ. of Padua, Padova, [2]Università degli Studi di Milano, Milano, [3]Dept. of Biomedical and Clinical Sciences 'Luigi Sacco', Università di Milano, Milano, [4]Dept. of Internal Medicine, Nephrology and Dialysis Complex Operative Unit, Livorno, [5]Division of Nephrology, Dept. of Scienze Mediche e Chirurgiche Avanzate, Univ. of Campania, Napoli, [6]Laboratory Medicine Unit, Dept. of Medicine, Univ. of Padua, Padova, [7]Laboratory Medicine Unit, Dept. of Medicine, Univ. of Padua, Padova, [8]Post-Graduate School of Specialization in Nephrology, Univ. of Milano, Milano, [9]Division of Nephrology and Dialysis, Azienda Socio-Sanitaria Territoriale (ASST) Fatebenefratelli-Sacco, Fatebenefratelli Hospital, Milano, [10]National Research Council (CNR), Institute of Clinical Physiology (IFC), Reggio Calabria, [11]Independent Researcher, Padova, Italy

Objective: Advanced stages of chronic kidney disease (CKD) are constantly characterized by a mineral and bone disorders (MBD) syndrome concerning a complex systemic condition that includes laboratory abnormalities of bone and mineral metabolism involving calcium, phosphorus, PTH, or vitamin D; abnormalities in bone turnover, mineralization, volume, or strength; extraskeletal calcifications, such as vascular or other soft tissue. CKD-MBD syndrome determines relevant consequences in terms of fragility fractures, cardiovascular events and higher mortality. The nephrologist's awareness of CKD-MBD diagnostic and management tools and therapeutic strategies is key to improving CKD patients' prognosis and outcomes.

Methods: A new national survey (composed of 17 online questions) was conducted among Italian nephrologists to investigate the reference laboratory availability of bone turnover markers (BTMs), the clinical attitude on secondary hyperparathyroidism (sHPT) management, and the CKD-MBD therapeutic approach in different stages of CKD and dialysis patients.

Results: 89 Italian nephrologists participated in the survey. The reference laboratories largely fulfill the biomarkers request of ionized calcium (97.7%), phosphorus (100%), PTH (100%), alkaline phosphatase (ALP) (100%), magnesium (100%), 25-OH and 1,25-OH vitamin D levels (92.1%; 53.9%); while most of the hospital laboratories do not regularly support the availability of specific BTMs, both for diagnosis and monitoring the bone resorption and formation (Fig. 1), such as bone ALP (75.3%), calcifediol (37.1%), calcitriol (40.5%), FGF23 (intact 9% and C-terminal 4.5%), vitamin K (33.7%), Klotho (6.75%, soluble 4.5%), osteocalcin (38.2%), matrix gla protein (10.1%), TRAP-5b (6.75%), CTX (32.6%) and P1NP (10.1%). The nephrologist's attitude to start management and treatment of sHPT is revealed to be mainly led by KDOQI (n = 42, 47%) and KDIGO (n = 39, 44%) guidelines considering their PTH cut-off values; in 53.9% of clinicians the measure of PTH levels is then performed every 3 months according to KDOQI guidelines. In relation to the definition of high turnover metabolic bone disease by BTMs, this metabolic pattern is identified in $>$ 50% and 30–40% of patients with CKD 4-5D by 31.5% and 21.4% of nephrologists, respectively. 65% of clinicians currently considered ALP of equal importance as alterations of PTH as a predictor of fracture events. Other biomarkers, such as FGF23, P1NP or TRAP-5b, emerge to not be still used in regular clinical practice. In patients diagnosed with CKD-MBD and skeletal fragility, 76.4% of nephrologists consider the AIFA (Italian Medicines Agency) note 79 to support osteoporosis treatment. The therapeutic strategies of CKD-MBD include the administration of vitamin D (e.g., cholecalciferol 27–37.1%, calcifediol 9–12.4%, calcitriol 42.7–55.1%) and its analogs (e.g., paricalcitol 23.6–52.8%) and the use of antiresorptive agents (e.g., alendronate 3.4%-23.6%, denosumab 22.5%-30.3%) with variable frequencies among different advanced CKD stages and for those patients on peritoneal or hemodialysis (Fig. 2).

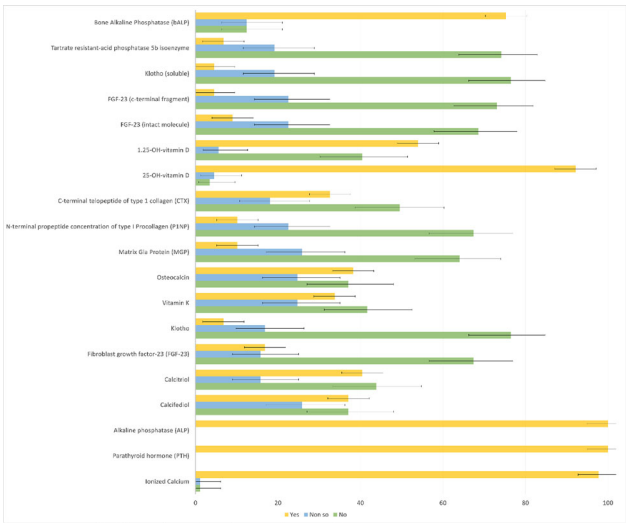


Figure 1. Availability of markers from reference laboratory.

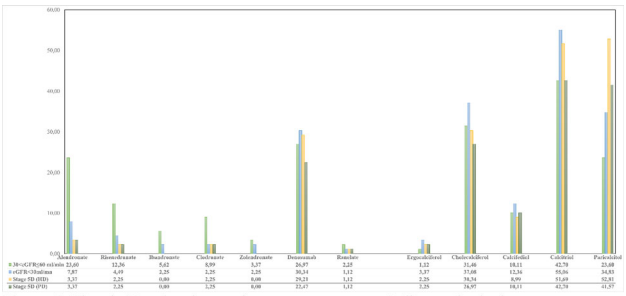


Figure 2. Vitamin D and antiresorptive agents use among Italian nephrologists.

Conclusion: Results present a suboptimal use of BTMs and a current heterogeneous therapeutic management of CKD-MBD syndrome and renal osteodystrophy in Italian clinical practice. The survey represents a starting point of work to further implement awareness of diagnostic and therapeutic issues of CKD-MBD.

P830
ROLE OF VITAMIN D AS A HUMORAL REGULATOR IN PATIENTS WITH METABOLIC SYNDROME

M. Ghasaboghlyan[1], V. Mukuchyan[2], L. Baghdasaryan[2], V. Babalyan[3], V. Vardanyan[4], A. Jaghinyan[1]

[1]Vardanants Medical Center, [2]Nairi Medical Center, Yerevan, Armenia, [3]Varta Babalyan, Osteoporosis Center, [4]Mikayelyan Univ. hospital, Yerevan, Armenia

Objective: Metabolic syndrome (MS) is a common set of metabolic risk factors, which include high blood pressure, atherogenic dyslipidemia, insulin resistance and central obesity. Metabolic syndrome is diagnosed by at least 3 of the listed criteria: abdominal obesity (BMI $>$ 30 kg/m^2), fasting glucose over 5.6 mmol/L, dyslipidemia (triglycerides $\geq$ 1.7 mmol/L, HDL for men $<$ 1 mmol/L and $<$ 1.3 mmol/L for women), high blood pressure ($\geq$ 130/80 mm Hg) or receiving an appropriate treatment for the latter. Vitamin D is a steroid hormone that has an essential effect on the mechanisms of physiological activity of the organism. In obesity, vitamin D affects insulin secretion, adipokine synthesis by adipose tissue through its direct and paracrine effects through activation of vitamin D receptors (VDR) in the pancreas. The purpose of this study is to show the connection between vitamin D insufficiency and insulin resistance.
Methods: 30 male patients (ages 23–47) with MS were enrolled in the study. All of them had hypertension (BP $\leq$ 140/90 mm Hg), dyslipidemia (triglycerides $\geq$ 1.9–3.2 mmol/L, HDL $\leq$ 35–50 mmol/L), BMI of 30–36 kg/m^2 and insulin resistance (HOMA-IR $<$ 2.7–6.0). The patients were split into two groups: the first group of patients (n = 15) received antihypertensive, antihyperlipidemic medication, Semaglutide 0.25–1.0 IU weekly by gradually increasing the dose and recommendations about healthy lifestyle and physical activity. The second group of patients (n = 15) received the same treatment and recommendations as the 1st group as well as vitamin D 50,000 IU weekly for 9 months along with that. Every 3 months blood tests were done, and BMI was measured.
Results: 9 months later significant regulation of dyslipidemia, arterial hypertension, insulin resistance and BMI were observed in group 2 patients (P = 50%).
Conclusion: Administration of vitamin D 50,000 IU weekly has a positive effect in regulation of MS, particularly in regulation of insulin resistance.

P831
TREATMENT OF SECONDARY LYMPHEDEMA FOLLOWING RADICAL PROSTATECTOMY

M. Gocevska[1], C. Gjerakaroska Savevska[1], V. Koevska[1], B. Mitrevska[1], B. Kalchovska Ivanovska[1], M. Manoleva[1], E. Nikolikj Dimitrova[1], D. Gecevska[1]

[1]Univ. Clinic of Physical Medicine and Rehabilitation; Faculty of Medicine, Ss Cyril and Methodius Univ., Skopje, North Macedonia

Lymphedema (LE) is a progressive chronic disorder frequently related to malignancies and their treatment. It markedly affects patients' quality of life, and its management is challenging, mainly based on conservative therapy such as bandages and manual lymphatic drainage, with limited results.
Case report: A 75-year-old male patient, retired, reported a one-year history of increasing volume in the leg as a whole, with leg swelling associated with a feeling of heaviness after walking. His past medical history was significant. Three years ago, he underwent transurethral resection of the prostate (histopathology- prostate adenocarcinoma, grade III), followed by hormone therapy and external radical radiation therapy. The physical examination revealed an enlarged scrotum with normal skin, unilateral edema of the lower limb, with spider and reticular veins, and pigment trophic skin changes of the pretibial region. Ultrasound scan, computerized tomography scan, and MRI of the abdomen and pelvis did not show recurrence or dissemination of previous cancer. He was treated with complex decongestive physiotherapy (CDP), which involved: skin care, lymph drainage of the affected lower extremity, low-stretch multilayered compression bandaging of the limb, and exercises. After four weeks of CDP, he reported reducing symptoms, especially in the affected lower limb, reducing swelling, and improving walking distance. LE of the scrotum remained the same as before treatment, while lymphedema of the lower limb was reduced.
Conclusion: CDP can help reduce secondary lymphedema following radical prostatectomy and improve the quality of life for these patients.

P832
RUPTURE OF THE SERRATUS ANTERIOR MUSCLE: A CASE REPORT

M. Gocevska[1], C. Gjerakaroska Savevska[1], V. Koevska[1], B. Mitrevska[1], M. Manoleva[1], B. Kalchovska Ivanovska[1], E. Nikolikj Dimitrova[1], D. Gecevska[1]

[1]Univ. Clinic of Physical Medicine and Rehabilitation; Faculty of Medicine, Ss Cyril and Methodius Univ., Skopje, North Macedonia

Trauma affecting the serratus anterior muscle (SA) typically results from injury to the long thoracic nerve, with muscle rupture being uncommon.
Case report: A 19-year-old man presented with a history of falling on his left side two months prior. Since then, he experienced persistent left shoulder pain and difficulty raising his arm above scapular level, hampering her daily activities. Physical examination from the rear revealed moderate drooping of the left shoulder and winged scapula upon arm elevation. Mild tenderness was noted when attempting to raise the arm beyond a right angle. A soft mass was palpable along the lower half of the vertebral border of the left scapula, which was non-painful and reducible upon pressure. Neurological examination findings were normal. Ultrasound and CT scan revealed a hernia of the SA along the vertebral border of the left scapula, accompanied by fatty degeneration of the muscle. A 12-week course of rehabilitative treatment aimed at pain relief, improving shoulder range of motion, and strengthening the trapezius, levator

scapulae, and rhomboids resulted in significant functional improvement.
Discussion: Diagnostic confirmation in this case was aided by ultrasound and CT scan findings indicating fatty degeneration of the muscle. Although a fall history preceded pain, disability, and local tenderness, the precise mechanism of trauma remained unclear, possibly involving abrupt contraction of the serratus anterior when the scapula was forcefully fixed against a surface.
Conclusion: Serratus anterior muscle rupture is less common than long thoracic nerve injuries. Features such as winging scapula and a palpable soft mass along the lower spinal border of the scapula are indicative of SA rupture.

P833
SUCCESSFUL TREATMENT OF GLUTEUS MEDIUS CALCIFIC TENDINOPATHY WITH RADIAL EXTRACORPOREAL SHOCK WAVE THERAPY: A CASE STUDY

M. Gocevska[1], C. Gjerakaroska Savevska[1], V. Koevska[1], B. Mitrevska[1], M. Manoleva[1], E. Nikolikj Dimitrova[1], B. Kalchovska Ivanovska[1], D. Gecevska[1]

[1]Univ. Clinic of Physical Medicine and Rehabilitation; Faculty of Medicine, Ss Cyril and Methodius Univ., Skopje, North Macedonia

Gluteus medius calcific tendinopathy is characterized by pain in the lateral aspect of the hip. Radial extracorporeal shock wave therapy (RESWT) has emerged as a potential alternative treatment for this condition. This case report aims to demonstrate the effectiveness of RESWT in managing gluteus medius calcific tendinopathy.
Case report: We present the case of a 40-year-old woman with a three-month history of clicking sensation in the right lateral hip area while walking, accompanied by moderate pain exacerbated by activity and restricted range of motion in the right hip. Despite analgesic use, the pain persisted. The patient had a medical history of postmenopausal osteoporosis. Physical examination revealed tenderness upon deep palpation over the right greater trochanter, with limited hip flexion (80°), extension (10°), external rotation (25°), and abduction (30°), all motions eliciting pain. The Numeric Rating Scale for Pain (NRSP) score was 5 (moderate pain). Plain radiography revealed calcific masses above the greater trochanter. No other significant findings or laboratory abnormalities were noted. Traditional physical modalities failed to alleviate pain and improve hip range of motion, prompting consideration of RESWT as an alternative treatment. The patient underwent four RESWT sessions, each spaced a week apart, involving the application of 2000 shockwaves at a pressure of 2.5 Bar and a frequency of 10 Hz in the painful region around the greater trochanter. Following the fourth RESWT session, hip flexion improved to 110°, with extension, external rotation, and abduction reaching 10°, 40°, and 40° respectively, and the NRSP score decreased to 0 (no pain). At the 3-month follow-up, complete resolution of calcification was observed.
Conclusion: RESWT demonstrated favorable clinical outcomes and complete resolution of radiographic findings in this case of gluteus medius calcific tendinopathy. This suggests that RESWT can serve as a safe and effective alternative treatment, potentially obviating the need for invasive interventions.

P834
SECONDARY FRACTURE IN FRAGILITY FRACTURES OF THE PELVIS

M. H. Hotta[1], K. H. Hotta[1]

[1]Amagi Central Hospital, Fukuoka, Japan

Objective: Fragility fractures of the pelvis (FFP) based on osteoporosis are on the increase. Same as vertebral fractures and proximal femur fractures, FFP have been reported to cause a variety of complications after injury. However, there are few reports of secondary fractures in patients with FFP. In this study, we examined secondary fractures in patients who could be followed for more than 1 y after FFP injury. We report here a study of secondary fractures in patients with FFP who could be followed up for at least 1 y after FFP injury.
Methods: 67 patients who sustained FFP from 2017–2019 and could be followed up for at least 1 y thereafter were included. 58 were female and 9 males, mean age 82.6 y (58–100 y). The study items were BMI, BMD (femur and lumbar spine YAM values), past history of fracture, and presence or absence of osteoporosis treatment. These above items were compared with between with secondary fractures groups and without groups.
Results: Secondary fractures occurred within 1 y of FFP injury in 11 of 67 cases. It occurred in 3 cases of proximal femur fracture, 2 cases of lumbar vertebra fracture, and 1 case each of FFP, patella fracture, distal radius fracture, proximal humerus fracture, distal humerus fracture, and distal femur fracture. Bone density for the femur YAM values was 47.2% and for the lumbar vertebrae was 69.5% in with secondary fractures group and for the femur was 53.4%, for the lumbar vertebrae was 70% in without group. There were no significant differences in any of the parameters. The total number of patients treated for osteoporosis increased from 23 of 67 to 48 of 67 after injury. After the FFP injury, 11 of 10 (91%) of the patients in the with secondary fracture group were treated for osteoporosis. The treatment consisted of bisphosphonates in 5 cases, PTH in 3 cases, and Vitamin D in 2 cases. In the no treatment group, 38 of 56 patients (68%) were treated after injury.
Conclusion: 16% of patients with FFP developed a secondary fracture within one year after injury. In this study, osteoporosis medications had no effect on secondary fracture prevention in patients with FFP. Further study is needed to increase the number of cases and to investigate what kind of medications are used after injury.

P835
REDUCED MUSCLE STRENGTH (DYNAPENIA) AND OBESITY: IMPLICATIONS FOR BONE HEALTH IN TYPE 2 DIABETES MELLITUS PATIENTS

M. Hayon-Ponce[1], B. Garcia-Fontana[2], D. Blanquez-Martinez[3], M. D. Avilés-Perez[2], M. Muñoz-Torres[2]

[1]Universitary Hospital Virgen de las Nieves, Bone Metabolic Unit, Endocrinology and Nutrition Division. Universitary Hospital Clínico San Cecilio, Granada, [2]Bone Metabolic Unit, Endocrinology and Nutrition Division. Universitary Hospital Clínico San Cecilio, Granada, [3]Pharmacy Hospitality Division. Universitary Hospital Ceuta, Ceuta, Spain

Objective: To examine bone health parameters [by DXA and TBS] and muscle strength (by hand grip) in T2DM patients.

Methods: Cross-sectional observational study. 60 T2DM patients (60% males and 40% postmenopausal women) aged 49–85 y. Anthropometric and metabolic parameters were determined. BMD of the lumbar spine (LS), femoral neck (FN) and total hip (TH) and TBS were assessed using DXA and TBS iNsight Software. Hand grip strength (kg/cm^2) was measured with a jamar® hydraulic hand dynamometer (5030j1; jackson, MI). Handgrip strength < 30 kg (male) or < 20 kg (female) was defined as low muscle strength. Data were analysed using SPSS 25.0.
Results: 60 patients with T2DM were studied. Mean age of T2DM patients was 66.3 ± 8.31 years. Mean HbA1C was $7.7 \pm 1.1\%$. 73.3% had poorly glycemic control (HbA1c $> 7.5\%$). 95.8% of female and 91.7% of male had low muscle strength. Hand-grip strength was positively correlated with TBS ($R = 0.321$, $p < 0.01$) and with TH- BMD ($R = 0.268$, $p < 0.05$).
Conclusion: The reduction of muscle strength was significantly associated with decreased bone mass and deteriorated bone microarchitecture in T2DM patients.

P836
RELATIONSHIP BETWEEN BONE PARAMETERS AND SEX HORMONE BINDING GLOBULIN IN TYPE 2 DIABETES MELLITUS PATIENTS

M. Hayon-Ponce[1], B. Garcia-Fontana[2], D. Blanquez-Martinez[3], M. D. Avilés-Perez[2], M. Muñoz-Torres[2]

[1]Universitary Hospital Virgen de las Nieves, Bone Metabolic Unit, Endocrinology and Nutrition Division. Universitary Hospital Clínico San Cecilio, Granada, [2]Bone Metabolic Unit, Endocrinology and Nutrition Division. Universitary Hospital Clínico San Cecilio, Granada, [3]Pharmacy Hospitality Division. Universitary Hospital Ceuta, Ceuta, Spain

Objective: The effects of SHBG in diabetic bone fragility are complex and incompletely known. Our aims was to examine bone health parameters [by DXA and TBS] and sex hormone binding globulin (SHBG) in T2DM patients.
Methods: Cross-sectional observational study in 137 T2DM patients (49–85 y). BMD of the lumbar spine (LS), femoral neck (FN) and total hip (TH) and TBS were assessed using DXA and TBS iNsight Software. Serum SHBG were determined by electrochemiluminescence immunoassay analyser (ECLIA) (Roche Elecsys 1010/2010).
Results: 137 T2DM patients, mean age 65.2 ± 7.5 y (58% male and 42% postmenopausal women). SHBG was negatively correlated with LS-BMD in females ($r = -0.282$; $p = 0.032$), while showed a positive association between serum SHBG and TBS in males ($r = 0.299$;$p = 0.013$) and females ($r = 0.376$; $p = 0.005$).Significantly higher values of TBS were observed in patients with SHBG values above the median in both men ($p = 0.022$) and women ($P = 0.004$).BMD at LS, FN and TH was lower in women with above-median SHBG levels, although the relation was not statistically significant. In men, the same trend was observed except for LS-BMD. The SHBG values showed a progressive increase according to the BMD categories "normal bone mass, osteopenia and osteoporosis" with the highest SHBG levels in women with osteoporosis. The prevalence of low bone mass (T-score < -1) in postmenopausal women showed an increased trend with the increase in SHBG quartiles. No clear trend was found in SHBG values in terms of DXA classification nor in the proportion of low bone mass according to SHBG quartiles in men.
Conclusion: Low SHBG could be a risk factor of degraded TBS. Our findings suggest that SHBG could play a role in the modulation of bone microarchitecture in T2DM patients although how SHBG is involved in diabetic bone and fractures remains unclear.

P837
PERSONALIZED ASSESSMENT OF VITAMIN D STATUS BY A NOVEL METABOLIC APPROACH

M. Herrmann[1], S. Zelzer[1], E. Cavalier[2], M. Kleber[3], C. Drexler-Helmberg[4], P. Schlenke[4], P. Curcic[1], H. Keppel[1], D. Enko[1], H. Scharnagl[1], S. Pilz[5], W. März[1]

[1]Medical Univ. of Graz, Clinical Institute of Medical and Chemical Laboratory Diagnostics, Graz, Austria, [2]Univ. of Liege, Dept. of Clinical Chemistry, Liege, Belgium, [3]Dept. of Internal Medicine 5 (Nephrology, Hypertensiology, Endocrinology, Diabetology, Rheumatology), Mannheim Medical Faculty, Univ. of Heidelberg, Mannheim, Germany, [4]Medical Univ. of Graz, Dept. for Blood Group Serology and Transfusion Medicine, Graz, Austria, [5]Medical Univ. of Graz, Dept. of Internal Medicine, Division of Endocrinology and Diabetology, Graz, Austria

Objective: Determining 25-hydroxyvitamin D (25(OH)D), 24,25-dihydroxyvitamin D ($24,25(OH)_2D$) and the vitamin D metabolite ratio (VMR) allows the identification of individuals with functional vitamin D deficiency. Here we evaluated whether or not such a functional approach provides superior diagnostic information to serum 25(OH)D alone.
Methods: 25(OH)D), $24,25(OH)_2D$ and VMR were determined in participants of the DESIRE (Desirable Vitamin D Concentrations, n = 2010) study and the LURIC (Ludwigshafen Risk and Cardiovascular Health, n = 2456) study. Functional vitamin D deficiency was defined by a $24,25(OH)_2D$ concentration < 3 nmol/L and a VMR $< 4\%$. PTH and bone turnover markers were measured in both cohorts, whereas 10-y mortality data was recorded in LURIC only.
Results: The median age in DESIRE and LURIC was 43.3 and 63.8 y, respectively. Median 25(OH)D concentrations were 68.0 nmol/L and 38.8 nmol/L, respectively. Serum 25(OH)D deficiency with < 50 nmol/L was present in 483 (24.0%) and 1701 (69.3%) participants of DESIRE and LURIC, respectively. In contrast, only 77 (3.8%) and 521 (21.2%) participants, respectively, had functional vitamin D deficiency. Regardless of the serum 25(OH)D concentration, the presence of functional vitamin D deficiency was associated with significantly higher PTH, accelerated bone metabolism and higher all-cause mortality than in the absence of functional deficiency.
Conclusion: The personalized assessment of vitamin D status using a functional approach, better identifies patients with accelerated bone metabolism and increased mortality than the use of a fixed 25(OH)D cut-off of 50 nmol/L.

P838
RISK FACTORS FOR OSTEOPOROSIS IN MONGOLIAN OUTPATIENTS: A CROSS-SECTIONAL STUDY

M. Jaalkhorol[1], D. Amarsaikhan[1], N. Khaidav[1], O. Dulamsuren[1], E. Radnaa[2], A. Khairat[1], G. Davaadorj[3], D. Munkhbayar[4], B. Baigabyl[5], O. Bold[5]

[1]Univ. of National Medical Sciences, [2]Buyant Onoshilogoo Hospital, [3]Amgalan Maternity Specialized Hospital, [4]Mongolian National Univ., [5]National Center for Communicable Diseases, Ulaanbaatar, Mongolia

Objective: Osteoporosis is a major non-communicable disease and the most common bone disease worldwide, affecting one in three women and one in five men over the age of 50. To investigate risk factors for osteopenia and osteoporosis of outpatients in central and suburban district hospitals in Ulaanbaatar.
Methods: The study was conducted using cross-sectional analysis and included 157 participants (124 females, 33 males) over age 40. Outpatients completed a questionnaire on their lifestyles, clinical

information, and measurement BMD within 30–40 min from September 2023 to November 2023. BMD of both hands was measured by DXA. The prevalence of osteoporosis was defined using WHO criteria. Multivariate logistical regression analyses were used to identify osteoporosis predictors.

Results: The study involved 157 outpatients, with an average age of 56.61 ± 11.16. Of the subjects, 59 (37.6%) had normal, 51(32.5%) had osteopenia, and 47(29.9%) had osteoporosis. Age, BMI, and height loss of more than 4 cm were significantly associated with osteoporosis in females and males. Also, comorbidity (rheumatoid arthritis, digestive tract disease) was significantly associated with osteoporosis in both genders. However regular exercise, alcohol consumption, and smoking status were not significantly associated with osteoporosis. After adjusting for age, odds ratios (OR) for osteoporosis remained significantly associated with BMI in both genders (OR, 2,80; p = 0.001; 95%CI (1,19–6,56). However, rheumatoid arthritis (OR, 0,63; p = 0.427; 95% Cl (0,21–1,92), digestive tract disease (OR, 0,50; p = 0.368; 95% Cl (0,11–2,24), and height loss of > 4 cm (OR, 0,43; p = 0.107; 95% Cl (0,16–1,19) had not a significant effect on osteoporosis in participants.

Conclusion: Osteoporosis is associated with the BMI of men and women in Mongolian outpatients. Therefore, these findings provide epidemiological evidence for the early intervention of osteoporosis in patients.

P839
HAND GRIP STRENGTH IN PATIENTS WHO DIAGNOSED WITH TYPE 2 DIABETES MELLITUS IN MONGOLIAN FAMILY HEALTH CENTER

M. Jaalkhorol[1], E. Jamsranjav[1], E. Radnaa[2], B. Bat-Orgil[3], G. Ochirdorj[1], O. Bold[4]

[1]Univ. of National Medical Sciences, [2]Buyant Onoshilogoo Hospital, [3]Singapore School, [4]National Center for Communicable Diseases, Ulaanbaatar, Mongolia

Objective: Despite the many clinical studies in Mongolia, no study has measured the hand grip strength (HGS) of citizens diagnosed with diabetes mellitus. The present study aimed to measure the HGS of people diagnosed with type 2 diabetes mellitus (T2DM) at family health centers in Ulaanbaatar city.

Methods: The study was conducted using a cross-sectional survey and included 347 participants over age 40 who had T2DM in the family health center. Hand grip strength was measured using a digital dynamometer (TKK-5101; Takei Scientific Instruments, Tokyo, Japan). HGS was measured by a handheld dynamometer with maximum effort; two attempts were made with each hand. HGS was defined according to the Asian Working Group for Sarcopenia (AWGS) criteria as low handgrip strength (< 18 kg for females). Relationships between variables were assessed by Pearson's linear correlation coefficient.

Results: We recruited 347 participants whose mean age was 59.87 ± 8.93 y. 59.9% (n = 208) of the participants were women and 40.1% (n = 139) were men. 81.3% of the participants had hypertension, 42.1% had cardiovascular disease, 36.0% had ophthalmic disease, 28.2% had kidney disease, and 26.8% had rheumatoid arthritis. By age group, the grip strength of the right hand in men was the highest in the 40–49 age group (32.23 ± 9.33 kg), while in women the highest was in the 40–49 age group (20.66 ± 5.62 kg). The median male grip strength of the participants was 30.5 kg, with a minimum value of 9 kg and a maximum value of 53 kg, while the average left-hand grip strength was 28 kg, with a minimum value of 2.5 kg and a maximum value of 50 kg. Age and diabetic variables were significantly correlated with handgrip strength in male patients (r = 0.237, p < 0.001). A strong positive correlation was found in females between handgrip strength and pregnancy diabetes (r = 0.865, p < 0.001). Also type 2 diabetes duration, occurrence of leg ulcer and rheumatoid arthritis, and handgrip strength were significantly associated.

Conclusion: The average hand grip strength of both hands significantly differed between age groups, decreasing with age. There were significant sex differences in HGS within each age group, favoring men.

P840
BARRIERS TO IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE ALGORITHM INTO ROUTINE CLINICAL CARE: EXPERIENCES ACROSS 5 NHS TRUSTS IN THE UK

M. K. Javaid[1], D. D. G. Chappell[2], J. Turton[3], J. Boylan[3], J. Threlkeld[4], M. Page[4], M. Sampson[5], Y. Arlachov[6], C. Chisholm[4], R. Eckert[7], E. M. Curtis[8], K. E. S. Poole[2], O. Shalem[9], Y. Kimmel[9], M. Stone[3], R. Pinedo-Villanueva[1], S. Opinder[10]

[1]Univ. of Oxford, NDORMS, Oxford, UK, [2]Cambridge Univ. Hospitals NHS FT, Dept. of Rheumatology, Cambridge, UK, [3]Cardiff and Vale Univ. Health Board, Cardiff, UK, [4]Bradford Teaching Hospitals NHS Foundation Trust, Bradford, UK, [5]Univ. Hospitals Southampton NHS Foundation Trust, Southampton, UK, [6]Nottingham Univ. Hospitals NHS Trust, Nottingham, UK, [7]Oxford Univ. Hospitals NHS Foundation Trust, Oxford, UK, [8]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton, UK, [9]Nanox AI, Neve Ilan, Israel, [10]Univ. of Nottingham, Dept. of Geriatric Medicine, Nottingham, UK

Objective: Artificial intelligence systems are being used to improve Fracture Liaison Services' identification of patients at very high fracture risk. We describe the governance steps to implement such systems in the UK public healthcare system.

Methods: Five NHS hospitals were selected for the implementation of the Nanox AI solution, which identifies vertebral fractures using existing CT images. A lead clinician in each hospital collaborated with Nanox AI and the University of Oxford to secure both information governance (IG) approval and IT support.

Results: The interval from project start to IG agreement varied from 5 to 13 months. The time from IG agreement to first patient scan analysed was 7 to 12 months with one site still in progress. Each site required a unique set of IG documents: Data Protection Impact Assessment (5/5 sites); Data Protection Agreement (2/5 sites), Digital Technology Assessment Criteria (2/5 sites) as well as other forms (Table). The content for each form varied between sites despite a single NHS template. A pre-installation IT form was sent for completion. IT delays were due to various reasons including working with 3rd party suppliers, availability of NHS IT staff and local capability to generate automatic forwarding rules.

Table. Time to approval & IG forms required by each hospital

Timelines	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E
Date of collaboration agreement	03/23[1]	04/22	04/22	04/22	04/22
Date of DPIA sign off	05/23	09/22	03/23	05/23	10/22
Time from collaboration sign off to local DPIA approval (months)	13[1]	5	11	13	6
Date of first patient forwarded and analysed	12/23	09/23	12/23	TBD	11/23
Time from IG approval to first patient analysed (months)	7	12	9	>8	13
DPIA	X	X	X	x	x
DPA			X	x	
DTAC		X			x
IG checklist application		X			
Clinical risk management Plan		X			x
Clinical risk management System		X			x
Clinical safety Case Report		X			x
Clinical safety Hazard Log		X			x
System level security template		X			
Third-party checklist contractor		X			
Cloud computing risk assessment			x		
Firewall request form			x		
Information security toolkit			x		
International Data Transfer Agreement			x		
Due diligence form				x	
Additional services request				x	
Caldicott approval form					x

DPIA- Data Protection Impact Assessment; DPA- Data Protection Agreement; DTAC- Digital Technology Assessment Criteria

[1]Hospital A did not sign the collaborative agreement until all documents were ready and so the time from the collaborative agreement to DPIA was set from April 2022.

Conclusion: Despite having a single NHS provider for England and Wales and prioritisation of AI, there is considerable variability in the types of IG forms required, IT capacity and capability that prolonged AI implementation. Consideration should be given to a single point of IG approval and central IT resources to optimise AI adoption in the NHS.

P841
REAL-WORLD PERFORMANCE OF AI ENABLED VERTEBRAL FRACTURE (VF) ALGORITHM FOR FRACTURE LIAISON STUDIES: THE ADOPT STUDY

D. D. G. Chappell[1], J. M. Brown[1], V. Sanders[1], J. M. Boylan[2], J. Turton[2], J. Threlkeld[3], M. Sampson[4], M. K. Javaid[5], E. M. Curtis[6], C. Chisholm[3], E. L. Gerety[1], R. Eckert[5], K. E. S. Poole[1], M. Stone[2], N. Harvey[6], T. Santos[4]

[1]Cambridge Univ. Hospitals NHS FT, Cambridge, [2]Cardiff and Vales Univ. Health Board, Cardiff, [3]Bradford Teaching Hospitals NHS FT, Bradford, [4]Univ. Hospitals Southampton, Southampton, [5]NDORMS, Univ. of Oxford, Oxford, [6]MRC Lifecourse Epidemiology Centre, Univ. of Southampton, Southampton General Hospital, Southampton, UK

Objective: Fewer than 30% of vertebral fragility fractures (VFs) present on routine clinical CT scans are reported. As VFs identify patients are often at very high fracture risk, improved identification would lead to a major improvement in FLS performance and clinical impact. We aimed to describe the real-world performance of the Nanox-AI model for VF detection.

Methods: 500 consecutive CT scans were retrieved by 4 sites from 2017 that included imaging of the spine. All patients were assessed for VFs from sagittal imaging by a clinician with local radiologist adjudication. For each scan, the clinician recorded if a VF was present, were VF(s) mentioned in the clinical report and did the clinical report use the term 'vertebral fracture'. These findings were compared with the outputs from the Nanox-AI model at the 'high specificity' (1 site) and 'balanced' (3 sites) settings.

Results: The scans for 2000 patients (49.7% women) were audited from 4 sites. A total 255 (12.8%) VF patients were identified by the local clinical reader. Radiology reports had a sensitivity of 51% and specificity of 100% compared with sensitivity of 79% and specificity of 81.2% in 'balanced' sites and sensitivity of 48.3% and specificity of 98.5% in 'high specificity' site. When comparing scan types, the prevalence of VFs varied from 9.7% for CT pulmonary angiogram to 42.7% for CT abdomen and pelvis. Between hospitals, the prevalence of vertebral fractures varied from 5 to 17%.

Conclusion: A clinically significant care gap remains if sites rely on radiology reporting to identify vertebral fractures. In the real-world setting, opportunistic VF reporting in CT using the Nanox-AI model identified an additional 22.5 patients per 1000 patient scans analysed with important differences by AI setting, scan type and hospital.

P842
BODY COMPOSITION, INFLAMMATION (CRP), AND VITAMIN D STATUS IN MORBIDLY OBESE PATIENTS UNDERGOING BARIATRIC SURGERY: PRELIMINARY RESULTS

M. K. P. Kardum Pejić[1], S. C. A. Cvijetić Avdagić[2], J. P. Pejić[1], M. B. Bituh[3]

[1]Univ. Hospital Dubrava, [2]Institute for Medical Research and Occupational Health, [3]Univ. of Zagreb Faculty of Food Technology and Biotechnology, Zagreb, Croatia

Objective: Obesity is one of the fast growing diseases in the modern world with far-reaching for individuals and societies. Bariatric surgery has become the method of choice for weight loss in severely obese patients. The association of body composition (BC) parameters with the level of vitamin D and C-reactive protein (CRP) as a marker of inflammation were investigated.

Methods: 12 patients (7 women and 5 men) who are being prepared for bariatric treatment were included. During the preparation for the operation, they were put on reduction diet. BC (bone, lean and adipose tissue) was determined by DXA. The measured parameters were: fat mass (FM; % of body weight), android (A) and gynoid (G) fat mass (% of FM) yielding A/G ratio, lean mass (LM; % of body weight), BMD (g/cm^2) yielding T-score. Serum vitamin D (nmol/L) and CRP (mg/L) were analysed and grip strength (lbs.) of both hands was measured. Statistical analyses were performed using nonparametric methods.

Results: The mean age of patients was 41.8 $\pm$ 13.2 y and the mean BMI (kg/m^2) was 43.3 $\pm$ 7.3. One women were in postmenopause. Seven patients (58.3%) had vitamin D deficiency (< 50 nmol/L), while five patients (41.7%) had increased CRP. Women had significantly higher T-score ($p = 0.006$), FM% ($p = 0.009$) and gynoid% ($p = 0.005$) compared to men. Men had significantly higher LM% ($p = 0.045$) and A/G ($p = 0.003$) than women. Significant positive correlation was found between FM% and CRP ($p = 0.049$). Regression analyses showed that, when controlling for age and BMI, CRP and T-score were significant positive predictors of FM% ($p < 0.001$ both). CRP was significant negative predictor of BMD, while grip strength and A/G were significant positive predictor of BMD ($p < 0.001$ both).

Conclusion: In patients treated for morbid obesity, CRP as a marker of inflammation, was significantly associated with higher FM% and lower BMD. In our group of obese patients women had higher BMD than men.

P843
LEVEL OF AWARENESS ABOUT OSTEOPOROSIS IN POSTMENOPAUSAL WOMEN

M. Koroleva[1], M. Letaeva[1], O. Malyshenko[1], J. Averkieva[1]

[1]Kemerovo State Medical Univ., Kemerovo, Russia

Objective: To assess the level and nature of awareness about osteoporosis in postmenopausal women.
Methods: A cross-sectional study was conducted using a questionnaire among postmenopausal women. 150 people took part in the study. The average age of the participants was 66.8 [57.4;73.8] y. The criteria for non-inclusion in the study were: the presence of serious illnesses that could affect the quality of filling out the questionnaires, the refusal or inability of the patient to participate in the questionnaire survey. We aimed to assess awareness of osteoporosis, a questionnaire was developed that includes anthropometric data, information about heredity, lifestyle, bad habits and other risk factors, as well as knowledge about osteoporosis and its prevention.
Results: Most of the women surveyed lead an active lifestyle and engage in physical activity at least 30 min/d (112 people—74.7%). 88.0% of women (132 people) consume milk and dairy products as a source of calcium, 50% additionally take calcium supplements (75 people). It should be noted that only 36.0% of respondents (54 people) take vitamin D supplements. The presence of bad habits, such as smoking and drinking alcohol, was noted by 26.0% and 12.7% of women, respectively. 24.0% of respondents (36 people) have a family history of osteoporosis. A decrease in height by more than 3 cm was noted as one of the symptoms of osteoporosis by 20.7% of respondents (31 people). Only 28.0% of patients (42 people) reported frequent falls, while every third woman has low-traumatic fractures in adulthood (48 people—32.0%). In general, every second woman has 2 or more risk factors for osteoporosis (52.0% of people). The majority of survey participants know what osteoporosis is (112 people—74.7%), but have no idea about the risk factors for AP (120 people—80.0%). 42.0% of women (63 people) are aware of the role of vitamin D in prevention and treatment.
Conclusion: About half of postmenopausal women have 2 or more risk factors for osteoporosis. Based on the results of the survey, a low level of awareness about risk factors and measures to prevent osteoporosis was revealed.

P844
STATE-OF-THE-ART IN HYPOPHOSPHATASIA: RECENT RECOMMENDATIONS FROM INTERNATIONAL WORKING GROUPS

M. L. Brandi[1]

[1]Fondazione FIRMO and Observatory for Fragility Fractures, Florence and Univ. San Raffaele, Milan, Florence, Italy

Hypophosphatasia (HPP) is an inborn error of metabolism caused by reduced or absent activity of the tissue non-specific alkaline phosphatase (TNSALP) enzyme, resulting from pathogenic variants in the ALPL gene. Clinical presentation of HPP is highly variable, including lethal and severe forms in neonates and infants, a benign perinatal form, mild forms manifesting in adulthood, and odonto-HPP. Diagnosis of HPP remains a challenge in adults, as signs and symptoms may be mild and non-specific. Disease presentation varies widely; there are no universal signs or symptoms, and the disease often remains underdiagnosed or misdiagnosed, particularly by clinicians who are not familiar with this rare disorder. The absence of diagnosis or a delayed diagnosis may prevent optimal management for patients with this condition.

The diagnosis of hypophosphatasia (HPP) is made on the basis of integrating clinical features, laboratory profile, radiographic features of the condition, and DNA analysis identifying the presence of a pathogenic variant of the tissue nonspecific alkaline phosphatase gene (ALPL). Often, the diagnosis of HPP is significantly delayed in both adults and children, and updated diagnostic criteria are required to keep pace with our evolving understanding regarding the relationship between ALPL genotype and associated HPP clinical features.

No formal diagnostic guidelines currently existed before for the diagnosis of this condition in children, adolescents, or adults. The International HPP Working Group is a comprised of a multidisciplinary team of experts from Europe and North America who have expertise in the diagnosis and management of patients with HPP.

Following consensus meetings, agreement was reached regarding the major and minor criteria that can assist in establishing a clinical diagnosis of HPP in adults and children.

These results will be presented and discussed at the WCO meeting.

P845
MODIFIABLE RISK FACTORS FOR OSTEOPOROSIS IN YOUNG PEOPLE

M. Letaeva[1], M. Koroleva[1], J. Averkieva[1], O. Malyshenko[1]

[1]Kemerovo State Medical Univ., Kemerovo, Russia

Objective: To evaluate modifiable risk factors for osteoporosis (OP) in young people.
Methods: A one-stage continuous study to study modifiable risk factors (RF) for OP included 543 people, of whom 147 (27.1%) were men and 396 (72.9%) women. The average age was 20.4 [19.0; 21.0] years. To assess the RF for OP, a questionnaire was developed that included questions on nutrition, lifestyle, physical activity, bad habits, history of low-energy fractures, and long-term immobilization.
Results: The survey revealed the following frequency of occurrence of RF for OP: 231 (42.5%) people had one risk factor, 172 (31.7%) people had two, 94 (17.3%) people had three, 42 (7.7%) people—four. Thus, on average, 1.8 RF were identified per respondent. In this study, the majority of respondents (440 (81.1%) people) were found to have insufficient dietary calcium intake. It was found that the average amount of calcium per day from all products was 684.97 ± 109.6 mg, which corresponds to 68.5% of the age norm.
Conclusion: The high prevalence of modifiable RF in young people, which undoubtedly indicates the need for preventive measures to prevent the development of OP and its complications in the future.

P846
ANALYSIS OF THE EFFICACY OF MINIMALLY INVASIVE INTERNAL FIXATION TO PROTECT THE PRONATOR QUADRATUS MUSCLE IN THE TREATMENT OF DISTAL RADIUS FRACTURES

M. Li[1]

[1]Dept. of Orthopaedics, the First Affiliated Hospital of Xi'an Jiaotong Univ., Xi'an, China

Objective: To investigate the curative effect of pronator quadrates protecting minimally invasive internal fixation in treating distal radius fracture.

Methods: Pronator quadrates protecting minimally invasive internal fixation was applied to treat 43 cases of distal radius fractures, and functions of wrist joints were evaluated by aid of Dienst function evaluation table; functions of wrist joints on the uninjured side and the affected side were compared to analyze the curative effect of minimally invasive internal fixation three months after the surgery.
Results: The results of recovery of wrist joint functions evaluated via the Dienst function evaluation table show that there were excellent 38 cases, 4 good cases, 1 qualified case and 0 poor case, with the rate of excellent and good cases reaching 97%. With respect to comparison in the movement of wrist joints on the uninjured side and the affected side (Dorsiflexion $70.2 \pm 1.1°$ vs. $68.2 \pm 2.1°$; palmar flexion $72.1 \pm 3.6°$ vs. $70.2 \pm 4.7°$; radial deviation $20.5 \pm 1.2°$ vs. $19.9 \pm 3.2°$; ulnar deviation $33.6 \pm 5.4°$ vs. $31.2 \pm 2.0°$; pronation $79.5 \pm 4.6°$ vs. $76.2 \pm 2.7°$; supination $78.2 \pm 6.2°$ vs. $75.2 \pm 2.0°$), there was no statistical difference ($P < 0.05$).
Conclusion: Pronator quadrates protecting minimally invasive internal fixation has a positive meaning for the treatment of distal radius fractures. In addition to shortening the operation time and reducing postoperative complications, pronator quadrates protecting minimally invasive internal fixation can also reduce the probability of fracture nonunion, retain the rotation function of patients' forearms to the largest extent, and help patients do functional exercise in the early phase.

P847
PAMIDRONATE USE FOR PAIN IN NON-MALIGNANT NORMOCALCEMIC CONDITIONS

M. Lovy[1]

[1]Desert Oasis Healthcare, Palm Springs, California, USA

Objective: To describe a cohort of patients with painful conditions affecting the bone and the role of pamidronate in their management.
Methods: A chart review of patients who had received intravenous pamidronate for pain control in an outpatient rheumatology and osteoporosis unit over a 7-y period.
Results: The conditions and number of patients receiving varying doses of intravenous pamidronate included: subacute vertebral compression fracture-324, pelvic fracture-62, post radiation pelvic fracture-3, bone marrow edema of the knee-14, bone marrow edema of the ankle-2, reflex sympathetic dystrophy-3, midfoot osteoarthritis-2, scleroderma with massively draining subcutaneous calcification-1, Erdheim-Chester disease-1, histiocytosis-1, Modic deformity-1. The response of pain to pamidronate in subacute vertebral compression fracture at two weeks identified patients who were candidates for kyphoplasty. All patients with pelvic fracture improved with pain control and mobility, although some required a second infusion. Pain relief in patients with bone marrow edema was dramatic and occurred in 2–10 d. When bone marrow edema of the knee was associated with moderate to severe osteoarthritis, patients with no response to pamidronate were referred for knee replacement. Patients with late stages of reflex sympathetic dystrophy did not respond to pamidronate. All the conditions with only 1 patient responded dramatically to pamidronate. Several patients had temporary generalized aching, a few had fever and chills associated with aching and 1 patient had an attack of pseudogout. No serious adverse events occurred.
Conclusion: Pamidronate can be useful in treating the pain and immobility associated with a variety of conditions associated with increased bone turnover or blood flow. The response to pamidronate also aided in decision making in patients with subacute vertebral compression fracture and those with bone marrow edema of the knee associated with osteoarthritis.

P848
HYPERCALCEMIA AND RENAL INSUFFICIENCY RELATED TO GRANULOMATOUS DISEASE CAUSING INCREASED LEVELS OF 1,25-DIHYDROXYVITAMIN D SUCCESSFULLY TREATED WITH LEFLUNOMIDE

M. Lovy[1]

[1]Desert Oasis Healthcare, Palm Springs, California, USA

Objective: To report the use of leflunomide for granulomatous disease causing hypercalcemia.
Methods: Chart review of 2 patients with hypercalcemia and renal insufficiency due to granulomatous disease treated with leflunomide.

Results:

Case 1: 63-year-old man presented comatose due to hypercalcemia and renal insufficiency. Malignancy, sarcoidosis, myeloma, and hyperparathyroidism were excluded. Treatment with pamidronate, ketoconazole and steroids lowered the calcium but hypercalcemia recurred necessitating several re-admissions. Rheumatology consultation noted silicone implants of the buttocks and biceps. Laboratory studies showed calcium 13.1 mg/dL, creatinine 3.3 mg/dL, PTH 10 pg/mL (normal 15–65), 25-dihydroxyvitamin D 37 ng/mL (normal 32–100), 1,25-dihydroxyvitamin D 89 pg/mL (normal 15–56). A presumptive diagnosis of silicone induced granulomatous reaction with unregulated increased conversion of 25-dihydroxyvitamin D to 1,25-dihydroxy vitamin D was made. Leflunomide was prescribed and laboratory studies normalized after discharge.

Case 2: 62-year-old man with sarcoidosis, kidney and bladder stones, renal insufficiency and hypercalcemia was referred for treatment. Serum calcium was 11.3 mg/dL, creatinine 3.1 mg/dL, 25-dihydroxyvitamin D 28 ng/mL, 1,25-dihydroxyvitamin D 75 pg/dL, and PTH 7.8 pg/dL, angiotensin converting enzyme 48 U/L (normal 9–67), and 24 h urinary calcium 359. When he did not respond to low dose prednisone, ketaconazole, and chloroquine, leflunomide was added. The calcium normalized and creatinine stabilized at 2.1 mg/dL. When the patient discontinued the leflunomide after 1 year, hypercalcemia recurred and responded to addition of leflunomide alone.
Conclusion: Leflunomide, a pyrimidine synthesis inhibitor, may be effective in controlling hypercalcemia related to granuloma induced hypercalcemia. Since leflunomide is metabolized in the liver it may be the drug of choice in patients with renal insufficiency.

P849
ROMANIAN INCIDENCE TRENDS AND RATE OF CONSERVATIVELY TREATED HIP FRACTURES 2019–2022

M. M. Bartelick[1], I. M. Pascanu[1], A. I. Gasparik[1]

[1]"George Emil Palade" Univ. of Medicine, Pharmacy, Science and Technology of Targu Mures, Targu Mures, Romania

Objective: The SCOPE 2021 scorecard reports that fragility fractures are suspected to increase by 25% annually for all fracture sites (1). In a 2017 Romanian study, 16.41% of hip fractures were managed conservatively with a significant effect on the hazard ratio for mortality (2). The aim of our study was to evaluate proximal hip fracture incidence trends and demographics in patients $\geq$ 40 years old presenting to the emergency department of the Targu Mures County Hospital, as well as the proportions of patients that refused admittance to the orthopedics department for surgical treatment.

Methods: We conducted a retrospective, single-center study using reports of patients ≥ 40 years old that presented to the emergency department between January 1, 2019 and December 31, 2022 with hip fracture (femoral neck fracture, pertrochanteric fracture, subtrochanteric fracture). Patient demographics, time spent in the emergency department and decision of admittance were recorded.
Results: We observed an annual increase in hip fracture rate between 2019–2022, totaling to a 43.8% increase. In 2019, 23.6% of patients refused admission to the orthopedics department. We observed a decrease of admission refusal rate in the following years: 15.6% (2020), 13% (2021), and 12.5% (2022). The proportion of patients that refused admission was significantly greater in those from rural environments and those with femoral neck fractures in 2019 (χ^2 p = 0.046, p = 0.03). 68% of all patients were female with a mean age of 81.5 ± 9.4 y. Males accounted for 32% of all hip fracture cases with a mean age of 76 ± 12 y. We observed that females were significantly older in all years, but no significant age difference was observed between patients of the same gender in the admission vs. refusal group.
Conclusion: Our results show an increase in hip fracture rate similar to a Romanian study conducted between 2008–2018 that evidenced a 41.5% increase nationwide (3). Although rates of conservatively treated fractures decreased between 2019 and 2022, they continue to be higher than the 3.7–6.2% reported in studies from other countries, leading to a poorer prognosis for Romanian patients (4).
References:

1. Kanis JA, et al. Arch Osteoporos 2021;16:82
2. Dobre R, et al. Arch Osteoporos 2021;16:64
3. Grigorie D, et al. Acta Endocrinol (Buchar) 2019;15:505
4. Lee J, et al. Joint Dis Relat Surg 2022;33:17

P850
UNDIAGNOSED VERTEBRAL FRAGILITY FRACTURES IN PATIENTS WITH DISTAL RADIUS FRAGILITY FRACTURES: AN OPPORTUNITY FOR PREVENTION OF MORBIMORTALITY IN OSTEOPOROTIC PATIENTS IN DEVELOPING COUNTRIES

M. M. Muzzammil[1]

[1]Sindh Gov. Services Hospital Karachi, Karachi, Pakistan

Objective: To look into the frequency, location, kind, and severity of asymptomatic vertebral fractures (VF) in people who had fractures of the fragility of the distal radius. Although VF is frequently misdiagnosed, it is linked to higher mortality, morbidity, and hip fracture risk. The study also attempted to investigate the relationship between VF and certain demographic and lifestyle factors, as well as FRAX data, in this patient population.
Methods: Between 2021–2022, individuals with low-energy distal radial fractures who presented to the emergency room were the subject of a cross-sectional study. The thoracic and/or lumbar spine was imaged using radiology, and information on demographics, way of life, and FRAX was gathered. Using the Genant semiquantitative approach, an impartial and blinded orthopaedist identified VF in the images and determined their severity. SPSS version 20 was used to analyse the data.
Results: 211 (41.21%) of them were found to have radiographic VF and Only 12 (2.34%) of the 512 patients who were tested were getting osteoporotic therapy. The thoracic spine (32.7%), followed by the lumbar spine (43.12%), was the area most frequently afflicted. In 24.17% of the patients, multiple fractures of the thoracolumbar spine were found. The wedge form, followed by biconcave and crush, was the most prevalent VF type. The majority of detected VF were rated as having a 25–40% height loss, then severe (> 40%) fractures, according to the Genant grading method. Notably, there were no variations in smoking, drinking, BMI, or FRAX score between patients with and without VF that were statistically significant.
Conclusion: According to the study's findings, osteoporotic vertebral fractures occur in nearly half of individuals with distal radius fractures. The most frequently affected region is the lumbar spine, and wedge fractures are the most typical kind. Due to their high fall risk, these patients need extensive fall risk assessments and the proper treatments to increase their BMD and strength. In this patient population, identifying asymptomatic VF can help with better care and the avoidance of further problems.

P851
REVOLUTIONIZING OSTEOPOROTIC DISTAL RADIUS FRACTURE CARE IN ASIA: TERIPARATIDE'S SWIFT ACCELERATION OF HEALING IN A PIONEERING DOUBLE-BLINDED TRIAL

M. M. Muzzammil[1]

[1]Sindh Gov. Services Hospital Karachi, Karachi, Pakistan

Objective: As the Asian population experiences rapid aging, osteoporosis emerges as a prominent and costly health concern. Distal radius fractures, among the most prevalent fractures, are associated with an elevated risk of subsequent fractures. The swift attainment of union is crucial for the early resumption of daily activities and the mitigation of complications. Although teriparatide has demonstrated efficacy in accelerating fracture healing, there is a dearth of literature on its application in osteoporotic distal radius fractures among the Asian population. This study aims to evaluate the potential of teriparatide in expediting fracture healing.
Method: A double-blinded randomized controlled trial, conducted from January 2015 to June 2019, included patients with extra-articular osteoporotic distal radius fractures managed conservatively with casting. The primary objective was to compare the impact of 8 weeks of once-daily subcutaneous teriparatide (20 μg) vs. a placebo on the time to radiographic healing. Radiographic healing was defined by cortical bridging in three of four cortices, with secondary objectives including the time to healing of four cortices, assessment of anatomic deformity, and functional evaluations. Patients underwent screening on the day of the fracture, followed by randomization, an 8-week treatment period, an 8-week follow-up, and a safety extension for an additional 36 weeks.
Results: Out of 214 screened patients, 202 women were enrolled, with 12 discontinuing before or during treatment. The remaining 202 women were randomly assigned to once-daily placebo (n 107) or 20 mg teriparatide (n 107). The median time to healing was significantly shorter in the teriparatide group (95%CI 2.5 to 0.7 weeks, p.005), with no significant between-treatment differences in secondary objectives. Both groups exhibited significant improvements in pain scores, functional tests, and grip strength compared to baseline.
Conclusion: This study demonstrates that teriparatide (20 μg) accelerates the time to healing in conservatively managed distal radius osteoporotic fractures. Additionally, there were significant improvements in pain scores, functional tests, and grip strength after the 8-week treatment period. This suggests the potential for teriparatide to enhance fracture repair in this population.

P852
CLINICAL CORRELATES OF NUTRITIONAL STATUS AND PONSETI TECHNIQUE SUCCESS IN CLUBFOOT PATIENTS

M. M. Muzzammil[1]

[1]Sindh Gov. Services Hospital Karachi, Karachi, Pakistan

Objective: Malnutrition is a critical health issue, particularly prevalent in developing countries, and is a major risk factor for diseases and mortality in children. Clubfoot or congenital talipes equinovarus (CTEV) is a common form of congenital orthopedic abnormality, and the Ponseti method has become the gold standard for its treatment over the last two decades. The primary objective of this study was to determine the prevalence of malnutrition in clubfoot patients and its impact on the outcome of the Ponseti technique in patients presenting to the Orthopedic Clinic of a tertiary care hospital in Karachi, Pakistan. Additionally, we aimed to assess the correlation between clinical tests, such as CBC, serum albumin levels, serum electrolytes, and nutritional status.
Methods: We conducted a cross-sectional study from January to December 2018, including a total of 153 clubfoot patients. The WHO classification of weight-for-age index was used to assess the nutritional status of patients, and clinical tests were also conducted to evaluate the correlation between malnutrition and the outcome of the Ponseti technique. Statistical analysis was performed with a P value ≤ 0.05 deemed significant.
Results: Of the 153 patients, 121 (74.5%) were in good nutritional status, while 32 (25.5%) were malnourished. The average number of casts required per patient and the proportion of patients requiring 6 or more casts were higher in the malnourished group (45.5 vs. 21.42%). The number of Achilles tenotomy procedures performed in the malnourished group was also higher (76.4 vs. 51.8%). Clinical tests showed a direct correlation between nutritional status and outcomes of the Ponseti technique.
Conclusion: Our study reveals a significant correlation between patients' nutritional status and the outcome of the Ponseti technique. Malnutrition can lead to an increased number of casts required for treatment and a higher likelihood of relapse and failure of treatment. The study also highlights the importance of clinical tests in evaluating the nutritional status of patients and its correlation with the outcomes of the Ponseti technique.

P853
UNVEILING THE BURDEN: VERTEBRAL FRACTURE PREVALENCE AND TERIPARATIDE'S IMPACT ON POSTMENOPAUSAL PATIENTS WITH CHRONIC BACK PAIN IN A DEVELOPING NATION

M. M. Muzzammil[1]

[1]Sindh Gov. Services Hospital Karachi, Karachi, Pakistan

Objective: To investigate the incidence and consequences of vertebral fractures (VF) in postmenopausal individuals experiencing chronic, nonspecific backaches at two tertiary healthcare facilities in Karachi, Pakistan. The escalating prevalence of osteoporosis among the aging Asian population poses a significant health threat, with recurrent fractures often associated with vertebral fractures.
Methods: A cross-sectional examination involved 200 postmenopausal patients aged 45 and older, experiencing persistent, nonspecific back pain during 200 consecutive outpatient visits from June 2020 to December 2022. The study explored the link between prior vertebral fractures and the risk of future fractures in postmenopausal women. Randomly assigned to receive daily placebo or teriparatide as part of the Fracture Prevention Trial (20 g), participants were observed for an average of 24 months.
Results: Among the 200 participants (mean age 65, SD 14.14), 112 individuals (56%) exhibited radiological vertebral fractures. The wedge type was predominant, affecting the thoracic spine (45.53%) and lumbar spine (30.35%). Multiple thoracolumbar spine fractures occurred in 24.10% of cases. Genant's grading identified most fractures as mild. Teriparatide-treated participants showed no significant increase in fracture likelihood, while the placebo group exhibited a higher prevalence of vertebral fractures ($P < 0.001$) and nonvertebral fractures (9%).
Conclusion: This study underscores the heightened risk of vertebral fractures in postmenopausal women with chronic back pain. The number of prior nonvertebral fractures predicts future nonvertebral fractures, and the severity of current vertebral fractures independently forecasts future vertebral fractures. Early detection and treatment of vertebral fractures in this vulnerable population are crucial to mitigate the risk of further fractures and associated morbidity.

P854
TERIPARATIDE INTERVENTION IN STEROID-INDUCED OSTEOPOROSIS: UNVEILING THE PREVALENCE, CHARACTERISTICS, AND THERAPEUTIC IMPACT ON VERTEBRAL FRACTURES

M. M. Muzzammil[1]

[1]Sindh Gov. Services Hospital Karachi, Karachi, Pakistan

Objective: This study explores the prevalence and management of vertebral fractures (VF) resulting from steroid-induced osteoporosis, with a specific focus on the role of teriparatide. We investigate the impact of long-term glucocorticoid therapy on VF, characterize their occurrence, severity, and location, and assess the efficacy of teriparatide in managing these fractures. We aimed to determine the prevalence of asymptomatic vertebral fractures, characterize their location, type, and severity, and evaluate the role of teriparatide in managing fractures in patients on long-term glucocorticoid therapy.
Methods: This cross-sectional study involved screening 415 patients on prolonged steroid therapy for eligibility. Data collection included demographic, lifestyle, and FRAX information, along with radiological imaging of the thoracic and lumbar spine. An independent orthopedist, blinded to patient details, reviewed images for VF and utilized the Genant semiquantitative method for severity quantification. Additionally, the study explored the relationship between prior fractures and the risk of new fractures.
Results: Among the screened patients (mean age 45.3 ± 25.12 y), 65.30% exhibited radiological VF. The thoracic spine (52.02%) was the most affected location, with wedge fractures being the most prevalent type. Teriparatide significantly reduced new VF compared to the placebo group. The study also observed prior fracture healing, as evidenced by reduced pain scores and improved quality of life in the teriparatide group.
Conclusion: This study underscores a high prevalence of VF in patients on long-term glucocorticoid therapy, emphasizing an increased risk of new VF and non-VF. Teriparatide emerges as a promising treatment option, demonstrating greater increases in BMD and significantly fewer new vertebral fractures. The findings suggest teriparatide's potential effectiveness in managing vertebral fractures secondary to steroid-induced osteoporosis, particularly in developing countries.

P855
EMERGENCE OF LEUCOCYTIC EXTRACELLULAR TRAPS IN EARLY RHEUMATOID ARTHRITIS

M. Mamus[1], A. Trofimenko[1], S. Bedina[1], E. Mozgovaya[1], S. Spitsina[1]

[1]Clinical Biochemistry Lab, Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, Russia

Objective: Disease mechanisms underlying induction of autoimmune response to cartilage and synovial antigens, especially their citrullinated modifications are of particular interest by entire rheumatologic community [1]. Extracellular traps of neutrophils and monocytes can be considered as their candidate source. Objective is to perform comparative analysis of extracellular traps generation by circulating monocytes and neutrophils from RA patients and healthy controls.
Methods: 15 adult patients with verified RA, disease history less than 2 years, and DAS28 score not exceeded 2.6 were included in the study. 15 healthy volunteers were included in the control group. Circulating monocytes were isolated using centrifugation of buffy coat over specific density gradient. Neutrophils were isolated with in-house one-step centrifugation procedure using double-layer density gradient. The leucocyte types were identified by light microscopy, and its activation was quantified by NBT test. The generation of monocyte and neutrophil extracellular traps (ETs) was stimulated by PMA. Morphological features of ETs were assessed using fluorescence microscopy with SYBR green. Results are expressed as percent of netting cells in smear. Central tendencies are expressed as means (95%CI).
Results: Mean age of RA patients was 56.2 y, mean disease duration was 1.4 y. Mean purity of monocyte and neutrophil fraction in RA group was 98.8% and 93.3%, respectively, cell viability in every sample was above 97.7% and 95.0%, respectively. Both monocyte and neutrophil fractions exhibiting ETs spontaneously were significantly larger in RA than in control group while ET-producing monocyte fraction was slightly larger than its neutrophil counterpart in RA (8.4 (6.6–12.0)% and 7,7 (5,9–9,5)%, respectively. Induced ET production by both cell types was also significantly higher in RA, being somewhat higher for monocytes comparing to neutrophils.
Conclusion: Substantial growth of ET generation by circulating neutrophils and monocytes has been demonstrated in our research. The obtained data suggest ETs participation in RA pathogenesis presumably through exhibition their citrulline neoepitopes.
Reference: (1) Trofimenko AS, et al. Curr Rheumatol Rev 2021;17:283.

P856
IN VITRO CARDIOLIPIN ANTIBODY REMOVAL IN SLE-ASSOCIATED APS USING SPECIFIC MAGNETIC ADSORBENT PARTICLES

M. Mamus[1], A. Trofimenko[1], O. Emelyanova[1], S. Spitsina[1]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, Russia

Objective: Tissue damage by circulating antiphospholipid antibodies and respective immune complexes is a prominent pathogenetic factor in SLE-associated secondary APS. Due to significant risk of acute exacerbations, including catastrophic APS, development of new extracorporeal autoantibody sorption protocols can be of great practical importance. The objective is assessment of sorption efficiency of circulating anti-cardiolipin antibodies as well as concomitant blood cell damage after in vitro blood perfusion through original immobilized cardiolipin adsorbent.
Methods: Magnetic polyacrylamide beads with immobilized cardiolipin were synthesized beforehand by in-house developed technique [1] and placed in a perfusion microcolumn immediately prior to perfusion procedure. 63 adult patients with verified both SLE and APS were included in the study. Single samples of heparinized blood (50 ml) were obtained during in-hospital treatment of SLE exacerbation, split in half and immediately perfused through the packed column using peristaltic pump at 25 ml/h. Control perfusion was performed through column with activated charcoal. Concentrations of anticardiolipin antibodies were measured by ELISA before and after perfusion. Circulating immune complexes were quantified by PEG precipitation assay.
Results: Mean anti-cardiolipin antibody concentration after perfusion through magnetic polyacrylamide beads with immobilized cardiolipin was 2.77 times lower than initial ones ($p < 0.001$). Mean immune complex concentration decreased from 12.4 ± 1.2 to 4.6 ± 0.5 U ($p < 0.001$). Mean decrease of anti-cardiolipin antibody concentration after perfusion through the charcoal (1.18 times lower) as well as immune complex levels were not significant. Decrease of blood cells after perfusion through the magnetic beads was negligible unlike their counterparts after perfusion through activated charcoal.
Conclusion: Blood treatment by magnetic polyacrylamide beads with immobilized cardiolipin effectively removes highly pathogenic antiphospholipid antibodies and immune complexes from the circulation, preserving blood cells from concomitant damage. These features of the magnetic carrier are particularly significant in APS due to demand for recurrent extracorporeal therapy.
Reference: (1) Gontar IP, et al. An approach for removal of DNA-containing immune complexes from blood using composite sorbent. Patent RU2441674 (2010) [in Russian].

P857
ANALYTICAL PERFORMANCE OF ADVANTAGEOUS ANTI-DNASE I ELISA ASSAY FOR SLE DIAGNOSTICS

M. Mamus[1], A. Trofimenko[1], S. Bedina[1], E. Mozgovaya[1], S. Spitsina[1]

[1]Clinical Biochemistry Lab, Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, Russia

Objective: Routine laboratory markers for SLE verification have insufficiently high diagnostic performance, being based primarily on classical ELISA, IIF or western blotting protocols. Another sound practical disadvantage is relatively high price of all these tests. Development of innovational immunodiagnostic tools as well as searching for new SLE biomarkers is thus of profound practical interest. Our objective is to compare analytical performance of anti-DNase I antibodies quantified by classical ELISA with anti-DNase I assay based on magnetic carrier technology.
Methods: 54 patients with verified SLE and 52 control patients with another rheumatic conditions were analyzed in the study. Common anti-DNase I ELISA protocol was made as published previously [1]. Synthesis of magnetic beads covered with DNase I and modified ELISA with these beads were made as previously described [2]. Antibody levels are indicated as optical density units.
Results: Cutoff points for the regular and upgraded ELISA were 0.061 and 0.057 units, respectively. Average anti-DNase I levels of SLE patients were significantly higher comparing to controls. There were minute differences between average anti-DNase I concentrations measured by two studied protocols in both groups. Sensitivity and specificity of the upgraded ELISA were 65% and 85%, respectively, being coincided almost perfectly with their counterparts obtained by conventional ELISA. LOQs and CVs for two assessed ELISAs were also indistinguishable. Repeatability of two analyzed protocols by means of Bland–Altman plot revealed no substantial divergence

within entire range of concentrations. Accuracy and repeatability of improved ELISA were somewhat higher than for the common approach. Usage of single reactivated magnetic carrier led to characteristics of modified ELISA similar to newly synthesized beads.
Conclusion: Analytical performance of modified anti-DNase I ELISA is virtually equivalent to common ELISA technique, having nevertheless some economic advantages.
References:
1. Trofimenko AS, et al. Rheumatol Int 2016;36:521.
2. Gontar IP, et al. An approach for removal of DNA-containing immune complexes from blood using composite sorbent. Patent RU2441674 (2010) [in Russian].

P858
ANTI-ELASTIN ANTIBODIES AND ITS APPLICABILITY IN SLE DIAGNOSTIC SEARCH

M. Mamus[1], A. Trofimenko[1], O. Emelyanova[1], S. Spitsina[1]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, Russia

Objective: The importance of researching elastin in SLE is determined by its high prevalence as the main protein component of elastic fibers in wide variety of organs and tissues including ligaments, skin, blood vessels. Preserved function of elastic fibers exerts substantial influence on proper performance of cardiovascular and musculoskeletal system. Autoimmune inflammation mediated by specific anti-elastin antibodies is a candidate factor of damage in these tissues needed to be thoroughly studied in SLE. Objective is to analyse clinico-immunological interrelations involving serum anti-elastin antibodies.
Methods: 56 adult patients with verified SLE were included in the study during their in-hospital treatment. We assessed disease activity using ECLAM scale. 30 healthy volunteers were enrolled as controls. Synthesis of magnetic beads covered with elastin and modified ELISA with these beads were made as previously described [1]. Antibody levels are indicated as optical density units. Results were stated as means $\pm$ standard errors, differences were considered significant when $p < 0.05$.
Results: Average age of SLE patients was 42.6 ± 12.1 y. Average ECLAM score was 10.2 ± 6.7 points (from 2 to 28 points). Cutoff value for positive anti-elastin antibody results was calculated to be 0.102 units. 30 (53.3%) SLE patients were found to be anti-elastin positive whereas no positive cases were revealed in control group. Mean concentration of serum anti-elastin antibodies in SLE was 0.138 ± 0.067 units. Skin and vascular involvements are demonstrated to be associated with serum anti-elastin positivity ($p = 0.010$ and $p < 0.001$, respectively). There was positive correlation between the antibody levels and ECLAM score ($r = 0.379$, $p = 0.030$).
Conclusion: Serum anti-elastin antibodies are revealed to be common SLE feature, which depends on disease activity and some clinical manifestations. Tissues having prominent elastin abundance like skin and vessels are thought to be frequently involved in autoimmune inflammation caused by specific anti-elastin antibodies.
Reference: (1) Gontar IP, et al. An approach for removal of DNA-containing immune complexes from blood using composite sorbent. Patent RU2441674 (2010) [in Russian].

P859
QUALITY OF LIFE IN PATIENTS WITH CALCIFYING TENDINITIS OF THE SHOULDER ROTATOR CUFF TREATED WITH EXTRACORPOREAL SHOCKWAVE THERAPY AND CONVENTIONAL PHYSICAL THERAPY

M. Manoleva[1], E. Erieta[1], V. Koevska[1], B. Mitrevska[1], C. Gjerakaroska Savevska[1], M. Gocevska[1], B. Kalcovska[1], D. Gechevska[1], L. Malinovska Nikolovska[2]

[1]Univ. Clinic For Physical Medicine And Rehabilitation, Faculty Of Medicine, Ss. Cyril And Methodius Univ., [2]Acibadem Sistina Clinical Hospital, Dept. of Pediatric Cardiac Surgery, Skopje, North Macedonia

Objective: Calcific tendinitis of the shoulder rotator cuff is a common disorder of unknown etiology. It is commonly treated with various physical treatment modalities where extracorporeal shockwave therapy (ECTUB) is emerging as an effective method. The main objective of this clinical study is to evaluate and compare the quality of life of ECTUB treatment and conventional physical therapy treatment in patients with calcific tendinitis of the shoulder rotator cuff.
Methods: The research was a prospective, monocentric clinical study that included 80 patients with calcific tendinitis of the shoulder rotator cuff who were divided into two groups: group 1 (study group), 40 patients who received ECTUB, 5 treatments were applied, once a week, with continuous frequency, pressure 3.0 Bar, frequency 12 Hz, number of strokes—3000, duration of treatment 7 min; and group 2 (control group), 40 patients who received conventional physical treatment, ultrasound therapy with an intensity of 0.5 W on an area of 1 cm^2, for 5 min, and diadynamic currents, for a duration of 3 weeks, every working day, namely 15 treatments of therapeutic ultrasound and 10 treatments of diadynamic currents. Both groups performed shoulder exercises simultaneously with the physical treatment. The efficacy of the treatment was evaluated using the Questionnaire for quality of life in patients with shoulder rotator cuff disease (RC-QOL). Clinical findings were evaluated at the same time in four time points for patients in both groups: before starting physical therapy, immediately after the end of the therapy, after the third and the sixth month after starting physical therapy.
Results: All patients after the treatment had statistically significantly better results in the both groups in the RC-QOL, but according to the obtained results, based on the scores of the RC-QOL scale, patients in the study group at the end of follow-up, i.e., 6 months after the start of treatment, had a significantly better quality of life than patients in the control group.
Conclusion: ECTUB is a safe and noninvasive treatment that improves quality of life in patients with calcifying tendinitis of the shoulder rotator cuff.

P860
ANTINUCLEAR ANTIBODY IN RHEUMATOID ARTHRITIS

M. Masko[1]

[1]Vitebsk State Medical Univ., Vitebsk, Belarus

Objective: Antinuclear antibodies (ANA) or anti-cellular (ACA) are a heterogeneous group of autoantibodies directed against various cellular antigens. ANA positivity is noted in many autoimmune diseases, and can be concern as universal test in the examination of patients with autoimmune pathology. The aim of work was to assess

by indirect immunofluorescence (IIF) the incidence and types of ANA in patients with rheumatoid arthritis (RA) and to evaluate their diagnostic value.
Methods. In the study were included 270 patients, which fulfill EULAR/ACR 2010 criteria for RA and 50 healthy controls. The mean of patients age was 52.80 y (95%CI: 51.70–54.80 y). Levels of antibodies to anti-CCP were evaluated by ELISA according to the instructions of the manufacturer (Euroimmune, Germany). Levels of rheumatoid factor (RF) were assessed by kinetic nephelometry using an automatic analyzer Beckman Coulter (USA). The presence of ANA was determined by IIF on the automated system AKLIDES (Medipan, Germany). In samples with a positive ANA result, antibodies to specific nuclear antigens (SS-A 52, SS-A 60, SS-B, ds-DNA, CENP-B, Sm, RNP/Sm) were determined on the platform AKLIDES Cytobead.
Results: Anti-CCP in patients were found 209 (77.41%) patients, RF in 192 (71.11%) patients, ANA in 99 (36.67%) patients. The incidence of anti-CCP, RF and ANA in RA was significantly higher than in healthy individuals ($p < 0.05$). Speckled pattern was the most frequent. Positive results of determination of specific autoantibodies to at least 1 nuclear antigen were found in 39.47% of ANA-positive patients. Antibodies to SS-A60 antigen (31.57% of patients) were the most common in RA, other autoantibodies were found with a lower incidence. We analyzed by ROC – analysis the possibility of ANA test to discriminate seronegative by anti-CCP and RF RA patients from healthy controls. The diagnostic sensitivity was 54.55% (95%CI: 23.5–83.1%), specificity was 100.00% (95%CI: 88.7–100.0%), area under ROC curve was 0.773; 95%CI: 0.617–0.887, $p = 0.0026$). There were no significant differences in clinical (DAS 28, CDAI, SDAI, treatment options) and laboratory characteristics (ESR, CRP, anti-CCP, RF levels) between ANA-positive and ANA-negative patients ($p > 0.05$). However, systemic manifestations were observed three times more often in ANA-positive RA (31.57 vs. 8.95%, $p = 0.0073$).
Conclusion: ANA occurs in a third of patients with RA, indicating the intensity of autoimmunity in RA. ANA may serve as additional laboratory biomarker for seronegative RA to allow to close the seronegative RA gap. Standardized evaluation of ANA by IIF allows to obtain comparable data without the influence of subjective factors, which greatly simplifies the research of ANA as a diagnostic and prognostic biomarker in RA.

P861
DOES BARIATRIC SURGERY CHANGE PHYSICAL PERFORMANCE AND FUNCTIONAL STATUS?

M. Małek[1], K. Piotrowicz[1], J. Gąsowski[1], M. Fedyk-Łukasik[1], A. Rudzińska[1], P. Major[2], B. Gryglewska[1]

[1]Dept. of Internal Medicine and Gerontology, Jagiellonian Univ. Medical College, [2]2nd Dept. of General Surgery, Jagiellonian Univ. Medical College, Kraków, Poland

Objective: To assess changes in functional status, muscle strength and physical performance in patients 6 months after bariatric surgery.
Methods: In 77 patients, before and six months after bariatric surgery, we collected basic demographic data, information on the components of the SARC-F, administered the Global Physical Activity Questionnaire (GPAQ) and performed basic anthropometric measurements. We assessed muscle strength in both the dominant and nondominant hand (HGS) and with the five times sit-to-stand test (5xSTS); physical performance was assessed with the usual gait speed (GS) test. In groups divided by sex and age (< 50 y and 50 + y), the Wilcoxon signed rank test was used for data with nonstandard distributions and the paired t-test for data with standard distributions (SPSS 9.0).
Results: Mean (SD) age was 41.0 (10.6) y, 68.8% women; median (Q1-Q3) BMI before surgery was 41.5 (39.5–46.1) kg/m^2. Significant decreases in anthropometric parameters (BMI, waist circumference, mid-arm and calf circumferences on the dominant side) were observed in all groups 6 months after surgery. A significant decrease in dominant hand HGS was observed in male [47.0 (37.0–53.5) vs. 44.0 (36.5–51.5) kg, $p = 0.046$] but not in female patients. For 5xSTS, significant improvement was observed in females [10.9 (9.4–12.4) vs. 10.0 (8.8–11.0) s, $p < 0.001$] and younger participants [10.2 (9.2–11.8) vs. 9.6 (8.5–10.9) s, $p = 0.007$]. GS improved after the surgery in all participants [females 1.2 (1.0–1.3) vs. 1.4 (1.3–1.5); males 1.1 (1.0–1.2) vs. 1.3 (1.2–1.5); younger participants 1.2 (1.0–1.3) vs. 1.4 (1.3–1.5); older participants 1.0 (0.9–1.2) vs. 1.2 (1.2–1.4) m/s; all $p < 0.001$]. Except for the walking domain of the SARC-F in younger participants, subjective performance as assessed by the SARC-F questionnaire improved in all groups.
Conclusion: Subjective improvement in functional status was reported by patients six months after bariatric surgery. All participants improved their usual walking speed. Patterns of changes in muscle strength varied, men decreased their dominant hand HGS, women and younger participants improved 5xSTS results.

P862
DOES THE PENNATION ANGLE OF THE RECTUS FEMORIS MUSCLE CHANGE AFTER BARIATRIC SURGERY?

M. Małek[1], K. Piotrowicz[1], J. Gąsowski[1], M. Fedyk-Łukasik[1], A. Rudzińska[1], S. Perkisas[2], P. Major[3], B. Gryglewska[1]

[1]Dept. of Internal Medicine and Gerontology, Jagiellonian Univ. Medical College, Kraków, Poland, [2]Univ. Center for Geriatrics, Univ. of Antwerp, Antwerp, Belgium, [3]2nd Dept. of General Surgery, Jagiellonian Univ. Medical College, Kraków, Poland

Objective: To evaluate the changes in the pennation angle (PA) of the rectus femoris muscle and its homogeneity, measured by ultrasound, 6 months after bariatric surgery.
Methods: The pennation angle of the rectus femoris muscle, defined as angle between muscle fiber and deep fascia, was measured by ultrasound before and after surgery in 59 bariatric surgery patients. Measurements were done according to the SARCUS protocol for standardising the use of ultrasound in muscle assessment. Ultrasound was performed using a Phillips Affinity 70G ultrasound machine and an L12-3 linear probe with a frequency of 3–12 MHz. Standard procedure involved three measurements in each participant and, to further assess PA heterogeneity, patients whose scores varied by > 1.5 degrees were given 3 additional measurements. The mean values were analysed. Additionally, dispersion of the pennation angle (dPA) was calculated by subtracting the minimum pennation angle result from the maximum. Changes in PA and dPA in groups divided by sex and age (< 50 y and 50 + y) were calculated using the Wilcoxon signed rank test (SPSS 9.0).
Results: We included 59 patients of the mean (SD) age of 40.1 (11.3) y, 74.6% women; the median (Q1-Q3) BMI was 41.5 (39.5–44.6) and 43.9 (39.7–49.2) kg/m^2 for women and men, respectively. Significant increase of PA was observed after the surgery in all analysed groups: for women the median value (Q1-Q3) was 9.9 (8.6–10.8)° vs. 11.3 (9.3–11.9)°, $p = 0.007$; for men 9.6 (8.6–10.5)° vs. 11.8 (10.0–14.0)°, $p < 0.001$; for participants < 50 years old 9.6 (8.5–10.4)° vs. 11.3 (9.5–12.1)°, $p < 0.001$; for participants 50 + years 10.5 (9.8–11.6)° vs. 11.7 (11.1–13.5)°, $p = 0.033$. There were no significant differences in the dPA levels found in any of the groups.
Conclusion: Although the pennation angle of the rectus femoris measured by ultrasound increased six months after bariatric surgery, we did not observe an improvement in the homogeneity of its values.

The role of the pennation angle, its homogeneity and its clinical implications as a surrogate measure of skeletal muscle quality require further investigation.

P863
BONE MINERAL DENSITY POST-TREATMENT FOLLOW-UP IN WOMEN WITH ENDOMETRIOSIS TREATED WITH RELUGOLIX COMBINATION THERAPY: SPIRIT PROGRAMME

M. McClung[1], N. Johnson[2], S. L. Ferrari[3], J. S. Perry[4], Y. Zhong[5], R. B. Wagman.[5]
[1]Oregon Osteoporosis Center, Portland, USA, [2]Robinson Research Institute, Auckland, New Zealand, [3]Univ. of Geneva, Geneva, Switzerland, [4]Sumitomo Pharma American Inc., Brisbane, USA, [5]Sumitomo Pharma America Inc., Brisbane, USA.

Objective: To evaluate BMD changes in women with endometriosis (EM)-associated pain who met prespecified bone loss criteria with relugolix combination therapy (Rel-CT: relugolix 40 mg, estradiol 1 mg and norethisterone acetate 0.5 mg) in the SPIRIT long-term extension (LTE) and underwent post-treatment follow-up (PTFU).

Methods: In the pivotal SPIRIT 1/2 studies, premenopausal women (18–50 y) with moderate-to-severe EM-associated pain were randomised 1:1:1 to receive once-daily Rel-CT, placebo or delayed Rel-CT (relugolix monotherapy/Rel-CT, 12 weeks each) for 24 weeks. Completers could enroll in the 80-week SPIRIT LTE to receive open-label Rel-CT for up to 104 weeks. BMD change was measured by DXA. Women who met protocol-specified BMD loss criteria compared with pivotal study baseline by Week104/the end of treatment were referred for PTFU DXA. BMD recovery was assessed with DXA at month (M)6 and M12 after treatment cessation. Women not meeting the recovery threshold at M6 ($\leq$ 1.5% at the lumbar spine and $\leq$ 2.5% at the total hip) were recommended for an additional scan at M12. BMD percent change from pivotal baseline to last on-treatment, M6 and M12 post-treatment, and last PTFU were summarised by anatomical location.

Results: Of 802 women who entered SPIRIT LTE, 171 (21%) women had protocol-specific BMD loss or BMD loss $>$ 3% at the lumbar spine or total hip as compared with pivotal study baseline. Of women with BMD loss and underwent M6 or M12 PTFU at lumbar spine, there was evidence of recovery ($>$ 0% change from last on-treatment DXA) to M6 or M12 PTFU DXA in 27/27 (100%) women previously treated continuously with Rel-CT, and in 21/28 (75%) women initially treated with placebo. Similar trends were observed at the total hip.

Conclusion: In women with EM-associated pain who met prespecified BMD loss criteria in the SPIRIT LTE, there was recovery or trend towards recovery after treatment cessation in all women who received continuous Rel-CT therapy for up to 2 years and in most women who transitioned from placebo to Rel-CT. The benefit/risk profile of Rel-CT remains favourable in women with EM for longer-term treatment.

Acknowledgement: Funded by Sumitomo Pharma Switzerland GmBH.

Disclosures:

MRM: consulting and honoraria for speaking (Alexion, Amgen, UCB); consulting (Radius Health); board membership (International Osteoporosis Foundation, American Society of Osteoporosis Providers). NJ: speaker fees and travel (Abbot, Guerbet, Myovant sciences); Board membership (Asia Pacific Initiative on Reproduction, World Endometriosis Society). SLF: grants (Amgen, UCB); Consultant/speaker's bureau/advisory activities (Agnovos, AMGEN, Amolyt, Flowbone, Fresenius, Myovant, Parexel, Radius, UCB); patent licensing (Pro-axis Ltd [IR]). JSP, YZ, and RBW are employees of Sumitomo Pharma (previously Myovant Sciences Ltd). JSP, and RBW have stock ownership or royalties of Sumitomo Pharma (previously Myovant Sciences Ltd).

P864
ANTERIOR KNEE PAIN AFTER RECONSTRUCTION OF ANTERIOR CRUCIATE LIGAMENT

M. Milankov[1], V. Krstic[2], N. Vukosav[3], M. Bjelobrk[3]
[1]Poliklinika Milankov Med, [2]Poliklinika Sport Medica, [3]Dept. of Orthopaedic Surgery and Traumatology, Clinical Center Vojvodina, Medical Faculty of Novi Sad, Novi Sad, Serbia

Objective: Anterior knee pain is one of the most common complications after anterior cruciate ligament reconstruction with bone tendon bone autograft. Anterior knee pain can disturb rehabilitation protocol and also can lead to inability to perform activities of daily living and return to sports activities. The aim of this study was to determine the influence of gender, age, side of injury, cause of injury and type of sports activity on the occurrence of anterior knee pain after reconstruction of anterior cruciate ligament, also to determine the impact of time from injury to returning to activities.

Methods: Study was designed as a retrospective study of 967 patients who underwent arthroscopic reconstruction of the anterior cruciate ligament(Table 1). It took an average of 5 months (4–12) from the knee surgery to the start of running, and 8 months to the start of training. And it took an average of 10 months (6–12) before full competitive activity.

Results: After physical activity, 34% of respondents never feel pain, 31% feel rarely, 24% feel pain sometimes, 7% of respondents feel pain often, while 4% of respondents feel pain always. There is a low but positive statistically significant association (rho Spearman coefficient) between the frequency of pain and the time from knee surgery to the start of running (rho = 0.114, p = 0.000), to the start of training (rho = 0.115, p = 0.000) and the start of full competitive activity (rho = 0.155, p = 0.000) at the $p < 0.01$ level of statistical significance.

Table 1. Demographic data

		Frequency	Percentage (%)
Gender	male	771	79,7
	female	196	20,3
Age	14-18	130	13,4
	19-25	347	35,9
	26-35	325	33,6
	36-45	142	14,7
	45-59	23	2,4
Side of injury	Right knee	524	54,2
	Left knee	413	42,7
	Both knee	30	3,1
Mode of injury	Sports activity	924	95,6
	A walk	27	2,8
	Traffic accident	16	1,7
Type of activity	Professional athlete	372	38,5
	Recreational	547	56,6
	A non-athlete	48	5
Level of sports activity	International	109	11,3
	Republican	189	19,5
	Regional	199	20,6
	Recreational	424	43,8
	A non-athlete	46	4,8

Conclusion: Anterior knee pain is not affected by sex, age, side of injury, cause of injury, type of sports activity. There is a statistically significant correlation between anterior knee pain and time from reconstruction to returning to sports activities. Anterior knee pain

occurs already in the early stages of recovery, disturbs the rehabilitation protocol and leads to a slower return to sports activities.

P865
BENIGN NEUTROPENIA IN ORTHOPEDICS: A DEVELOPING WORLD PERSPECTIVE

M. Milenkovic[1], J. Milenkovic[2]

[1]Czech Rehabilitation Hospital, [2]Cleveland Clinic, Abu Dhabi, United Arab Emirates

Infection complications in orthopedic surgery can impose significant costs and reduce quality of life. Neutropenia is a known risk factor for infection and delayed wound healing. Recent studies have revealed a high prevalence (10–20%) of neutropenia in several populations, most notably of the Middle East and African countries. This is due to a condition called benign ethnic neutropenia (BEN) which is genetically determined (also known as familial benign neutropenia) and does not increase the risk of infection or impact overall survival. This creates novel and confusing clinical situations that could negatively affect the cost and quality of patient care like delay of surgical interventions, unnecessary investigations and use of antibiotics. Hence, there is a need for timely recognition of BEN and its differentiation from neutropenia that increase risk of infections. In this paper, we review characteristics of the BEN, use of complete blood count and management steps in the diagnosis of BEN. By increasing physician awareness, addressing diagnostic challenges, and implementing administrative policies, the impact of benign neutropenia on cost and quality of care can be mitigated.

P866
SPECIFIC CLINICAL EVALUATION OF PATIENTS WITH TYPE 2 DIABETES MELLITUS UNDERWENT REHABILITATION TREATMENT FOR DIFFERENT LOCOMOTORY DISFUNCTIONS

M. Minea[1], F. Istfan[2], L. Vlădăreanu[1], D. Oprea[3], L.-E. Stanciu[3], E.-V. Ionescu[3], C. Oprea[3], M.-G. Iliescu[4]

[1]Ovidius Univ. Faculty of Medicine Doctoral School. Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol, [2]Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol, [3]Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol, Dept. of Medical Rehabilitation, Faculty of Medicine, Ovidius Univ. of Constanta., [4]Ovidius Univ. Faculty of Medicine Doctoral School. Hospital Rehabilitation Unit, Balneal Sanatorium of Techirghiol, Dept. of Medical Rehabilitation, Faculty of Medicine, Ovidius Univ. of Constanta, Constanta, Romania

Objective: We evaluated the patients with type 2 diabetes mellitus (DM) admitted in the Balneal and Rehabilitation Sanatorium Techirghiol Romania (BRST), for different main pathologies, observing clinical and paraclinical features, cardiovascular risk factors and their response to the functional therapy.
Methods: Our descriptive retrospective study, included 483 patients with DM (from a total of 5881), admitted in the hospital unit rehabilitation department in 2023, for specific treatments. Anamnestic, clinical and paraclinical data, the BMI, functional independence measure (FIM) and pain level by visual analogue scale (VAS) were collected from the medical records. Student t-test was used for one sample and two independent samples and determined the Pearson correlation coefficient (- r).
Results: The patients were aged between 27 and 86, 226 women and 257 men. 420 were admitted for osteoarthritis (OA), followed by neurological diseases (18), post herniated disc surgery (23), secondary to an orthopedic condition (13) and inflammatory rheumatological illnesses (9). 62 had inherited history of DM. 45 subjects required only diet for the glycemic control, 402 oral antidiabetic medication (OAD), 62 insulin and 23 semaglutide. 55 patients were smokers, 63 alcohol consumers, 396 had hypertension, 32 ischaemic heart disease and heart failure 16. Major cardiovascular events (stroke, acute myocardial infarction) was noted for 17, DM neuropathy in 23 cases and 234 presented obesity. The average VAS was 6.83 at admission and 3.98 at discharge. We noticed moderate inverse correlation between delta VAS and glycosylated haemoglobin value (r =—0.4). The group without cardiovascular risk factors had a better improvement of the pain relief, compared with the one who associated 4 risk factors. Kineto-therapy was applied for 247 patients and the pain relief (VAS values) was statistically significant (p = 0,01) higher in that group compared with the one who didn't perform exercises.
Conclusion: For the majority DM was controlled by OAD and diet, up to half of them presenting different levels of obesity. The pain relief after treatment is better for the patients with an efficient controlled disease, for the ones with less cardiovascular risk factors and in the group that followed kineto-therapy.

P867
OSTEOPOROSIS AND RELATED FACTORS IN KENYA: A RETROSPECTIVE COHORT STUDY

M. Mohammed[1], T. Hassan[1], S. Ndirangu[2]

[1]Rayhaan Healthcare, Nairobi, [2]Moi Teaching and Referral Hospital, Eldoret, Kenya

Objective: The WHO defines osteoporosis as bone mass density 2.5 standard deviation or more below the average value for young and healthy population. Osteoporosis is estimated to affect 200 million individuals globally with associated 5 million disability adjusted life years[1]. There are an estimated > 8.9 million osteoporotic fractures occurring globally annually[2]. There are limited number of studies and data in Africa on the prevalence of osteoporosis. A review of 3 studies in Africa showed 39.5% (22.3–59.7%) as the highest prevalence of osteoporosis[3]. In Kenya a study in Kiambu among 254 postmenopausal women aged 50–95 y showed a prevalence of 26.4% of osteoporosis[4]. Also a review of patients attending the Nairobi Rheumatology clinic between January 2002 and January 2013 found 56 patients with osteoporosis among a retrospective evaluation of 9975 patients. Among the osteoporosis risk factors, postmenopausal women are at a greater risk of osteoporosis than men of the same age. Most of the routine DXA scan osteoporosis screening tests are targeted to postmenopausal women[5]. We aimed to investigate factors associated with occurrence of osteoporosis in patients who underwent a DXA Scan in Nairobi County.
Methods: The retrospective cohort study was carried out using a cross-sectional study design. Purposive sampling was used to recruit all subjects whose had undergone a DXA scan at Rayhaan Health care for various bone related symptoms with documented T-scores of the lumbar spine or femoral neck. Data was collected from the DXA scan machine as collected during the time of examination. Data was analyzed using MS Excel and SPSS.
Results: There were 224 subjects in the study who had undergone a DXA scan for bone related symptoms over a 2-y, 7-month period in Rayhaan Healthcare, Nairobi, Kenya. Majority were females (76.8%, n = 172), those aged 61–75 (39.3%) and Asian ethnic background (n = 121; 54%). Age of subjects ranged from 26–96 y. Subjects with BMI 25–29.9 were the majority (36.2%). The risk factors for osteoporosis evaluated in this study included alcohol intake more than three units per day, current smoking, history of previous fracture, and parental hip fracture. Other evaluated risk factors include use of glucocorticoids, rheumatoid arthritis, and secondary osteoporosis.

Among these risk factors, history of previous fracture was in majority of subjects (n = 67: 29.9%). Based on the T-score findings, the incidence of osteoporosis was 30.8% (n = 69) with majority of subjects having osteopenia (43.8%; n = 98). Among subjects with osteoporosis, highest incidence of osteoporosis in females was among those aged 61–75 (45.6%, n = 26) and among males aged over 75 y (41.7%; n = 5). Bivariate analysis revealed that age > 65 (RRR 2.287, $p < 0.001$), current smoking (RRR 35.942, $p < 0.001$), alcohol intake (RRR 6.739, $p < 0.001$), history of previous fracture (RRR 2.314, $p < 0.001$), parental hip fracture (RRR 4.493, p = 0.003), use of glucocorticoids (RRR 2.995, p = 0.037), and normal BMI (RRR 1.579, p = 0.038) conferred increased risk for osteoporosis as compared to other groups.

Conclusion: Osteoporosis presents a huge public health burden considering the aging global population and is associated with significant morbidity and mortality requiring key emphasis on targeted screening, and diagnosis of osteoporosis in Kenya. There is need for further studies to investigate factors associated with osteoporosis and to develop guidelines for screening, diagnosis, and management of osteoporosis.

References:

1. Godos J, et al. Int J Environ Res and Public Health 2022;19:1515
2. Pouresmaeili F, et al. Ther Clin Risk Manag 2018;14:2029
3. Salari N, et al. J Orthop Surg Res 2021;16:609
4. Sitati F, et al. Arch Osteoporos 2020;15:31
5. Oyoo G, et al. East Afr Orthop J 2015;9:62

P868
DRUG-VIRUS INTERACTION: COLCHICINE AND COVID-19

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the interaction between COVID-19 and colchicine.

Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on the PubMed date of 9/30/2023. Information about colchicine comes from product information on the FDA and the last updated COVID-19 from the WHO webpage.

Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. WHO does not recommend the use of colchicine with COVID-19. Based on data from 598 participants in 5 randomized controlled studies. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. The chance of a COVID-19 patient having drug-virus interactions compared to a non-COVID-19 patient is much higher. CYP3A4 is the most important metabolizing enzyme for possible drug-virus interactions. CYP3A4 suppression is extremely sensitive to IL-6 elevation and gets downregulated even with a minor increase in IL-6 as quickly as within 24 h. Because IL-6 and other cytokines have potent inhibitory effects on this isoform, clinicians should pay particular attention to the substrates of CYP3A4. For COVID-19 experimental medications (such as colchicine) and drugs for comorbidities, measurement of plasma drug levels at specific intervals is required to determine the therapeutic window in infected persons. This will make therapeutic medication monitoring easier and can reduce negative drug effects as well as liver damage caused by high drug concentrations in COVID- 19 patients. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.

Conclusion: Colchicine may increase the risk of adverse effects leading to drug discontinuation (Class III).

P869
DRUG-VIRUS INTERACTION: BARICITINIB AND COVID-19

M. Ozaybi[1]

[1]King Fahd Central Hospital, Jazan, Saudi Arabia

Objective: To focus on the interaction between COVID-19 and baricitinib.

Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on the PubMed date of 9/30/2023. Information about baricitinib comes from product information on the FDA and the last updated COVID-19 from the WHO webpage.

Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. Baricitinib is a Janus kinase (JAK) pathway inhibitor. JAK consists of a group of intracellular tyrosine kinases that transmit signals from cytokine or growth factor-receptor interactions on the cellular membrane to influence cellular processes of hematopoiesis and immune cell function. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. CYP3A4 is the most important metabolizing enzyme for possible drug-virus interactions. CYP3A4 suppression is extremely sensitive to IL-6 elevation and gets downregulated even with a minor increase in IL-6 as quickly as within 24 h. Because IL-6 and other cytokines have potent inhibitory effects on this isoform, clinicians should pay particular attention to the substrates of CYP3A4. Based on data from 2309 participants in 4 randomized controlled studies, for COVID-19 experimental medications (such as baricitinib) and drugs for comorbidities, measurement of plasma drug levels at specific intervals is required to determine the therapeutic window in infected persons. This will make therapeutic medication monitoring easier and can reduce negative drug effects as well as liver damage caused by high drug concentrations in COVID-19 patients. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.

Conclusion: With baricitinib, there is probably little to no difference in adverse effects leading to discontinuation (Class II).

P870
UNAPPROVED/UNLICENSED USE OF MEDICATION: STRATEGIES FOR ENHANCING THE QUALITY OF PATIENT SAFETY AND REDUCING HEALTH CARE COSTS

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To explore methods and strategies to improve patient safety and reduce health care costs.

Methods: We performed a review of articles that described (Raising the quality of patient safety and reducing health care costs), (off-label drugs), and (drug-drug interaction) on PubMed on Tue, Aug. 22, 2023, 14:06:35, and Wed, Aug. 30, 2023, 22:32:17.
Results: Patient safety refers to the measures and practices taken to prevent harm or injury to patients during their healthcare experience. It involves creating a safe environment, minimizing medical errors, and ensuring quality care delivery. Patient safety initiatives may include protocols, guidelines, technology, and education aimed at reducing risks, improving communication, and enhancing the overall safety of healthcare processes. It is a critical aspect of healthcare that prioritizes the well-being and protection of patients. Quick story about hydroxychloroquine with a COVID-19 lesson on drug safety and regulations: Hydroxychloroquine is a drug that was originally used to treat malaria and autoimmune disorders such as lupus and rheumatoid arthritis. It gained widespread attention during the COVID-19 pandemic, when some studies suggested it may have the potential to treat or prevent the virus. However, subsequent studies showed conflicting results, and the drug was not shown to be effective for COVID-19 treatment.
Conclusion: The following strategies will help our healthcare system raise the quality of patient safety and reduce health care costs:
1. Reducing health care costs by using AI.
2. Rationalizing and regulating responsible consumption of drugs and preventing irresponsible use.
3. Ensure that patients have full rights.
4. Monitoring adverse effects.
5. Educate health care providers.
6. Reporting adverse events.
7. Evidence-based practice: the best available evidence of the safety and efficacy of off-label drugs must be provided for intended use.
8. Documentation of the use of off-label drugs.
9. Encourages collaboration between health care providers, including pharmacists, doctors, and other members of the health care team, to ensure the appropriate use of off-label drugs.
10. Provide ongoing education and training to health care providers on the appropriate use of off-label drugs to ensure that they are up to date with the latest evidence and best practices.

P871
DRUG-VIRUS INTERACTION: TOCILIZUMAB AND COVID-19

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the interaction between COVID-19 and tocilizumab.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on the PUBMED date of 9/30/2023. Information about tocilizumab comes from product information on the FDA and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. Tocilizumab is an IL-6 receptor antagonist. IL-6 is a pleiotropic proinflammatory cytokine produced by a variety of cell types, including T- and B-cells, lymphocytes, monocytes, and fibroblasts. IL-6 has been shown to be involved in diverse physiological processes such as T-cell activation, induction of immunoglobulin secretion, initiation of hepatic acute phase protein synthesis, and stimulation of hematopoietic precursor cell proliferation and differentiation. IL-6 is also produced by synovial and endothelial cells, leading to local production of IL-6 in joints affected by inflammatory processes. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. CYP3A4 is the most important metabolizing enzyme for possible drug-virus interactions. CYP3A4 suppression is extremely sensitive to IL-6 elevation and gets downregulated even with a minor increase in IL-6 as quickly as within 24 h. Because IL-6 and other cytokines have potent inhibitory effects on this isoform, clinicians should pay particular attention to the substrates of CYP3A4. Based on data from 815 participants in 2 randomized controlled studies for COVID-19, experimental medications such as tocilizumab. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.
Conclusion: The effect of tocilizumab on adverse events leading to discontinuation is uncertain (Class II).

P872
DRUG-VIRUS INTERACTION: IVERMECTIN AND COVID-19

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the interaction between COVID-19 and ivermectin.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on the PubMed date of 9/30/2023. Information about ivermectin comes from product information on the FDA and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. Ivermectin is a medication used to treat parasitic infections. The antiviral activity of Ivermectin has been shown against a wide range of RNA and DNA viruses, for example, dengue, Zika, yellow fever, and others. The FDA has not approved ivermectin for use in treating or preventing COVID-19 infection in humans. The WHO recommends not using ivermectin in patients with COVID-19 to reduce viral replication, except in clinical trials. Based on data from 584 participants in 3 randomized controlled studies. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. CYP3A4 is the most important metabolizing enzyme for possible drug-virus interactions. CYP3A4 suppression is extremely sensitive to IL-6 elevation and gets downregulated even with a minor increase in IL-6 as quickly as within 24 h. Because IL-6 and other cytokines have potent inhibitory effects on this isoform, clinicians should pay particular attention to the substrates of CYP3A4. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.
Conclusion: Ivermectin may increase the risk of serious adverse events leading to drug discontinuation (Class III).

P873
DRUG-VIRUS INTERACTION: LOPINAVIR + RITONAVIR AND COVID-19

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the interaction between lopinavir, ritonavir, and COVID-19.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on the PubMed date of 9/30/2023. Information about lopinavir + ritonavir comes from product information on the FDA and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. Lopinavir and ritonavir are a combination of antiviral medications used to treat HIV. Common side effects of lopinavir and ritonavir may include nausea, vomiting, diarrhea, or high cholesterol or triglycerides. WHO does not recommend the use of lopinavir and ritonavir with COVID-19. Based on data from 259 participants in 2 randomized controlled studies, the outcome was acute kidney injury. Based on data from 370 participants in 4 randomized controlled studies, the outcome was diarrhea. Based on data from 370 participants in 4 randomized controlled studies, the outcome was nausea or vomiting. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an CYP3A4 suppression that is extremely sensitive to IL-6 elevation and gets downregulated even with a minor increase in IL-6 as quickly as 24 h. Because IL-6 and other cytokines have potent inhibitory effects on this isoform, clinicians should pay particular attention to the substrates of CYP3A4. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.
Conclusion: Lopinavir + ritonavir and COVID-19 were examples of this interaction in Class III.

P874
MALIK'S DRUG-VIRUS INTERACTION: A NEW STRATEGY FOR ENHANCING QUALITY OF PATIENT SAFETY AND REDUCING HEALTH CARE COSTS

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the interaction between drugs and viruses.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on the PubMed sent on Friday, September 29, 22:12:34, 2023. A two-step approach was performed to detect clinically relevant drug interactions between drugs and viruses. First, understanding COVID-19 from basic mechanisms to clinical perspectives. Second, information about drugs comes from FDA and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Based on data from 2309 participants for baricitinib, based on data from 15,243 participants for convalescent plasma, based on data from 15,406 participants for casirivimab and imdevimab, based on data from 598 participants for colchicine, and based on data from 6118 participants for hydroxychloroquine, the outcome was cardiac toxicity, diarrhea, nausea or vomiting, and delirium. Based on data from 815 participants for IL-6 receptor blockers (tocilizumab or sarilumab), based on data from 584 participants for ivermectin, based on data from 629 participants for lopinavir and ritonavir, based on data from 4796 participants for molnupiravir, based on data from 2246 participants for nirmatrelvir and ritonavir, based on data from 956 participants for ruxolitinib, based on data from 1379 participants for remdesivir, based on data from 14,013 participants for systemic corticosteroids, based on data from 1044 participants for sotrovimab, based on data from 284 participants for tofacitinib. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. These reactions may range from no predicted interaction to clinically relevant interactions that require the avoidance of concomitant administration. CYP3A4 is the most important metabolizing enzyme for possible drug-virus interactions. Because IL-6 and other cytokines have potent inhibitory effects on this isoform, clinicians should pay particular attention to the substrates of CYP3A4.
Conclusion: Drug-virus interaction can be classified into three categories based on severity and relevance: class I, no predicted interaction; class II, predicted interaction but unknown relevance; and class III, clinically relevant interaction, which should be avoided.

P875
MALIK'S DRUG-VIRUS INTERACTION: HYDROXYCHLOROQUINE AND COVID-19

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the interaction between hydroxychloroquine and COVID-19.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on the PubMed sent on Friday, September 29, 22:12:34, 2023. From 18, we took three that met our objective. A two-step approach was performed to detect clinically relevant drug interactions between hydroxychloroquine and COVID-19. First, understanding COVID-19 from basic mechanisms to clinical perspectives. Second, information about hydroxychloroquine comes from FDA-approved labeling information and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. WHO does not recommend the use of hydroxychloroquine with COVID-19. Based on data from 3287 participants in 7 randomized controlled studies, the outcome was cardiac toxicity. Based on data from 979 participants in 6 randomized controlled studies, the outcome was diarrhea. Based on data from 1429 participants in 7 randomized controlled studies, the outcome was nausea or vomiting. Based on data from 423 participants in one randomized controlled study, the outcome was delirium. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. These reactions may range from no predicted interaction to clinically relevant interactions that require the avoidance of concomitant administration. CYP3A4 is the most important metabolizing enzyme for possible drug-virus interactions. Because IL-6 and other cytokines have potent inhibitory effects on this isoform, clinicians should pay particular attention to the substrates of CYP3A4. Two major mechanisms of interaction between hydroxychloroquine and

COVID-19 are pharmacokinetics and pharmacodynamics. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.
Conclusion: Hydroxychloroquine and COVID-19 were examples of this interaction in Class III.

P876
MALIK'S DRUG-VIRUS INTERACTION: MECHANISMS OF INTERACTIONS

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the mechanisms of interaction between drugs and viruses.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on the PubMed sent on Friday, September 29, 22:12:34, 2023. A two-step approach was performed to detect clinically relevant drug interactions between drugs and COVID-19. First, understanding COVID-19 from basic mechanisms to clinical perspectives. Second, information about drugs comes from FDA-approved labeling information and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. CYP3A4 is the most important metabolizing enzyme for possible drug-virus interactions. WHO does not recommend the use of hydroxychloroquine with COVID-19. Two major mechanisms of interaction between hydroxychloroquine and COVID-19 are pharmacokinetics and pharmacodynamics. Pharmacokinetic interactions occur when viruses affect the way a drug is absorbed, distributed, metabolized, or eliminated in the body. Pharmacodynamic interactions occur when the virus and the drug have similar or opposing effects, leading to additive, synergistic, or antagonistic effects. Combined toxicity happens when a virus causes a toxic effect on the body or a drug, causing a toxic effect that would not occur on its own. Displacement interactions occur when the virus displaces the drug from its binding site, resulting in increased levels of the drug in the body. Enzyme induction or inhibition occurs when the virus affects the activity of the enzymes responsible for drug metabolism, leading to changes in its effectiveness or the potential for side effects.
Conclusion: Hydroxychloroquine and COVID-19 were examples of these mechanisms of interaction.

P877
MALIK'S DRUG-VIRUS INTERACTION: COVID-19 AS MAJOR CYTOCHROME P450 ENZYMES INHIBITOR

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on exploring how COVID-19 may act as an inhibitor of the major CYP450.
Methods: We performed a review of articles describing (off-label drug) and (drug disease interaction) on Wednesday, August 30, 2023, at 22:32:17, and articles describing (COVID-19 and drug-disease interactions) on Friday, September 29, 2023, at 22:12:34, both on PubMed. A two-step approach was performed to detect clinically relevant drug interactions between drugs and viruses. First, understanding COVID-19 from basic mechanisms to clinical perspectives. Second, the last updated COVID-19 is from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. WHO does not recommend the use of hydroxychloroquine with COVID-19. Based on data from 3287 participants in 7 randomized controlled studies, the outcome was cardiac toxicity. Based on data from 979 participants in 6 randomized controlled studies, the outcome was diarrhea. Based on data from 1429 participants in 7 randomized controlled studies, the outcome was nausea or vomiting. Based on data from 423 participants in one randomized controlled study, the outcome was delirium. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. These reactions may range from no predicted interaction to clinically relevant interactions that require the avoidance of concomitant administration. The chance of a COVID-19 patient having a virus-drug interaction compared to a non-COVID-19 patient is much higher. COVID-19 patients will experience acute suppressive effects on CYP expression, reduced drug metabolism, decreased drug elimination, and eventually local and systemic drug toxicity as early as 48–72 h after active infection. CYP3A4, CYP2B6, and CYP2C9 are the most important metabolizing enzymes for drug-virus interactions. Because IL-6 and other cytokines have potent inhibitory effects on this isoform, clinicians should pay particular attention to these enzymes.
Conclusion: Hydroxychloroquine and COVID-19 were examples of this interaction.

P878
MALIK'S DRUG-VIRUS INTERACTION: COLCHICINE AND COVID-19

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the interaction between COVID-19 and colchicine.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on PubMed Friday, September 29, 2023, at 22:12:34. Information about colchicine comes from FDA-approved labeling information and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. WHO does not recommend the use of colchicine with COVID-19. Based on data from 598 participants in 5 randomized controlled studies. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. The chance of a COVID-19 patient having drug-virus interactions compared to a non-COVID-19 patient is much higher. CYP3A4 is the most important metabolizing enzyme for possible drug-virus interactions. CYP3A4 suppression is extremely sensitive to IL-6 elevation and gets downregulated even with a minor increase in IL-6 as quickly as within 24 h. Because IL-6 and other cytokines have potent

inhibitory effects on this isoform, clinicians should pay particular attention to the substrates of CYP3A4. For COVID-19 experimental medications (such as colchicine) and drugs for comorbidities, measurement of plasma drug levels at specific intervals is required to determine the therapeutic window in infected persons. This will make therapeutic medication monitoring easier and can reduce negative drug effects as well as liver damage caused by high drug concentrations in COVID-19 patients. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.
Conclusion: Colchicine may increase the risk of adverse effects leading to drug discontinuation (Class III).

P879
MALIK'S DRUG-VIRUS INTERACTION: BARICITINIB AND COVID-19

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the interaction between COVID-19 and baricitinib.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on PubMed Friday, September 29, 2023, at 22:12:34. Information about baricitinib comes from FDA-approved labeling information and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. Baricitinib is a Janus kinase (JAK) pathway inhibitor. JAK comprises a group of intracellular tyrosine kinases that transmit signals from cytokines or development factor receptors intelligent on the cellular layer to impact cellular forms of hematopoiesis and immune cell function. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. CYP3A4 is the most important metabolizing enzyme for possible drug-virus interactions. CYP3A4 suppression is extremely sensitive to IL-6 elevation and gets downregulated even with a minor increase in IL-6 as quickly as within 24 h. Because IL-6 and other cytokines have potent inhibitory effects on this isoform, clinicians should pay particular attention to the substrates of CYP3A4. Based on data from 2309 participants in 4 randomized controlled studies, for COVID-19 experimental medications (such as baricitinib) and drugs for comorbidities, measurement of plasma drug levels at specific intervals is required to determine the therapeutic window in infected persons. This will make therapeutic medication monitoring easier and can reduce negative drug effects as well as liver damage caused by high drug concentrations in COVID-19 patients. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.
Conclusion: With baricitinib, there is probably little to no difference in adverse effects leading to discontinuation (Class II).

P880
MALIK'S DRUG-VIRUS INTERACTION: TOCILIZUMAB AND COVID-19

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the interaction between COVID-19 and tocilizumab.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on PubMed Friday, September 29, 2023, at 22:12:34. Information about tocilizumab comes from FDA-approved labeling information and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Tocilizumab is an IL-6 receptor antagonist. Tocilizumab, being a monoclonal antibody, is metabolized differently from small-molecule drugs. It does not undergo the same type of metabolism as chemicals or biologically active small molecules that are often processed by liver enzymes. Instead, tocilizumab is broken down into smaller peptides and amino acids through catabolic pathways that are widely distributed throughout the body. These processes occur at the cellular level, mainly through the action of proteolytic enzymes. Since it is a protein, tocilizumab isn't subject to liver enzyme cytochrome P450-mediated metabolism, and it doesn't have the same types of drug-drug interactions that small-molecule drugs might have. However, the pharmacokinetics of tocilizumab or any biological drug can be complex, and individual factors such as immune function can affect how the drug is metabolized and cleared from the body. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. CYP3A4 suppression is extremely sensitive to IL-6 elevation and gets downregulated even with a minor increase in IL-6 as quickly as within 24 h. Based on data from 815 participants in 2 randomized controlled studies for COVID-19, the experimental medication was tocilizumab. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.
Conclusion: The effect of tocilizumab on adverse events leading to discontinuation is uncertain (Class II).

P881
MALIK'S DRUG-VIRUS INTERACTION: IVERMECTIN AND COVID-19

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the interaction between COVID-19 and ivermectin.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on PubMed Friday, September 29, 2023, at 22:12:34. Information about ivermectin comes from FDA-approved labeling information and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. Ivermectin is an anti-parasitic medication widely used to treat

infections caused by various parasites, including those that lead to conditions such as onchocerciasis (river blindness), strongyloidiasis, and scabies. It works by binding to the invertebrate muscle and nerve cells of parasites, causing paralysis and the death of the parasites. The WHO recommends not using ivermectin in patients with COVID-19 to reduce viral replication, except in clinical trials. Based on data from 584 participants in 3 randomized controlled studies. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. CYP3A4 is the most important metabolizing enzyme for possible drug-virus interactions. CYP3A4 suppression is extremely sensitive to IL-6 elevation and gets downregulated even with a minor increase in IL-6 as quickly as within 24 h. Because IL-6 and other cytokines have potent inhibitory effects on this isoform, clinicians should pay particular attention to the substrates of CYP3A4. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.
Conclusion: Ivermectin may increase the risk of serious adverse events leading to drug discontinuation (Class III).

P882
MALIK'S DRUG-VIRUS INTERACTION: LOPINAVIR, RITONAVIR, AND COVID-19

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia.

Objective: To focus on the interaction between lopinavir, ritonavir, and COVID-19.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on PubMed Friday, September 29, 2023, at 22:12:34. Information about lopinavir and ritonavir comes from FDA-approved labeling information and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. Lopinavir and ritonavir are a combination of antiviral medications used to treat HIV. Common side effects of lopinavir and ritonavir may include nausea, vomiting, diarrhea, or high cholesterol or triglycerides. WHO does not recommend the use of lopinavir and ritonavir with COVID-19. Based on data from 259 participants in 2 randomized controlled studies, the outcome was acute kidney injury. Based on data from 370 participants in 4 randomized controlled studies, the outcome was diarrhea. Based on data from 370 participants in 4 randomized controlled studies, the outcome was nausea or vomiting. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an CYP3A4 suppression that is extremely sensitive to IL-6 elevation and gets downregulated even with a minor increase in IL-6 as quickly as 24 h. Because IL-6 and other cytokines have potent inhibitory effects on this isoform, clinicians should pay particular attention to the substrates of CYP3A4. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.
Conclusion: Lopinavir, ritonavir, and COVID-19 were examples of this interaction in Class III.

P883
MALIK'S DRUG-VIRUS INTERACTION: NIRMATRELVIR, RITONAVIR, AND COVID-19

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the interaction between nirmatrelvir, ritonavir, and COVID-19.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on PubMed Friday, September 29, 2023, at 22:12:34. Information about nirmatrelvir and ritonavir comes from FDA-approved labeling information and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. Nirmatrelvir and ritonavir are a combination of antiviral medications used to treat SARS-CoV-2. Nirmatrelvir is a peptidomimetic inhibitor. It is boosted with low dose ritonavir to decrease metabolism of nirmatrelvir by inhibiting CYP3A4. Based on data from 2246 participants in one randomized controlled study, nirmatrelvir-ritonavir has little or no risk of adverse effects leading to drug discontinuation. Drug-virus interactions occur when a virus changes the body's response to a drug, causing CYP3A4 suppression that is extremely sensitive to IL-6 elevation and gets downregulated even with a minor increase in IL-6 as quickly as 24 h. Because IL-6 and other cytokines have potent inhibitory effects on this isoform, clinicians should pay particular attention to the substrates of CYP3A4. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.
Conclusion: Nirmatrelvir, ritonavir, and COVID-19 were examples of this interaction in Class II.

P884
MALIK'S DRUG-VIRUS INTERACTION: MOLNUPIRAVIR AND COVID-19

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the interaction between molnupiravir and COVID-19.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on PubMed Friday, September 29, 2023, at 22:12:34. Information about molnupiravir comes from FDA-approved labeling information and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. Molnupiravir is a prodrug of nucleoside analogue beta-D-N4-hydroxycytidine (NHC). Molnupiravir is metabolized primarily in the liver to the active form β-D-N4-hydroxycytidine-5'-triphosphate (NHC-TP), through a series of phosphorylation steps. Possible side effects of molnupiravir include diarrhea, nausea, dizziness, hypersensitivity, anaphylaxis, angioedema, erythema, rash, and urticaria.

Based on data from 4796 participants in 6 randomized controlled studies, molnupiravir has little or no risk of adverse effects leading to drug discontinuation. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. The chance of a COVID-19 patient having a virus-drug interaction compared to a non-COVID-19 patient is much higher. Symptoms of COVID-19 start after the 4th day of infection, and immune response-based inflammation is a hallmark of the disease. Patients can experience a cytokine storm in severe cases, where there is an overproduction of immune cells and their signaling molecules. This can lead to changes in multiple metabolic pathways and contribute to organ dysfunction. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.
Conclusion: Molnupiravir and COVID-19 were examples of this interaction in Class II.

P885
MALIK'S DRUG-VIRUS INTERACTION: SYSTEMIC CORTICOSTEROIDS AND COVID-19

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To focus on the interaction between systemic corticosteroids and COVID-19.
Methods: We performed a review of articles describing COVID-19 and drug-disease interactions. The searches were conducted on PubMed Friday, September 29, 2023, at 22:12:34. Information about systemic corticosteroids comes from FDA-approved labeling information and the last updated COVID-19 from the WHO webpage.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions are not considered. Despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. Systemic corticosteroids are a class of medications that are widely used for their potent anti-inflammatory and immunosuppressive effects. These medications are used to treat a variety of conditions, including asthma, autoimmune diseases, allergic reactions, and inflammation. Common systemic corticosteroids include prednisone, methylprednisolone, and dexamethasone. Systemic corticosteroids can have significant side effects, especially with long-term use, such as increased risk of infections, osteoporosis, adrenal suppression, weight gain, diabetes, and others. Due to these potential effects, their use is generally carefully monitored for drug-virus interaction by healthcare providers. Based on data from 8938 participants in 24 studies, the outcome was hyperglycemia. Based on data from 5015 participants in 6 studies, the outcome was hypernatremia. Drug-virus interactions occur when a virus changes the body's response to a drug, causing an unwanted reaction. COVID-19 patients will experience acute suppressive effects on CYP expression, reduced drug metabolism, decreased drug elimination, and eventually local and systemic drug toxicity as early as 48–72 h after active infection. CYP3A4, CYP2B6, and CYP2C9 are the most important metabolizing enzymes for drug-virus interactions. Because IL-6 and other cytokines have potent inhibitory effects on this isoform, clinicians should pay particular attention to these enzymes. These interactions can be classified into three categories based on severity and relevance: Class I, no predicted interaction; Class II, predicted interaction but unknown relevance; and Class III, clinically relevant interaction, which should be avoided.
Conclusion: Systemic corticosteroids and COVID-19 were examples of this interaction in Class III.

P886
PHARMACOVIROLOGY SCIENCE: A NEW SCIENCE FOR ENHANCING QUALITY OF PATIENT SAFETY AND REDUCING HEALTH CARE COSTS

M. Ozaybi[1]

[1]Pharmaceutical Care Dept., King Fahad Central Hospital, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

Objective: To the establishment or discussion of a scientific field that combines pharmacology and virology.
Methods: We performed a review of articles that described (raising the quality of patient safety and reducing health care costs), (off-label drugs), (drug-drug interaction), and (COVID-19 and drug-disease interactions) on PubMed Tue, Aug. 22, 2023, 14:06:35, Wed, Aug. 30, 2023, 22:32:17, on Friday, September 29, 2023, at 22:12:34.
Results: Pharmacists and physicians often pay so much attention to drug-drug interactions, but drug-virus interactions and virus-disease interactions are not considered. Lack of knowledge: despite significant progress in the field of virology, there is still much that scientists do not know about how viruses work, how they spread, and how they can be effectively treated. WHO does not recommend the use of hydroxychloroquine with COVID-19. Based on data from 3287 participants in 7 randomized controlled studies, the outcome was cardiac toxicity. Based on data from 979 participants in 6 randomized controlled studies, the outcome was diarrhea. Based on data from 1429 participants in 7 randomized controlled studies, the outcome was nausea or vomiting. Based on data from 423 participants in one randomized controlled study, the outcome was delirium. There is a high prevalence of pre-existing CVD among patients with COVID-19, such as myocardial injury, arrhythmias, acute coronary syndrome, and venous thromboembolism. Patients with certain conditions (e.g., hypertension, diabetes, hyperlipidemia) are more susceptible to the infection than the general population. Poorly controlled blood glucose levels can increase the risk of infections in general and may also lead to worse outcomes in COVID-19.
Conclusion: Pharmacovirology science is a field that studies the interaction of drugs and diseases with viruses. This can involve looking at how viruses work, how they spread, and how they can be effectively treated. Pharmacovirology is a specialized field within pharmacology and virology.

P887
ADVANCING OSTEOARTHRITIS RESEARCH THROUGH PATIENT-SPECIFIC ORGAN-ON-A-CHIP MODELING

M. Pasztorek[1], J. Fischer[1], A. Otahal[2], A. De Luna[2], S. Nehrer[2], J. Rosser[1]

[1]Pregenerate, Vienna, Austria, [2]Univ. for Continuing Education, Krems, Austria

Authors:
Markus Pasztorek[1], Johanna Fischer[1], Alexander Otahal[2], Andrea de Luna[2], Stefan Nehrer[2], Julie Rosser[1]
[1]Pregenerate GmbH, Vienna, Austria
[2]Center for Regenerative Medicine, Dept. for Health Sciences, Medicine and Research, University for Continuing Education Krems, Krems an der Donau, Austria

Objective: This study introduces a novel in-vitro model utilizing Organ-on-a-Chip (OoC) technology to investigate patient-specific responses of osteoarthritic chondrocytes to various medications. The objective is to gain insights into the complex interplay between cellular behavior, molecular responses, and potential therapeutic interventions for osteoarthritis (OA).

Methods: Chondrocytes were isolated from cartilage biopsies from arthroplasties of thirteen osteoarthritic patients (male and female, aged 42–80) and cultured in the microfluidic chip Optimate OA^{TM} to mimic the joint microenvironment. The cells were subjected to a 10-d experiment involving treatment with medications commonly used for OA management (hyaluronic acid, triamcinolone, diclofenac, PDGF-BB). Fluorescence microscopy, RNA extraction, and RT-PCR were employed to assess cell morphology, viability, and gene expression patterns.
Results: The 3D-cultivated chondrocytes exhibited a rounded morphology, reminiscent of their natural state, with a survival rate exceeding 80%. Gene expression analysis revealed distinct responses to medications, particularly in degenerative and regenerative markers. Triamcinolone demonstrated inhibitory effects on matrix metalloproteinases and IL-6. Patient-specific variations in treatment responses were observed.
Conclusion: This study provides a comprehensive understanding of chondrocyte responses within an OoC environment, offering insights into the potential therapeutic effects of commonly used OA medications. The results underscore the importance of individualized approaches and highlight the suitability of OoC systems for studying OA pathogenesis and treatment strategies.
Acknowledgments: Gratitude to Syed Faheem Ali, MSc., for his support throughout the study.
Disclosures:
M Pasztorek and J Fischer are employees of PreGenerate GmbH; J Rosser owns the patent of Optimate OA technology and received a consultation honorarium as CEO from PreGenerate GmbH.

P888
SARCOPENIA IS A STRONG PREDICTOR OF ALL-CAUSE MORTALITY IN THE ELDERLY

M. Ebrahimpur[1], M. Payab[2], F. Sharifi[3], P. Ebrahimi[4], A. Ayati[5], Z. Shadman[3]

[1]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [2]Non-Communicable Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, [3]Elderly Health Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, [4]Tehran Heart Center, Tehran Univ. of Medical Sciences, [5]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: The prevalence of sarcopenia is increasing in the world. This study was designed to investigate the association between all-Cause Mortality and sarcopenia.
Methods: The results of this study were come from Birjand Longitudinal Aging study (BLAS). The subjects were volunteers aged > 60 y who were participants in an aging cohort study on a community dwelling older adults that started in 2018. The death occurrence was registered by telephone interview with the family of the participants during September 2018 to end of 2023. Sarcopenia was defined according to EWGSOP2. Hand grip was measured six times (three times in each hand) the maximum values were considered as value of hand grip. Muscle mass was measured using body adiposity index (BAI) that corrected by BMI. Gait speed was measured over six meters three times and the maximum of last two measurements was used for more calculations. Univariate and multiple Logistic regression models adjusted for age, gender, number of morbidities, and BMI were used for assessing association between sarcopenia and all-Cause Mortality.
Results: Mean age of the 1354 participants was 69.77 $\pm$ 7.55 y and 703 subjects of the participants were female. In final model after adjustment for age, sex, number of morbidities and BMI, probable sarcopenia and severe sarcopenia were associated with death (odds ratio of probable sarcopenia 1.65; CI 95% 1.04–2.60, 1.43; sarcopenia CI 95% 0.56–3.62, and severe sarcopenia 3.02 CI 95% 1.43–6.39).
Conclusion: Sarcopenia is a strong predictor of the all-cause mortality in elderly. There is a serious attention to screen for frailty in general population and carry out appropriate multidisciplinary intervention strategies to prevent poor outcomes and reduce the rate of mortality among elderly.

P889
CLINICAL CASE OF A PATIENT WITH FORESTIER'S DISEASE IN A PATIENT WITH ACROMEGALY

M. Perepelova[1], E. Przhiyalkovskaya[1], L. Dzeranova[1], N. Tarbaeva[1], L. Kovalevich[1], V. Ankina[1], S. Chechelnitskaya[1], E. Gavrilova[1], E. Pigarova[1]

[1]Endocrinology Research Centre, Moscow, Russia

Long-term exposure to elevated levels of growth hormone can cause numerous pathological changes in the spine, including degenerative joint disease, axial arthropathy, spinal stenosis, vertebral fracture, and diffuse skeletal hyperostosis. Forestier's disease is a rare non-inflammatory disease of the musculoskeletal system associated with calcification of ligaments and tendons, which gradually leads to ankylosis and limitation of the patient's mobility. Forestier's disease still remains one of those pathologies whose etiology is unknown, and specific treatment has not been developed. We present a clinical case of a patient with Forestier disease and acromegaly.
Case report: Patient D., aged 62 y, with acromegaly after transnasal adenomectomy in 2018 and on therapy with somatostatin analogues, was hospitalized in 2023 in the endocrinology hospital for treatment correction. I have been experiencing joint pain since I was 37 years old; acromegaly was diagnosed at 48 years old. During hospitalization, the absence of remission of the underlying disease was confirmed—the IGF-1 level was 346 ng/ml (16–245). One of the patient's main complaints was back pain when trying to straighten up, limited mobility in large joints (shoulder, knee, hip). According to the results of a multislice computed tomography of the thoracic spine: signs of subtotal calcification of the longitudinal and interspinous ligaments (corresponding to Forestier's disease). Rheumatoid arthritis was excluded. Consulted with a rehabilitation specialist, muscle tone is diffusely reduced; deformations of skeletal bones of the acromegaloid type; range of motion in large joints is reduced; posture (computer optical topography): full straightening of the back is impossible due to spasms of the iliac muscles; feet on both sides—the initial stages of the hollow foot. Several physical therapy sessions were conducted, after which the patient felt a significant improvement, and it was recommended to continue rehabilitation activities on an outpatient basis.
Conclusion: It is important that patients with acromegaly be screened for degenerative spinal disease at diagnosis, as failure to promptly treat the disease process, including rehabilitation, can lead to irreversible damage.

P890
ADHERENCE TO MEDITERRANEAN DIET AND ITS ASSOCIATIONS WITH RHEUMATOID ARTHRITIS

M. Rachdi[1], A. Feki[1], S. Ben Jemaa[1], Z. Gassara[1], M. Ezzedine[1], M. H. Kallel[1], H. Fourati[1], R. Akrout[1], S. Baklouti[1]

[1]Dept. of Rheumatology, Hedi Chaker Hospital, Sfax, Tunisia

Objective: Healthy diet and lifestyle have been associated with a better disease control in rheumatoid arthritis (RA) patients. We aim to evaluate the impact of adherence to mediterranean diet (MD) which is worldwide sponsored as a healthy diet on disease activity and quality of life among Tunisian RA patients.
Methods: It's a cross-sectional study including patients with RA who fulfilled the 2010 ACR/ EULAR criteria. Sociodemographic data and disease characteristics were collected. Adherence to MD was assessed via the Mediterranean Diet Score (MDS): a validated index, including 9 components and ranging from 0 (no adherence) to 9 (complete adherence) points. The quality of life was assessed using the Rheumatoid Arthritis Impact of disease score (RAID): a patient-reported outcome measure to evaluate the impact RA on a patient's quality of life. It includes domains of pain, function, fatigue, sleep disturbance, emotional and physical wellbeing, and coping. RAID < 2 was defined as a patient acceptable state. P values < 0.05 were considered significant.
Results: 53 patients with RA were included: 36 women (67.9%) and 17 (32%) men with a mean age of 44.7 y [22–64]. The median disease duration was 87.1 months [9–277]. Mean BMI was 23.1 kg/m^2 [16.4–32.1]. The median DAS28ESR was 2.24 [1.32–3.76]. Main tender joint count (TJC28), Swollen joint count (SJC28), Patient global assessment (PGA) and visual analogue scale (VAS) were:3[0–7], 1[0–4], 3[0–6],4 [0–7] respectively. The mean morning stiffness duration was 33 min [0–60]. The mean HAQ value was 0.34 [0–1]. Mean RAID score was 3.12 [0.86–4.8]. The mean MDS score was 5.9 [1–9]. Patient's levels of adherence were distributed as follows: low adherence (MDS [0–3]), medium adherence (MDS [4–6]) and high adherence (MDS [7–9]) in 31.6%, 46.2% and 21.2% respectively. A significant association between MDS and morning stiffness (p = 0.04), PGA (p = 0.02) and HAQ (P = 0.05) was found. However, no statistically significant association was found between MD adherence and DAS28 ESR (p = 0.341). RAID total score had a statistically significant negative correlation with MDS p = 0.03).
Conclusion: Diet is a major modifiable determinant of chronic diseases. Although a modest impact of MD was described on objective parameters, an important effect on the more subjective aspects of the disease was highlighted in our study.

P891
CHALLENGE OF IDENTIFYING FIBROMYALGIA IN TUNISIAN GERIATRIC POPULATION

M. Boudokhane[1], M. Rachdi[1], H. Bettaieb[1], R. Bourguiba[1], W. Helali[1], M. Ayari[1], I. Abdelaali[1], H. Douggui[1], T. Jomni[1], S. Bellakhal[1]

[1]Dept. of Internal Medicine, Internal Security Forces Hospital., Marsa, Tunisia

Objective: The peak incidence of fibromyalgia (FM) is reported to be between 30–50 y. Yet, many older adults experience chronic pain which should not be accepted as a feature of aging. We aim to assess the prevalence and characteristics of FM among older patients.
Methods: We conducted a study including patients aged > 65 y. Epidemio-clinic data was gathered. FM was diagnosed according to the modified ACR diagnosis criteria for FM 2016. The results were statistically significant if the p-value was < 0.05.
Results: 34 patients: 20 women (64.5%) and 11 male (35.4%) with a mean age of 71 y [65–78] were enrolled. Six patients (19%) were smokers with a mean cumulative exposure to tobacco smoke estimated to 25 packyear [20–46]. The mean number of co-morbidities was 2.4 [0–4] distributed as follows diabetes(n = 14), high blood pressure(n = 12), cardiac disease (n = 9), osteoporosis (n = 9), osteoarthritis (n = 28), rheumatoid arthritis(n = 3) and inflammatory bowel disease(n = 3) corresponding to 41%, 35.2%, 26.4%, 26.4%, 82.3%, 8.82%,8.82 respectively. The mean BMI was 22.6 kg/m^2 [15.4–31.1]. Twenty-eight patients (82.3%) reported having experienced generalized pain for at least 3 months. Among them 22 patients (64.7%) met the ACR 2016 modified criteria for FM diagnosis. The mean number of tender points was 13 ± 2. The mean SSS was 5 ± 3. The mean visual analogue scale (VAS) was 5.13 [3–9]. Intensity of pain was reported to increase with mobilization in 12 patients (35.2%) and bad mood in 29 patients (85.2%). Factors alleviating the pain were: Rest(n = 9, 26.4%), distraction(n = 11, 32%), sleep(n = 14, 41.1%), alternative therapies (n = 10, 29.4%). The overall prevalence of FM was significantly related to female gender (p = 0.05) and the high number of comorbidities (p = 0.03). The increased number of tender points was significantly observed in women (p = 0.03). BMI > 25 was statistically significant to the presence of tenderness (p = 0.04), and waking-up unrefreshed (p = 0.012).
Conclusion: Identifying FM via a careful anamnesis and physical examination, in the vulnerable population of older patients is crucial in order to offer them the appropriate management.

P892
SHEDDING LIGHT ON SEXUAL DYSFUNCTION IN PATIENTS WITH CHRONIC LOW BACK PAIN

M. Boudokhane[1], M. Rachdi[1], H. Bettaieb[1], R. Bourguiba[1], W. Helali[1], M. Ayari[1], I. Abdelaali[1], H. Douggui[1], T. Jomni[1], S. Bellakhal[1]

[1]Dept. of Internal Medicine, Internal Security Forces Hospital., Marsa, Tunisia

Objective: To determine the prevalence of sexual dysfunction in patients suffering from CLBP.
Methods: It's a cross-sectional study including patients diagnosed with CLBP. Sociodemographic data and disease characteristics were collected. Patients having diseases or taking treatments interfering with sexual function were excluded. The sexual function was assessed in male and female patients with the international index of erectile function (IIEF-5) and the female sexual function index (FSFI) respectively. The IIEF is a validated multidimensional, self-administrated, 5-question questionnaire. A score of 0–5 is awarded to each of the 5 questions. The lower the score the more severe the sexual dysfunction. The FSFI is a 19-item self-report measure of female sexual function that provides scores on overall levels of sexual function in women. The 19 items of the FSFI use a 5-point Likert scale ranging from 1–5 with higher scores indicating greater levels of sexual functioning. The results were statistically significant if the p-value was < 0.05.
Results: 52 patients (38 men and 14 women) were included. The main age was 41 y [29–58]. 10 patients had primary level (19.2%), 8 (15,3%) had secondary level and 34 (65,3%) had a bachelor's level. The mean BMI was 23.2 kg/m^2 [19.6–31.1]. 18 patients (34.6%) were obese (BMI $\geq$ 30 kg/m^2). The mean waist circumference was 96 cm [84–110] and 87 [82–98] in men and women respectively. The mean disease duration was 48 months [6–108]. The mean visual analogue scale (VAS) was 50 cm [0–80]. 23 patients (44.2%) had severe pain (VAS $\geq$ 70). The functional impact was assessed with the Oswestry low back pain disability questionnaire and the mean score was 34 [0–57]. The main IIEF5 score in male patients was 14 [10–25]. Five

patients (13.1%) did not have an erectile dysfunction (IIEF-5 range 22–25), 22 patients (55.2%) had mild erectile dysfunction (IIEF-5 range 17–21), 10 patients (26.3%) had mild to moderate erectile dysfunction (IIEF range 12–16) and 2 patients (5.2%) had moderate erectile dysfunction (IIEF range 8–11). The main global FSFI score in female patients was 24 ± 6,4. According to the FSFI, nine patients (64.2%) had sexual dysfunction. In univariate analysis, sexual dysfunction was related to age (p = 0.032), disease duration (p = 0,050) and pain (p = 0,018) in men. A significant association was found between sexual impairment and age (p = 0.019), educational level (P = 0,031), pain (0,02) and functional impairment (p = 0,04) in women.

Conclusion: Multidisciplinary programs seem to be indicated to treat the various aspects of chronic low back pain including sexual dysfunction in order to improve patient's care and quality of life.

P893
A CASE REPORT HIGHLIGHTING THE ENTRAPMENT OF THE MUSCULOCUTANEOUS NERVE: AN EASILY BUT INFREQUENTLY RECOGNIZED TUNNEL SYNDROME

M. Rachdi[1], C. Rahmani[1], R. Beji[1], B. Kallel[1], W. Elleuch[1], A. Yahya[1], S. Ghroubi[1], M. H. Elleuch[1]

[1]Physical Medicine and Rehabilitation Dept., Habib Bourguiba Hospital, Sfax, Tunisia

The musculocutaneous nerve (MCN) emerges from the lateral cord of the brachial plexus, containing fibers from the C5, C6 and C7 spinal nerve roots. It innervates the three anterior muscles of the upper arm. We report a case of an isolated MCN entrapment after heavy physical activity to highlight the clinical presentation and diagnostic criteria in order to allow early diagnosis and intervention in this condition.

Case report: We present the case of a healthy 32-year-old construction man who presented with painless left upper arm weakness after heavy manual work. Over the following days, his elbow flexion strength deteriorated. These symptoms were accompanied with dysesthesia and numbness on the radial aspect of the left forearm radiating from the elbow crease to the base of the thumb. He had no history of previous neck pain or upper limb injuries. On clinical examination, there was a visible atrophy of the left biceps with no visible contractions (Fig. 1).

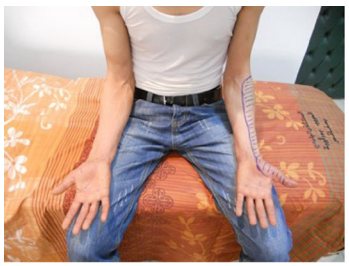


Figure 1. Normal right biceps bulk, obvious left biceps atrophy

Right upper and bilateral lower extremities were scored 5/5 according to the medical research council grading (MRC). However, the power grading of the left biceps, brachioradialis and brachialis were 2/5, 3/5 and 3/5 respectively. The left biceps reflex was absent. Sensory examination revealed a narrow zone of reduced light touch, pin and temperature appreciation in the lateral aspect of the left forearm. To confirm these findings, an electromyography (EMG) and nerve conduction studies (NCS) were performed and did indeed demonstrate a severe injury to sensory and motor components of the MCN. Acute denervation in the left biceps muscle was diagnosed with a marked decrease in the number of motor units activated. Thus, MCN tunnel syndrome was diagnosed. The patient underwent a MCN neurolysis. Post operatively, the patient had immediate return of biceps firing and improvement in numbness and dysesthesia. Elbow flexion force and arm circumference continued to improve. One year after the surgery, he had complete return of shoulder and elbow function.

Conclusion: The diagnosis of isolated MCN entrapment should be borne in mind in patients with loss of forearm flexion strength and bulk of the biceps muscle after heavy manual work.

P894
ASSESSING TREATMENT SATISFACTION IN PATIENTS WITH CHRONIC RHEUMATIC DISEASES RECEIVING BIOLOGIC THERAPIES

M. Rachdi[1], A. Feki[1], S. Ben Jemaa[1], Z. Gassara[1], M. Ezzedine[1], H. Fourati[1], M. H. Kallel[1], R. Akrout[1], S. Baklouti[1]

[1]Dept. of Rheumatology, Hedi Chaker Hospital, Sfax, Tunisia

Objective: To assess the treatment satisfaction and the underlying related factors affecting it in patients with rheumatoid arthritis (RA) and spondyloarthritis (SpA) treated with biological disease modifying antirheumatic drugs (bDMARDs).

Methods: It's a cross-sectional study including patients fulfilling the 2010 RA classification criteria and patients fulfilling the ASAS 2009 criteria for SpA diagnosis. Sociodemographic data and disease characteristics were gathered. Treatment satisfaction was evaluated via treatment satisfaction questionnaire for medication (TSQM) designed to assess patient treatment satisfaction in chronic diseases. It comprises 14 items focusing on effectiveness, side effects, convenience, and global satisfaction of the medication. A score ≥ 80 was defined as satisfied.

Results: 62 patients were enrolled: RA (n = 42; 67%), SpA (n = 20; 32.2%). 43 of them were women (88.2% of RA, 49% of SpA). Mean age was 50.4 y ⌈21–67⌉. The mean duration of education was 8.5 y. The mean of BMI was 28.1 kg/m^2 ± 2.55 and of disease duration was 10.4 y ⌈1–26⌉. 46 patients (74.1%) suffered from other physical diseases, while 9 patients had mental disease (19.5%). Mean of DAS28-ESR was 2.8 ⌈1.8–5.3⌉, of ASDAS-CRP was 1.6 ⌈1–3.5⌉ and of BASDAI was 1.4 ⌈0–5⌉. The disease's functional impact was assessed via HAQ in RA patients and via BASFI in SpA patients with a median score of 0.8 ± 0.5 and 1.5 ± 1 respectively. 38 patients (61.2%) were on intravenous biologic. Mean of TSQM summary scores were distributed as follows: treatment effectiveness 80.3 (78.5 vs. 96), side effects 41 (34.5 vs. 45), convenience of administration 70.8 (67.9 vs. 72.7), and global satisfaction 82.6 (88.3 vs. 79.4). There were statistically significant correlations between TSQM and age (p = 0.04), educational level (p = 0.031), the lower number of comorbidities (p = 0.04), DAS28-ESR (p = 0.01) and BASDAI (p = 0.012). Patients having TSQM scores ≥ 80 (n = 38, 61.2%) had a higher educational level, lower patient and physician global assessment and more remission or low activity disease rates compared to 80 or less group.

Conclusion: Treatment satisfaction was significantly associated with educational level, disease activity and the number of comorbidities in chronic rheumatic disease patients.

P895
IMPACT OF THE NUTRITIONAL STATUS ON BONE HEALTH IN RHEUMATOID ARTHRITIS PATIENTS

M. Rachdi[1], Y. Makhlouf[1], S. Miladi[1], H. Boussaa[1], A. Fazaa[1], L. Souebni[1], K. Ouenniche[1], S. Kassab[1], S. Chekili[1], K. Ben Abdelghani[1], A. Laatar[1]

[1]Dept. of Rheumatology, Mongi Slim Hospital, La Marsa, Tunisia

Objective: Well balanced nutrition, although usually overlooked in clinical practice, is required to improve both bone health and disease management, particularly in rheumatoid arthritis (RA) patients. We aimed to assess the nutritional status and determine its association with bone health in RA patients.
Methods: We conducted a cross-sectional study, including RA patients fulfilling the 2010 ACR/EULAR classification criteria. Sociodemographic data and disease related characteristics were gathered. Functional status was measured via the health assessment questionnaire (HAQ). Nutritional status was assessed via the nutrition risk screening 2002 (NRS). It is a validated tool composed of a pre-screening evaluation including 4 questions and a final screening evaluating risk of malnutrition based on: BMI, disease severity and age. A NRS score ≥ 3 indicates risk of malnutrition. DXA was used to measure the BMD of the lumbar spine and the femoral neck. Results were statistically significant if the p-value was < 0.05.
Results: 45 patients were enrolled. The mean age was 59.5 y [31–83]. There was a female predominance with a sex-ratio of 0.14 (females: 85.4%). The median disease duration was 124.7 months [6–366]. The mean DAS28-ESR was 4.07 [0.97–6.90]. The mean HAQ was 0.95 [0–3]. The mean BMI was 25.7 kg/m^2 [13.5–35.8]. Low BMD was found in 56.3% of cases (osteoporosis: 29.4% and osteopenia: 26.9%). Risk of malnutrition according to the NRS was found in 27 patients (56.3%). In the 'at risk of mal nutrition' group, there were significantly more osteoporotic patients (22 vs. 5; p = 0.04). There was a statistically significant association between an impaired nutritional status and a lower BMD expressed in T-score and g/cm^2 at the femoral neck (-2.47 $\pm$ 1.29 SD vs. -1.68 $\pm$ 1.19; p = 0.036) and the lumbar spine (0.717 g/cm^2 $\pm$ 0.193 vs. 0.870 g/cm^2 p = 0.046) respectively. Similarly, an altered nutritional status was associated with advanced age (p = 0.05), and lower BMI (p = 0.061) without reaching a statistically significant threshold. In contrast, lower NRS scores were associated with a longer disease duration(p = 0.006). BMI (OR = 1.10, p = 0.04), and disease duration (OR = 3.02, p = 0.004) were the independent determinants of low bone density in RA patients. While both advanced age (OR = 1.2, p = 0.005) and disease duration (OR = 1.9, p = 0.02) were the independent determinants of nutritional impairment.
Conclusion: Almost half of RA patients had an altered nutritional status. Predictive factors of an altered nutrition and low bone density were mainly advanced age and longer disease duration.

P896
IS THERE AN ASSOCIATION BETWEEN BREAST SIZE AND FUNCTIONAL DISABILITY IN CHRONIC LOW BACK PAIN?

Y. Makhlouf[1], M. Rachdi[2], L. Souebni[1], S. Miladi[1], A. Fazaa[1], H. Boussaa[1], K. Ouenniche[1], S. Kassab[1], S. Chekili[1], K. Ben Abdelghani[1], A. Laatar[1]

[1]Dept. of Rheumatology, Mongi Slim Hospital, La Marsa, [2]Dept. of Rheumatology, Hedi Chaker Hospital, Sfax, Tunisia

Objective: Breast hypertrophy can cause several musculoskeletal symptoms, with spinal pain being the most prevalent one [1]. We aimed to assess the association between breast size and functional disability in CLBP.
Methods: We conducted a cross-sectional study including women with CLBP. Sociodemographic and clinical data were collected. Breast size was assessed with the Sacchini index (SI) [2]. Three breast size groups were defined as follows: Hypomastia (SI < 9 cm), normal breast size (NB) (SI [9-11 cm]), and hypertrophic breast (HB) (SI > 11 cm). The severity of CLBP and the functional disability were measured via the visual analogue scale (VAS) and the Oswestry disability index (ODI) respectively. Lumbosacral spine X-rays were performed in refractory CLBP women and lumbar spinal static parameters were calculated. Statistically significant threshold was fixed for a p-value < 0.05.
Results: 56 women with a mean age of 52.4 y [23–66] were enrolled. The occupational work was distributed as follows: office work (25%) and physical labor (19.6%). The mean duration of CLBP was 8.7 y [1–24] with a mean attack frequency of 2.78 [1–7]. 38 patients were overweight while 17.8% were obese. 39 patients (69,6%) were classified as having HB while 30.3% had a NB. The mean VAS pain was 4.30 [1–7]. ODI was distributed as follows: minimal (26.7%), moderate (60.7%) and severe (12.5%). The mean measures of sacral slope, pelvic tilt, and lumbar lordotic Cobb's angles were: 50.9° [29–74], 50° [23–71] and 41.8° [22–68] respectively. Impaired postural balance was found in 32 patients. There was no significant association between HBS and lumbar lordosis (p = 0.091), pelvic tilt (0.156), sacral slope (p = 0.128), and abnormal spinal posture (p = 0.304). Similarly, HB was more frequent in patients with higher VAS and ODI scores, without reaching a statistical significance (p = 0.055 and P = 0.069) respectively. Moreover, HB and NB groups were comparable in terms of age (p = 0.113), attack frequency (p = 0.320), and disease duration (p = 0.246), although the mean BMI was higher among the HB group (29.2 vs. 24.6 kg/m^2, p = 0.002).
Conclusion: Increased breast size had a positive, yet not statistically significant impact on pain intensity and functional ability in women with CLBP. Further studies with larger sample sizes are needed to identify better the impact of breast size on this common condition.
References:
1. Zielinski G, et al. Med Og Nauk Zdr 2019;25:44.
2. Sacchini V, et al. Eur J Cancer 1991;27:1395.

P897
APPLICABILITY OF OPPORTUNISTIC CT FOR BONE AND MUSCLE ASSESSMENT IN ADULT POPULATION WITH SPINAL MUSCULAR ATROPHY

M. Rakusa[1], Z. Snoj[2], L. Leonardis[3], B. Koritnik[3]

[1]Dept. of Endocrinology, Diabetes and Metabolic Disease, Univ. Medical Centre Ljubljana, [2]Radiology Institute, Univ. Medical Centre Ljubljana, [3]Institute of Clinical Neurophysiology, Univ. Medical Centre Ljubljana, Ljubljana, Slovenia.

Objective: Spinal muscular atrophy (SMA) is hereditary, degenerative, neuromuscular disease, that leads to muscle weakness and atrophy. Number of survival motor neuron 2 (SMN2) gene copies affect severity of disease. Osteoporosis and fractures are common in SMA. Nusinersen, which is administrated intrathecally, is approved therapy for SMA. Computed tomography (CT) is often needed for planning of lumbar puncture. The aim of our study is to evaluate incidence of osteoporosis, vertebral fractures and muscle characteristics using opportunistic CT in SMA population.
Methods: We retrospectively analysed CT scans. We measured bone and muscle density in Hounsfield units (HU) and bilateral area of erector spinae muscles on L1 level. We assessed vertebral fracture according to Genant semiquantitative score. We compared measured parameters to ambulatory status and SMN2 gene copies.

Results: 17 patients with SMA type 2 and 3 patients (10 females (59%)), of median age 40 (IQR 20.5) y, had CT prior to start of nusinersen treatment. Six (35%) were ambulatory. Only 1 (6%) patient had vertebral fracture (grade 2). Median bone density was 85 (IQR 134) HU, muscle density 70 (IQR 42) HU, bilateral muscle area 26.5 (25.5) cm^2. There were overall 9 (53%) patients with low bone density, 5 (29%) with normal bone density and 3 (18%) in intermediate range. Patients with normal or intermediate bone density had 4 or 5 and patients with low bone density had 2 or 3 SMN2 copies. All patients with low bone density were non-ambulatory. Ambulatory and non-ambulatory groups were significantly different in bone density, muscle density and bilateral muscle area ($p < 0.001$, $p < 0.001$ and $p = 0.020$). Bone density and muscle density correlated with SMN2 copies (Spearman's rho 0.694, $p = 0.002$ and 0.654, $p = 0.004$, respectively).
Conclusion: CT a is useful method for assessment of bone density in SMA population. Ambulatory status and SMN2 copies are important risk factors for low bone and muscle density. Vertebral fracture incidence in our population was low. Further studies on SMA population are needed.

P898
EFFICACY OF ULTRASOUND GUIDED CAUDAL EPIDURAL STEROID INJECTION WITH OR WITHOUT OZONE IN PATIENTS WITH LUMBOSACRAL CANAL STENOSIS; A RANDOMIZED CLINICAL CONTROLLED TRIAL

M. Rayegani[1], V. Soltani[1], S. Raeissadat[1]

[1]Physical Medicine and Rehabilitation Research Center, Shohada Tajrish Medical Center, Shahid Beheshti Univ. of Medical Sciences, Tehran, Iran

Objective: Lumbosacral canal stenosis is known as the most common cause of back surgery with several complications. Selecting a minimally invasive treatment with high efficacy in such patients is necessary. This study was designed to evaluate the effectiveness of ozone therapy in combination with caudal epidural steroid in patients with lumbar spinal stenosis.
Methods: A double-blind randomized clinical trial was conducted on 50 patients with lumbar spinal stenosis allocated into two study groups. Under ultrasound guidance, the first group received 80 mg of triamcinolone hexavalent with 4 mL of Marcaine 0.5% and 6 mL of distilled water to the caudal epidural space. The second group received an injection similar to the first group, combined with 10 mL of ozone (O2-O3) gas at a concentration of 10 μg/cc. The patients were followed at baseline, one, and six months after injection with clinical outcomes measures using visual analog scale (VAS), walking distance (WD) and Oswestry disability index (ODI).
Results: The mean age of subjects, 30 males (60%) and 20 females (40%), was reported as 64.51 ± 7.19 years old. Reduction of pain intensity based on VAS score was statistically significant in both groups at follow-up periods ($P < 0.001$). The VAS changes in the first month and sixth months showed no significant difference between the two groups ($P = 0.28$ and $P = 0.33$, respectively). The improvement in disability index (ODI) in both types of treatment during follow-up was significant ($P < 0.0001$), and there was no difference between the two treatment groups in 1 month and 6 months ($P = 0.48$ and $P = 0.88$, respectively). As for walking distance, the improvement process with both types of treatment during follow-up periods was significant ($P < 0.001$). However, after 1 and 6 months of treatment, the rate of improvement in patients' walking distance in the caudal epidural steroid injection plus ozone group was significantly higher than in the epidural steroid group ($p = 0.026$ and $p = 0.017$, respectively).
Conclusion: The results of VAS and ODI outcomes showed that caudal epidural steroid injection combined with ozone has no advantage over caudal epidural steroid injection alone.

P899
BIOFEEDBACK TRAINING EFFICIENCY IN RHEUMATOID ARTHRITIS PATIENTS

R. Grekhov[1], A. Aleksandrov[1], M. Raza[2], V. Aleksandrov[1]

[1]Zborovsky' Research Institute for Clinical and Experimental Rheumatology, Volgograd State Medical Univ., Volgograd, Russia, [2]Riga Stradins Univ., Faculty of Medicine, Riga, Latvia

Objective: To increase the efficiency of complex therapy of patients with rheumatoid arthritis (RA) using biofeedback training (BFB).
Methods: We observed 90 patients with diagnosis of RA: 65 women (72,2%) and 25 men (27,8%) aging from 18–66 y. According to the objectives, RA patients were divided randomly into two groups, similar according to gender, age and duration of disease: main (n = 60) and control (n = 30). RA patients of the main and control groups received similar medicament and physiotherapeutic treatment. Besides, patients of main group received in addition 14 daily sessions of biofeedback training using Reacor—rehabilitation psycho-physiological computer device.
Results: Analysis of the dynamics of mandatory clinical and laboratory parameters of effectiveness of the therapy and their comparison in patients of the main and control groups was carried out. Score of treatment efficacy was assessed by ACR criteria (Table 1).

Table 1. Evaluating the effectiveness of treatment of RA patients with ACR criteria

Estimated parameter	Main group (n=60)	Control group (n=30)	Reliability (χ^2; p)
ACR 20	39 (65%)	13 (43,3%)	χ^2=4,12; p=0,04
ACR 50	12 (20%)	5 (16,6%)	χ^2=0,09; p=0,76
ACR 70	–	–	–

Evaluating the effectiveness of therapy by ACR 20 criteria in the main group was significantly higher than in control ($p = 0,04$). At the same time, DAS 28 authentically changed in patients of both groups (at $p < 0,001$), but these changes corresponded to 1,6 points in the main group, and 1,2 in the control that corresponds to moderate effect of anti-rheumatic therapy. When using BFB training there was a decrease of intensity of pain eventually bringing to relief and a decrease in exudative phenomena in the joints, increased joint mobility, and improved overall well-being of patients. BFB training gives the patient the opportunity to receive positive reinforcement through feedback, informing them about the development of skills of self-regulation, the patient brings a sense of satisfaction associated with the completion of self-voluntary efforts, and the awareness of the possibility of improvement. Sense of hopelessness and helplessness is replaced by feeling of the prospect, new possibilities that promotes the reduction of pain syndrome and a decrease in depression and frustration.
Conclusion: Application of biofeedback therapy enhances the effectiveness of complex therapy of RA patients by reducing pain and joint syndrome, promotes active and conscious participation of the subject in the course of therapy on the basis of self-regulation and self-control, and therefore mobilized will potential and increased self-esteem of patients. The method of BFB training is an affordable and safe treatment that can be recommended for widespread use in rheumatology practice.

P900
PSYCHOLOGICAL FORMS OF AGGRESSIVITY IN RHEUMATOID ARTHRITIS PATIENTS

R. Grekhov[1], A. Aleksandrov[1], M. Raza[2], V. Aleksandrov[1]

[1]Zborovsky' Research Institute for Clinical and Experimental Rheumatology, Volgograd State Medical Univ., Volgograd, Russia, [2]Riga Stradins Univ., Faculty of Medicine, Riga, Latvia

Objective: Rheumatoid arthritis (RA) refers to diseases with an insufficiently known pathogenesis. It remains actual to study not only immunobiological, but also psychosomatic prerequisites for its development, in particular, the study of indicators and forms of aggressiveness in RA patients, which was the purpose of this study.
Methods: 37 patients with RA in average age 44.01 ± 12.23 y were examined. The study was conducted using the Buss-Durkee Hostility Inventory (BDHI) to measure of the various aspects of hostility and guilt.
Results: It was revealed that the aggressiveness index in 56,75% of the subjects was below the norm, in 40,55% the norm of aggressiveness was revealed, and only 2,7% of patients demonstrated high levels of aggressiveness. The hostility index in 59,45% of the subjects was within the normal range, high hostility was detected in 32,43%, and hostility was low in 8,1% of patients. The data indicate that RA patients are quite hostile, but not aggressive outwardly, and hostile tendencies remain unreacted. Further, an analysis of individual forms of aggressiveness was carried out. The most characteristic form of aggression for patients is a feeling of guilt (on average 76,1 ± 21,12 points). The indicators of indirect aggression were also high (on average 59,7 ± 22,81 points). The average value in terms of resentment was 55,2 ± 22,81 points. The feeling of resentment does not contribute to the constructive response of aggressive impulses, but rather leads to their suppression and accumulation, which can also be a prerequisite for the development of psychosomatic diseases. The indicators of verbal aggression and irritation were less pronounced – on average 49,3 ± 22,35 and 47,2 ± 21,12 points, respectively. Patients are least prone to manifestations of suspicion (on average 44,9 ± 27,97 points), physical aggression (41,6 ± 25,02 points) and negativism (34 ± 23,97 points).
Conclusion: Patients with RA have a certain specificity of aggressive manifestations, which can be characterized as autoaggressive. They tend to project aggression onto their own personality, feel guilty or accumulate anger in the form of resentment, but do not actively show aggressive impulses to the outside in the form of physical aggression, etc. Patients are quite hostile to the world, they feel a threat to their own safety, but these feelings remain unreacted. Our findings indicate the need to provide RA patients not only with medication, but also with psychological help that should be aimed at overcoming self-destructive tendencies, feelings of guilt and resentment, reducing hostility, as well as developing skills for constructive response to aggressive impulses.

P901
SEVERE SARCOPENIA IN A MAN WITH INCOMPLETE SPINAL CORD INJURY

M. S. Deac[1], A. Gherle[1], D. Stoicanescu[2], M. Cevei[1], I. R. Cevei[2], A. C. Zamfir[2]

[1]Univ. of Oradea, Faculty of Medicine, Oradea, [2]Univ. of Medicine and Pharmacy "Victor Babes", Timisoara, Romania

Different factors may contribute to the loss of muscle strength and mass, leading to sarcopenia.
Case report: We describe a 58-year-old male patient with a history of an accident by falling from a 3-m height in 2020 resulting in dorsolumbar spinal cord injury. The D12-L1 fracture was operated with a posterior metal rahisynthesis. He was admitted to the Medical Rehabilitation Clinical Hospital Baile Felix, Romania for tetraparetic motor deficit. The clinical examination revealed: ASIA C score—L4 motor level. The John Health System Corporation scale established a high risk of falling, with 16 points. Functional Independence Measure scale revealed 63 points out of 126, 50%. Barthel Index for Activities of Daily Living assessing functional independence revealed 50 points out of 100 indicating severe dependence. Functional Ambulation Classification score was 2 indicating ambulation dependent on physical assistance. BMD determination using DXA from 02.09.2023 indicated osteopenia: lumbar spine Z-score:—1.5; left hip Z-score: -2.0; right hip Z-score: -1.8. ALM value was 0.5 indicating sarcopenia. Jamar hand-held dynamometer used to measure handgrip strength indicated 24 kg for the right hand and 20 kg for the left hand. Medical rehabilitation included daily kinetic program; back toning exercises; limiting weight lifting; toning exercises: weight training three times a week; postural exercises: WKO combined with tilting of the pelvis and extension of the back. Patient's compliance with all measures related to fall prevention is very important.
Conclusion: Although the spinal cord injury was at the dorsolumbar level, the muscle strength and the functionality of the upper limbs were also impaired.

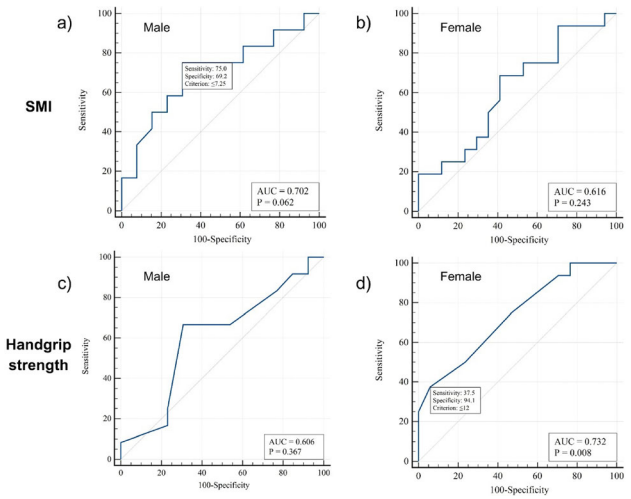
P902
PREDICTION OF LOW BONE MINERAL DENSITY BY CUT-OFF MUSCLE MASS AND STRENGTH VALUES IN ADULTS WITH JUVENILE IDIOPATHIC ARTHRITIS

M. S. Kulyk[1], A. L. Novytska[2], R. A. Potomka[2], O. I. Ivashkivsky[2], T. A. Karasevska[3], H. V. Mostbauer[3], R. L. Lories[4], K. D. V. De Vlam[4], M. B. Dzhus[5]

[1]Internal Medicine Dept. No2, Bogomolets National Medical Univ., Kyiv, Ukraine; KU Leuven, Skeletal Biology and Engineering Research Center, Leuven, Belgium, [2]Rheumatology Dept. of Communal Non-commercial Institution "Oleksandrivska Clinical Hospital", Kyiv, Ukraine, [3]Internal Medicine Dept. No2, Bogomolets National Medical Univ., Kyiv, Ukraine, [4]KU Leuven, Skeletal Biology and Engineering Research Center, Leuven, Belgium, [5]Internal Medicine Dept. No2, Bogomolets National Medical Univ.,; Rheumatology Dept. of Communal Non-commercial Institution "Oleksandrivska Clinical Hospital", Kyiv, Ukraine

Objective: To predict low BMD by cut-off muscle mass and strength values in adults with juvenile idiopathic arthritis (JIA).
Methods: This cross-sectional study in a single center, approved by the local research and ethics committees, included 58 young patients who applied to the rheumatology department. Skeletal muscle mass and BMD were determined using DXA. The skeletal muscle mass index (SMI) was defined by appendicular skeletal mass/height^2 (kg/m^2) with such thresholds for men: < 7.23 kg/m^2 and women: < 5.67 kg/m^2. Handgrip strength (HGS) was assessed using a hand dynamometer (JAMAR) with the following thresholds: < 27 kg for men and < 16 kg for women. The median value of BMD was determined for males and females to predict the decrease of BMD depending on the low muscle mass and strength. The area under the receiver operating characteristic curve (AUROC) was calculated to determine the ability of HGS and SMI to predict low BMD.
Results: For males, a decrease in BMD was defined as less than the median value (< 1.092 g/cm^2), and for females—less than the median value (< 1.028 g/cm^2). The connection between the risk of a decrease in BMD and low SMI for males was not found; AUC does not differ from 0.5 but has such a tendency ($p = 0.062$) (Fig. 1a). The connection between the risk of BMD reduction and SMI for females was not found; AUC curve does not differ from 0.5 ($p = 0.243$) (Fig. 1b).

The connection between the low BMD and decreased HGS for males was not found; AUC does not differ from 0.5 (p = 0.367) (Fig. 1c). The connection between the low BMD depending on HGS for females was found, AUC = 0.73 (95%CI 0.56—0.90) (p = 0.008) (Fig. 1d). A decrease in the risk of low BMD for females was found with increasing HGS for each unit, OR = 0.67 (95%CI 0.47–0.97).



Conclusion: The connection between low HGS and low BMD was found in female patients with JIA, which can mean the cut-off value of HGS less than 16 kg can be a helpful tool for predicting low BMD.

P903
FACTORS ASSOCIATED WITH SARCOPENIA IN YOUNG ADULTS WITH JUVENILE IDIOPATHIC ARTHRITIS

M. S. Kulyk[1], A. L. Novytska[2], R. A. Potomka[2], O. I. Ivashkivsky[2], T. A. Karasevska[3], H. V. Mostbauer[3], R. L. Lories[4], K. D. V. De Vlam[4], M. B. Dzhus[5]

[1]Internal Medicine Dept. No2, Bogomolets National Medical Univ., Kyiv, Ukraine; KU Leuven, Skeletal Biology and Engineering Research Center, Leuven, Belgium, [2]Rheumatology Dept. of Communal Non-commercial Institution "Oleksandrivska Clinical Hospital", Kyiv, Ukraine, [3]Internal Medicine Dept. No2, Bogomolets National Medical Univ., Kyiv, Ukraine, [4]KU Leuven, Skeletal Biology and Engineering Research Center, Leuven, Belgium, [5]Internal Medicine Dept. No2, Bogomolets National Medical Univ.,; Rheumatology Dept. of Communal Non-commercial Institution "Oleksandrivska Clinical Hospital", Kyiv, Ukraine

Objective: To determine the prevalence of sarcopenia and its associated factors in young adults with juvenile idiopathic arthritis (JIA).
Methods: This cross-sectional study in a single center, approved by the local research and ethics committees, included fifty-eight patients who applied to the rheumatology department. Inclusion criteria: patients with JIA, 18–44 years old. Exclusion criteria: patients with joint replacement, diabetes mellitus, obesity. Sarcopenia was defined as a decrease in muscle mass and strength. Skeletal muscle mass and BMD were determined using DXA. The skeletal muscle mass index (SMI) was defined by appendicular skeletal mass/height^2 (kg/m^2) with such thresholds for men: < 7.23 kg/m^2 and for women: < 5.67 kg/m^2. Muscle strength was assessed using a hand dynamometer (JAMAR) with the following thresholds: < 27 kg for men and < 16 kg for women. Anthropometric, clinical, and laboratory data were determined for all patients, including BMI, disease activity by Disease Activity Score (DAS28), Juvenile Arthritis Disease Activity Score (JADAS27), and functional capacity according to the Health Assessment Questionnaire (HAQ).
Results. The mean age of the patients was 24.2 ± 2.3 y. The prevalence of sarcopenia was 35/58 among patients of both sexes, 11/25 among men and 24/33 among women, respectively. The following factors associated with sarcopenia in a univariate logistic regression model were identified: male sex (odds ratio (OR) 0.29, confidence interval (CI) 0.10–0.89; p = 0.03), BMI (OR 0.73, CI 0.60–0.89; p = 0.002), DAS28 and JADAS27 indices (OR 2.44, CI 1.39–4.27; p = 0.002; OR 1.15, CI 1.04–1.27; p = 0.007, respectively), HAQ (OR 4.14, CI 1.38–12.5; p = 0.01) and femoral neck BMD (OR 0.005, CI 0.0002–0.17; p = 0.003).
Conclusion: Sarcopenia was noted in 60% of young patients with JIA. Loss of muscle mass and strength in young patients with JIA is associated with disease activity, BMI, and HAQ.

P904
MODERN TREATMENT OF OSTEOPOROSIS—DENOSUMAB: CASE REPORT

M. S. Marinkovic[1]

[1]General Hospital Uzice, Uzice, Serbia

Case report: Patient JC, 61 years old, noticed a slight flexion of the shoulder and pain in both shoulder joints. He suffers from diabetes, type—a II, on OAD therapy. The menstrual cycle stopped at the age of 45. She had a fracture of her right forearm in January 2020. The level of vitamin D was determined, which was 29.3 nmol/l, calcium level 2.56, phosphorus 1.00, PTH: 99.0, ALP: 56. In June 2020, a diagnosis of osteoporosis was made by osteodensitometry, which shows a significantly reduced bone density in terms of osteoporosis in both the hip and the spine. Prescribed therapy Prolia amp. A 60 mg, once in 6 months and vitamin D a 1000 ij, 1 tablet a day. The patient comes for the first control examination after a year, by then she received 2 Prolia ampoules, when we do the DXA examination again, in order to determine the effectiveness of the given therapy. At the first control DXA examination, it was determined that there was still a decrease in bone density both at the level of the spine and at the level of the hip, in terms of osteoporosis, but with an improvement in bone density at the level of the spine by 4.9% and 2.8% at the level of the hip. We continue the current therapy and schedule the next control examination in a year. A second follow-up with a new DXA scan shows improved bone densities at both the spine and hip levels. Bone density at the level of the spine enters the region of osteopenia (T score -2.4), which indicates an improvement in bone density compared to the first examination by 12%. On the hip, the bone density improved by 6.8% compared to the first examination, but the bone density on the hip still remains at the level of osteoporosis (T-score -2.8). Laboratory tests including a calcium level of 2.48 and a significantly improved vitamin D level of 56 nmo/l. The patient felt much better, the pain in her shoulder joints disappeared, she was in a better mood and she herself noticed that she straightened up. We continued the same therapy (Prolia amp and vitamin D), which gave a positive clinical effect, as well as an improvement in bone density on examination with an osteodensitometer. We scheduled a control examination with laboratory analyzes and a new DXA examination in 2 y.
Conclusion: In our case, the therapy with Prolia ampoules and denosumab proved to be very effective, because it improved the clinical and psychological condition of our patient, and the examination with an osteodensitometer showed a significant improvement in bone density.

P905
METABOLIC SYNDROME: A GOOD RESPONDER TO PRP INJECTION FOR KNEE OSTEOARTHRITIS TREATMENT, PROSPECTIVE COHORT STUDY

M. S. Metadilogkul[1], V. N. Virasathienpornkul[1], W. S. Wanitchakorn[1]

[1]Institute of Orthopedics, Lerdsin Hospital, Dept. of Thailand Medical Services., Bangkok, Thailand

Objective: Platelet-rich plasma (PRP) intra-articular injections have gained popularity and are suggested to be more effective and longer lasting than corticosteroid or viscosupplementation therapy. There is an increasing number of studies have found correlation between metabolic syndrome (MetS) and knee osteoarthritis. To study how metabolic syndrome state effects to an efficacy of PRP injection in the patients with KOA.
Methods: 84 patients with radiologically confirmed mild-to-moderate knee osteoarthritis who received single intra-articular PRP injections were included in a study. Parameters of MetS according to International Diabetes Federation (IDF) criteria were collected. Patient reported outcomes was measured using WOMAC)and the visual analogue scale (VAS) before the treatment, at 6 month and 12 months follow up.
Results: Significant improvements in the majority of WOMAC and VAS were found throughout the entire 12-month follow-up, following the PRP injections in both KOA with MetS and non-MetS groups. Mean difference in WOMAC total at 12 months was 48.4% and 40.7% in MetS and non-MetS groups, respectively ($p < 0.001$). Mean reduction in VAS at 12 months was 4.8 and 3.6 in MetS and non-MetS groups, respectively ($p < 0.05$).
Conclusion: Intra-articular injection of PRP alleviates symptoms and pain and improves functionality in patients with KOA. Patients with MetS have a better clinical response to PRP application. To assess metabolic syndrome state in the patients with KOA might be a benefit as prognostic factor to identify which patient will have more efficacy from this treatment intervention.

P906
CLINICAL-ANALYTICAL AND DENSITOMETRIC CHARACTERISTICS OF A COHORT OF PATIENTS WITH SEVERE OSTEOPOROSIS TREATED WITH ROMOSOZUMAB

M. S. Moreno Garcia[1], Y. Uson Rodriguez[1], E. Meriño Ibarra[2], E. Giner Serret[3], M. Arce Benavente[1], J. C. Cobeta García[4], M. D. Fábregas Canales[5], J. Ulier Bellmunt[1], G. Boselli Oporto[1], F. J. Manero Ruíz[1]

[1]Hospital Universitario Miguel Servet, Zaragoza, [2]Hospital San Jorge, Huesca, [3]Hospital Royo Villanova, Zaragoza, [4]Hospital Ernest Lluch, Calatayud, Zaragoza, [5]HOspital Barbastro, Barbastro, Huesca, Spain

Objective: Romosozumab (ROMO) is an antisclerostin antibody used in treatment of severe osteoporosis (OP). In 2022, ROMO was approved for use in Spain for the treatment of severe OP in clinical practice. In our country, there are several restrictions for its financing: women with severe OP with BMD < -3, previously treated with bisphosphonates, previous major fragility fracture in the previous 24 months, with no history of heart attack, stroke or coronary artery disease, and with low/moderate cardiovascular risk according to REGICOR (< 10%). We describe a clinical, analytical, densitometric characteristics, and cardiovascular risk factors in patients treated with ROMO.
Methods: A multicenter prospective observational descriptive study developed in rheumatology clinics in Aragon, Spain, that included patients with OP in whom ROMO treatment was initiated from 2022–2023. The following information was collected: baseline characteristics (age, sex), cardiovascular risk factors, such as: history of high blood pressure (HBP), dyslipemia (DLP), diabetes mellitus (DM) and smoking habits, the estimation of cardiovascular risk by REGICOR calculator, glomerular filtration rate, previous therapies (antiresorptives) and results of BMD pre-ROMO therapy.
Results: A total of 46 patients were included, all women with severe OP. The average age was 69.8 y. A total of 80.4% of the patients had suffered a vertebral fracture. Regarding the cardiovascular risk factors, we found: 37% high blood pressure, 37% dyslipidemia, 10.9% active smoking. Cardiovascular risk was estimated by REGICOR calculator, 2,82% patients were at low-moderate risk. It should be noted that this tool does not allow us to assess the risk in people over the age of 74 years old. All patients had good renal function (GFR 83 ml/min ± 12.2). Only in 12 patients CTX was determined with a mean of 436 pg/ml (SD 307) prior to ROMO treatment. (more data see Table 1). Previous treatment was done in 89,1% of patients, 34,8% were treated with one drug, 34% two drugs and 19,6% three drugs (bisphosphonates, denosumab and teriparatide). Concomitant treatment with calcium and D vitamin was received in 67.4% of patients. More than 50% of patients were treated with PPI. With regard to baseline BMD, the mean T-Score in the lumbar spine was -3.49 and -2.67 in femoral neck.

Table 1. Baseline characteristics of studied cohort, before treatment with romosozumab.

Variable		N=46
Age(y), mean±DE		69,8±6,49
CVRF, n (%)	HBP	17 (37%)
	DM	-
	DLP	17 (37%)
	REGICORE, mean±DE	2,82±0,85
Active smoker, n (%)		5 (10,9%)
Early menopause, n (%)		11 (23.9%)
Parental hip fracture, n (%)		8 (17,8%)
Fracture before treatment, n (%)	Vertebral	37 (80,4%)
	Vertebral Fx number, mean±DE	2,7±2,24
	Hip	3 (6,5%)
	Other fractures	13 (28,3%)
	None	4 (8,7%)
Previous treatment with corticosteroids, n (%)		5 (10,9%)
Previous treatment with SSRIs, n (%)		17 (37%)
Previous PPI treatment, n (%)		26 (56,5%)
BMD, mean±DE	T-Score L1-L4	-3,49±0,66
	T-Score femoral neck	-2,67±0.86
FRAX (%), mean±DE	Major Fx Risk	18,1±8,63
	Hip Fx risk.	8,44±7,65
Treatment before romosozumab, n (%)	Bisphosphonates	29 (63%)
	Denosumab	26 (56,5%)
	Teriparatide	20 (43,5%)
Treatment with calcium and D vitamin, n (%)		31 (67,4%)

CVFR: Cardiovascular risk factors

Conclusion: Preliminary characteristics of the cohort of patients to follow-up are described at two years (after ROMO one year and subsequent antiresorptive and densitometry at 2 years—2025).Our cohort of women treated with ROMO is characterised by severe osteoporosis with vertebral fractures, high prevalence of cardiovascular risk factors and in most cases had received previous treatment.

P907
EFFECTS OF THE COVID-19 PANDEMIC ON DIAGNOSIS AND TREATMENT OF OSTEOPOROSIS

S. Hajivalizadeh[1], M. Sanjari[1], K. Khalagi[1], M. Effatpanah[2], Z. Shahali[3], F. Hajivalizadeh[4], N. Fahimfar[1], M. Mohammadian[5], P. Montazerlotf[6], E. Hesari[1], M. J. Mansourzadeh[1], A. Ostovar[1]

[1]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [2]Pediatric Dept., School of Medicine, Imam Khomeini hospital, Tehran Univ. of Medical Sciences, [3]National Center for Health Insurance Research, [4]Center for Non-Communicable Disease Control & Prevention, Deputy of Public Health, Ministry of Health and Medical Education, [5]Dept. of Epidemiology, School of Public Health and Safety, Shahid Beheshti Univ. of Medical Sciences, [6]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: The emersion of the COVID-19 pandemic has substantially affected the management of non-communicable diseases, including osteoporosis. In this study, we investigated the impact of COVID-19 on the diagnosis and treatment of osteoporosis.
Methods: This cross-sectional study was conducted on health insurance data, which covered all 31 provinces of Iran from 2019–2021. Since COVID-19 emerged in Iran in February 2020, the number of prescribed osteoporosis-related diagnostic tests and medications were assessed before and during the pandemic. The evaluated prescriptions of tests included serum vitamin D levels, serum calcium levels, and BMD. The number of FRAX tests done with Iranian internet protocol addresses (IP addresses) between 2019–2021 were received from Sheffield University and assessed in this study. The evaluated medications were prescribed alendronates. The Mann–Whitney test and Interrupted time series analysis were used by STATA statistical software version 15. β coefficient of interrupted time series analysis was estimated as the change in the number of prescribed tests and medications before and during the COVID-19 pandemic. The research ethics committee of the Endocrinology and Metabolism Research Institute of Tehran University of Medical Sciences approved this study.
Results: Regarding osteoporosis-related prescribed tests and medications, 2,862,871 vitamin D serum levels prescriptions, 1,952,600 calcium serum levels prescriptions, 62,718 BMD prescriptions, and 388,519 alendronate prescriptions were assessed. The results of the statistical analysis are shown in Table 1. The results of interrupted time series for changing levels of prescribed diagnostic tests, medications, and FRAX after the initiation of the pandemic compared to before the pandemic (β coefficient) are demonstrated. According to them, 71,579 prescribed vitamin D serum levels and 814 prescribed calcium serum levels were added to their number before the pandemic. Unlike them, 2682 prescribed BMDs, 11,579 prescribed alendronates, and 411 FRAX decreased after the onset of the pandemic. All of the changing levels were statistically significant except for the increase in the prescription of calcium serum levels. However, the increase in the prescription of this test was statistically significant based on the Mann–Whitney test.

Table 1. Comparison of the prescription of medications and tests before and during the COVID-19 pandemic

	Bivariate analysis					Interrupted time series analysis	
	Before pandemic		During pandemic		P-value*	β coefficient	P-value
	Median	IQR	Median	IQR			
Vitamin D serum levels	741.5	359	98133	69698	<0.001	71579	0.042
Calcium serum levels	305.5	121	65296	49527	<0.001	814	0.601
BMD	2128	209	840	1224	0.047	-2682	<0.001
Alendronate	20471	1523	4578	7656	<0.001	-11579	0.002
FRAX	708	186	960	596	0.005	-411	<0.001

* Mann-Whitney test

Conclusion: The prescription of serum levels of vitamin D increased after the pandemic initiation due to the effect of vitamin D in the management of COVID-19. This study demonstrated that the emersion of the COVID-19 pandemic disrupted the diagnosis and management of osteoporosis in Iran.

P908
FRACTURE MANAGEMENT CONSIDERING OSTEOPOROSIS IN OLDER ADULTS BY PHYSICIANS: A QUALITATIVE STUDY

S. Salehi[1], M. Sanjari[2], P. Zarepour[1], F. Z. Dehestani[1], N. Fahimfar[2], A. Ostovar[3]

[1]Dept. of Epidemiology and Biostatistics, school of public health, Tehran Univ. of medical sciences, [2]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [3]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: To explain the approach of physicians in the diagnosis, treatment, and follow-up of fractures considering osteoporosis in the elderly population.
Methods: This study was a qualitative content analysis, using the conventional method. The participants were selected based on their expertise in purposive sampling methods. The semi-structured interviews were conducted with eight physicians (two general practitioners, three orthopedists, two emergency physicians, and one rheumatologist) in inpatient and outpatient clinical settings. The transcript was read line by line and coded. These codes were converted into primary and also main categories by comparing approaches. Data analysis and coding were performed simultaneously with the interviews and transcripts. Informed consent was obtained from all participants. Ethics code: IR.TUMS.EMRI.REC.1402.042.
Results: The mean age of participants was 31.75. Three of them were male and five of them were female. Data analysis led to 101 codes, 20 subcategories, and six main categories. The main category "forgotten osteoporosis in the face of the fracture" showed that physicians pay less attention to the diagnosis of osteoporosis in the initial encounter with the fracture. One of our main categories was "Treatment of fracture beforehand osteoporosis disease" which revealed that the treatment of osteoporosis is the second priority in comparison to the treatment of fracture. The main category "osteoporosis treatment during fracture treatment" explains that physicians considered osteoporosis as an effective factor during treatment and follow-up of

the fracture outcomes. "Specific characteristics of osteoporosis" is another main category that elucidates, the specialists more than general physicians, deliberate specific considerations in risk evaluation and diagnosis of osteoporosis. The osteoporosis knowledge is not adequate in the medical school curriculum and the task of osteoporosis treatment is mostly moved to specialists; these findings guide to another main category "shortage of osteoporosis in the medical curriculum". Also, the deficiency of patient education and empowerment about osteoporosis, falls, and refractures leads to the main category "Ignoring the patient with osteoporosis".
Conclusion: The study highlights the emphasis on the implementation of guidelines and pathways in clinical settings and addressing adequate education on osteoporosis in the medical curriculum.

P909
MISCONCEPTIONS ABOUT OSTEOPOROSIS IN YOUNG ADULTS: A QUALITATIVE STUDY

M. Ramezanzade[1], M. Sanjari[2], S. Fahimifar[1], N. Fahimfar[2], A. Ostovar[3]

[1]Dept. of Knowledge and Information Science, Faculty of Management, Univ. of Tehran, [2]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [3]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Osteoporosis is a common metabolic disease that causes bone loss and fractures. One of the most important factors that can prevent osteoporosis is the elimination of common misconceptions in society and the general public. The purpose of this qualitative research is to illustrate the false beliefs in healthy young adults.
Methods: This study is a qualitative content analysis in which data was collected through semi-structured interviews. The 11 participants including young people aged 20–40 were selected through convenience and purposive sampling methods. The average interview time is 30 min. The interviews were recorded and transcribed verbatim. To familiarize with the interviews, their text was studied several times and finally analyzed by conventional content analysis. The transcript was read line by line and coded. These codes were converted into subcategories and also main categories by comparing approaches. Ethics code: IR.TUMS.EMRI.REC.1402.001.
Results: Qualitative data analysis led to a total of 291 codes, 17 subcategories, and 7 main categories. The main category "Osteoporosis in the frame of ignorance and disbelief" includes the beliefs that the disease is not serious and individuals' ignorance of osteoporosis. The main category of "misunderstanding of risk factors", includes false opinions about the effect of inappropriate personal and environmental conditions, genetics, and obesity on the catch the disease. The untrue beliefs regarding the prohibition of dairy product consumption in patients with kidney and digestive diseases as well as the benefit of consumption of meat and bone-containing foods because they strengthen bones, leads to another main category "Improper usage of food". The main category of "Amateurish bone protection with traditional medicine" includes uninformed use of traditional medicine and herbal medicine to prevent osteoporosis and treatment of minor fractures. "Living in the dark shadow of osteoporosis", as the main category, includes unreal fears and concerns about the consequences of osteoporosis, such as the underlying cause of other diseases, and disrupting the normal life process of the affected person. Also, the incorrect views include failure of the bone healing after fracture and unavoidable disability after fracture leads to another main category "Detachment of life after fracture". The last main category "health literacy is the missing linkage", which includes obtaining incorrect health information from invalid cyberspace and platforms.
Conclusion: Accordingly, to prevent osteoporosis, it is necessary to identify existing false beliefs and provide awareness programs such as campaigns to reduce the rate of these misconceptions and replace them with proper and valid health information and behaviors.

P910
OSTEOPOROSIS MANAGEMENT VIRTUAL COURSE: A QUASI-EXPERIMENTAL STUDY ON THE PRINCIPLES OF OSTEOPOROSIS MANAGEMENT

E. Hesari[1], M. Sanjari[1], N. Fahimfar[1], F. Hajivalizadeh[2], M. Aalaa[3], M. Amini[1], M. J. Mansourzadeh[1], M. Darman[2], H. Ghajari[4], S. Hajivalizadeh[1], A. Ostovar[5], K. Khalagi[6], B. Larijani[7]

[1]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [2]Center for Non-Communicable Disease Control & Prevention, Deputy of Public Health, Ministry of Health and Medical Education, [3]Dept. of e-learning in Medical Education, School of Medicine, Tehran Univ. of Medical Sciences, [4]Dept. of Epidemiology, School of Public Health and Safety, Shahid Beheshti Univ. of Medical Sciences, [5]Dept. of Epidemiology and Biostatistics, School of Public Health, Tehran Univ. of Medical Sciences, [6]Obesity and Eating Habits Research Center, Endocrinology and Metabolism Molecular -Cellular Sciences Institute, Tehran Univ. of Medical Sciences, [7]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Osteoporosis leads to fractures, and disability and imposes a large economic burden on health systems. Therefore, it is necessary to retrain and empower the healthcare providers to prevent and manage Osteoporosis and complications. In this study, the effect of virtual training on the principles of osteoporosis management was investigated.
Methods: The semi-experimental study was conducted on general practitioners who participated in the osteoporosis management virtual course. The sampling method was convenient. The subjects of this study were general practitioners and family physicians from various regions of the country. During this training course, general practitioners had access to the 5 main modules and 22 submodules and received and studied the educational materials offline within one month. The pre-test and post-test were provided to the participants. At the end of the course, the questionnaires "Evaluation of attitude, perception and perceived Barriers" and "Evaluation of electronic modules quality" were provided to the participants. Descriptive data were reported with frequency and percentage. SPSS and Excel software were used for data analysis. Ethics code: IR.TUMS.EMRI.REC.1401.125.
Results: In general, 498 physicians participated in the virtual training program on the principles of osteoporosis management. The average age of the participants was 35 y and $> 70\%$ of the participants were women. The average scores of the participants in all 5 modules increased from 38 to about 83 and more than doubled ($P < 0.001$) (Table 1). In total, more than half of the participants agreed and fully agreed that the virtual course system of the principles of osteoporosis management has good quality, information and services. The mean and standard deviation of the perceived readiness score among the participants was reported as 11.9 ± 2.4. Also, about 40% of physicians had the necessary preparation, computer skills, and technical support to participate in virtual training courses. The mean and standard deviation of the total score of perceived obstacles among the participants was reported as 19.3 ± 4.6.

Table 1. The effectiveness of virtual training on the principles of osteoporosis management for physicians

P value	Mean (SD) post-test scores	Mean (SD) pre-test scores	Module type
<0.001	84.9(10)	40.0(21.9)	Module 1: Bone measurement and fracture risk assessment
<0.001	83.3(9.5)	39.4(11.5)	Module 2: Diagnosis of osteoporosis
<0.001	82.1(9.6)	38.3(10.9)	Module 3: Clinical management
<0.001	81.7(8.9)	35.5(10.6)	Module 4: Monitoring and follow-up
<0.001	82.2(9.2)	36.8(11)	Module 5: Sarcopenia

Conclusion: The virtual course on the principles of osteoporosis management held for general practitioners had a significant impact on increasing the awareness and positive attitude of the participants. In general, the virtual course system of the principles of osteoporosis management was of good quality.

P911
OSTEOPOROSIS DIAGNOSIS AND TREATMENT GAP IN IRANIAN OLDER ADULTS: PROSPECTIVE FOLLOW-UP OF PARTICIPANTS IN THE IRANIAN MULTICENTER OSTEOPOROSIS STUDY (IMOS), 2021–2022

M. J. Mansourzadeh[1], M. Sanjari[1], M. Ahmadi[1], N. Fahimfar[1], V. Mohseni[1], K. Khalagi[2], S. Hajivalizadeh[1], F. Hajivalizadeh[3], E. Hesari[1], A. Ostovar[4]

[1]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [2]Obesity and Eating Habits Research Center, Endocrinology and Metabolism Molecular-Cellular Sciences Institute, Tehran Univ. of Medical Sciences, [3]Center for Non-Communicable Disease Control & Prevention, Deputy of Public Health, Ministry of Health and Medical Education, [4]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Osteoporosis poses a significant health challenge for aging populations worldwide. This study aimed to assess the diagnosis and treatment gap in Iranian older adults aged $\geq$ 50, shedding light on factors influencing awareness and adherence to osteoporosis management.

Methods: The study included 1416 participants from the 2021 IMOS national survey, who were followed up for a median duration of 1.8 y. BMD assessments were conducted in the baseline phase. The diagnosis gap, defined as the proportion of individuals with osteoporosis symptoms who have not been diagnosed before, and the treatment gap, defined as the proportion of eligible patients not receiving prescribed medication, were evaluated. Factors contributing to these gaps were explored, including patient awareness and adherence patterns to osteoporosis treatment.

Results: The mean (SD) age of the participants was 61.25 (7.88) y, with 643 (45.41%) being men. Among these participants, 908 (64.86%) visited a doctor to discuss their BMD results. Of the 908 individuals consulting a doctor, 404 (44.49%) were diagnosed with osteoporosis (299 (74.01%) women and 105(25.99%) men). Notably, only 74 of these individuals were aware of their condition before the study. So, the diagnosis gap was calculated as approximately 81.68%. Of the diagnosed individuals, 239 were prescribed osteoporosis medications, making the treatment gap identified as 40.85%. Examining medication adherence among those prescribed, merely 72 out of 239 maintained regular drug intake, resulting in an adherence rate of 30.13%.

Conclusion: These results underscore the challenges in the osteoporosis management continuum, with a substantial number of individuals experiencing a gap in both diagnosis and treatment. The results emphasize the need for targeted interventions to enhance awareness, facilitate timely diagnosis, and improve adherence to prescribed medications, addressing the overall osteoporosis care gap in the Iranian older adult population.

P912
IMPACT OF EXCESSIVE GESTATIONAL WEIGHT GAIN ON BONE REMODELING AND SUBCLINICAL ATHEROSCLEROSIS

M. Shargorodsky[1], M. M. Mashavi[2]

[1]Assuta Hospital, Ramat Hachayal, [2]Wolfson Medical Center, Holon, Israel

Objective: Gestational weight gain (GWG) has been related to altering future weight gain curve and increased risks of obesity later in life. Obesity may adversely impact bone health and vascular atherosclerotic changes, and as a result, may promote two major disorders: osteoporosis and cardiovascular disease. Noninvasive arterial testing such as ultrasonographic measurement of carotid IMT is considered a surrogate for systemic atherosclerotic disease burden and is predictive of cardiovascular events. Osteoprotegerin (OPG), a member of the TNF superfamily, exerts osteoprotective effects by inhibiting osteoclast differentiation and activation and is involved in both pathological processes: bone remodeling and vascular inflammation. Currently there is no consistent evidence regarding vascular and bone influence of excessive GWG. The present study was designed to investigate the impact of gestational weight gain on bone remodeling using OPG and P1NP and early atherosclerotic changes using IMT.

Methods: The study group consisted of 59 pregnant women who has been divided into two groups: Group 1 included 32 women with pregnancy weight gain within recommended range; Group 2 included 27 women with excessive weight gain during pregnancy. Blood sampling for bone markers, including osteoprotegerin and P1NP, was performed. The IMT was measured from non-diseased intimal and medial wall layers of the carotid artery on both sides (Apogee CX Color, ATL).

Results: In subjects with excessive compared to recommended pregnancy weight, circulating OPG was significantly lower (203.2 ± 155.1 vs. $90.0 = /-23.3$, $p < 0.001$) and IMT level was significantly higher (0.6 ± 0.1 vs. 0.7 ± 0.1, $p = 0.028$). P1NP was marginally lower in excessive GWG compared to Group 1 ($p = 0.057$). In multiple linear regression analysis, significant by-group differences in terms of these parameters persisted even after adjustment. Additionally, excessive GWG was associated with a higher rate of placental lesions related to fetal vascular malperfusion as well as rate of neonatal complications.

Conclusion: Excessive weight gain during pregnancy is associated with an adverse effect on subclinical atherosclerosis and bone health as well as placental vascular circulation. The precise mechanism for these vascular and bone remodeling changes, as well as the overall clinical impact of weight control during pregnancy deserves further investigation.

P913
DELINEATING THE OSTEOGENIC POTENTIAL OF BIFIDOBACTERIUM LONGUM DERIVED EXTRACELLULAR VESICLES IN PREVENTING GLUCOCORTICOID INDUCED OSTEOPOROSIS EX VIVO

M. Sharma[1], R. K. Srivastava[1]

[1]All India Institute of Medical Sciences, Delhi, India

Objective: Glucocorticoids are anti-inflammatory steroid medications widely used for the treatment of various inflammatory conditions like

RA, SLE, colitis, cancer, COVID-19, etc. Prolonged glucocorticoids usage is known to increase the risk of osteoporosis. Glucocorticoid induced osteoporosis (GIOP) is the most common cause of secondary osteoporosis & iatrogenic osteoporosis. The role of probiotics in modulating bone health has already been established by our group. But to date, the role of probiotics in ameliorating GIOP is relatively unexplored. One of the mechanisms by which probiotics regulate bone health is via the release of extracellular vesicles. We aimed to investigate the potential of probiotic *Bifidobacterium longum* derived extracellular vesicles (BL-EVs) in enhancing osteoblastogenesis in dexamethasone (DEX) treated MC3T3-E1 cell line and murine bone marrow mesenchymal stem cells (BMSCs).

Methods: Extracellular vesicles were isolated from *B. longum* culture medium by ultracentrifugation and characterized by nanoparticle tracking analysis (NTA) and transmission electron microscopy (TEM). Effect of DEX & BL-EVs on the cell viability of MC3T3-E1 and murine BMSCs was evaluated via MTT assay. For osteoblastogenesis, MC3T3-E1 cells and murine BMSCs were cultured in osteoblastogenic medium and treated with DEX; DEX + BL-EVs. ALP, ARS staining & qRT-PCR were performed to evaluate osteoblastogenesis.

Results: DEX treatment significantly decreased the cell viability of MC3T3-E1 and BMSCs in a dose dependent manner while no significant change in cell viability was observed in BL-EVs treated cells. Moreover, Osteoblastogenesis was significantly decreased in DEX treated MC3T3-E1 cells and BMSCs. Interestingly, in the presence of BL-EVs, osteoblastogenesis was significantly increased in DEX treated MC3T3-E1 and BMSCs as indicated by ALP and ARS staining of osteoblast cells and qRT-PCR of osteoblastogenic genes: Runx2, ALP and bglap.

Conclusion: Taken together, our results for the first time establish the osteoprotective potential of probiotic BL-EVs in preventing GIOP via modulating the effects of DEX on bone forming (osteoblasts) cells ex vivo. Our results thereby propose probiotic EVs as a viable therapy for the management and treatment of GIOP.

P914
VITAMIN D DEFICIENCY IN MIDDLE-AGED JAPANESE WOMEN

M. Shibata[1], S. Kanie[1], H. Todoroki[1], A. Kakita[2], T. Takayanagi[1], T. Konagaya[3], A. Suzuki[1]

[1]Dept. of Endocrinology, Diabetes and Metabolism, Fujita Health Univ., Toyoake, [2]Dept. of Joint Research Laboratory of Clinical Medicine, Fujita Health Univ. Okazaki Medical Center, Okazaki, [3]Marine Clinic, Nagoya, Japan

Objective: For primary prevention of osteoporosis, it should be effective to assess bone fragility from younger age. However, the rate of screening test for osteoporosis in relatively young populations around menopause is lower than other lifestyle-related diseases.

Methods: The study included women aged 40 and older but less than 70, who underwent bone check-ups from January 2021, to October 2022. BMD at the distal 1/3 of the radius was measured using DXA, and serum levels of Ca, P, creatinine, bone-specific alkaline phosphatase (BAP), 25-hydroxyvitamin D [25(OH)D], as well as urinary Ca, P, and creatinine, were measured. Morphological vertebral fractures were evaluated using plain X-rays.

Results: A total of 211 subjects (mean age: 54.8 ± 5.6 y) were enrolled in this study. Morphological changes of vertebral bodies were found in 9 individuals without past history of clinical vertebral fracture. Mean BMD at distal radius was 0.601 ± 0.088 g/cm^2. According to the diagnostic criteria in Japan, 11 subjects were diagnosed as osteoporosis. Serum 25(OH)D levels were < 10 ng/mL in 34 cases, 10 ng/mL or more but < 15 ng/mL in 81 cases, 15 ng/mL or more but < 20 ng/mL in 65 cases, and 20 ng/mL or more in 31 cases. There was no correlation between serum 25(OH)D and BAP. BAP had a positive correlation with age and showed a negative association with BMD.

Conclusion: Vitamin D deficiency is observed throughout the year in middle-aged Japanese women. Although 25(OH)D levels did not directly correlate with BAP, nutritional guidance for bone health should be initiated from younger age.

P915
MUSCLE STRENGTH IN MEN WITH ANDROGEN DEPRIVATION THERAPY

M. Siderova[1], S. Radev[1]

[1]Univ. Hospital St. Marina, Dept. of Endocrinology, Varna, Bulgaria

Objective: In recent years, prostate cancer has been the most commonly diagnosed type of cancer among the male population. Androgen deprivation therapy (ADT) is an increasingly used therapeutic regimen, not only for metastatic but also for localized prostate cancer. Side effects of ADT include different clinical outcomes, including reduced muscle mass and physical strength. Furthermore, a plenty of recent studies show a strong relationship between sarcopenia and osteoporosis, since they share common risk factors and both increase fracture risk. The aim of this study was to analyze handgrip strength value as a screening tool for sarcopenia and testosterone levels in prostate cancer patients treated with ADT and age-matched healthy men.

Methods: We included 20 male patients with prostate cancer treated with ADT (age 67,7 ± 7,5 y) and 14 healthy men (age 64,4 ± 7,1 y). All subjects performed a handgrip dynamometer test (HGD) as a test for muscular strength. Each individual performed 3 trials of the HGD test, after which the average value of both hands was recorded. Testosterone levels were measured in the morning of the day of the handgrip test for all participants.

Results: The mean testosterone level was 0,69 ± 0,1 nmol/l in the patients' group and 14,30 ± 4,38 nmo/l (CI 11,92–16,68 nmol/l) for the control group, respectively. The mean handgrip strength was significantly lower among the prostate cancer patients with ADT (31,53 ± 6,58 kg) compared to the control group (39,28 ± 4,88 kg) (p-value < 0,05). Furthermore, we found strong positive linear correlation between the testosterone value and handgrip strength measurement (p-value < 0,05, R = 0,766).

Conclusion: Our results emphasize that low handgrip strength, as a simple diagnostic tool for muscle strength and a screening tool for sarcopenia, could be associated with a low levels of testosterone. This may contribute to increased tendency to falls, frailty and fracture risk among men.

P916
SPECIFICITIES OF INFECTIOUS SPONDYLODISCITIS IN DIABETIC PATIENTS

M. Slouma[1], M. Dhifallah[1], R. Dhahri[1], L. Metoui[1], R. Battikh[2], I. Gharsallah[1]

[1]Rheumatology Dept., [2]Infectious Disease Dept., Military Hospital of Tunis, Tunis, Tunisia

Objective: Diabetes mellitus represents an immune-compromised condition, leading to a significant prevalence of this comorbidity in patients with infectious spondylodiscitis (ISD). The objective of our study was to determine the characteristics of ISD in diabetic patients.

Methods: We conducted a retrospective study in a rheumatology department over 7 y [2016–2023] with infectious spondylodiscitis

diagnosed based on clinical, bacteriological, and imaging features. Patients were divided into 2 groups: diabetic (G1) and non-diabetic patients (G2). We compared the epidemiological, clinical, biological, and radiological features between the 2 groups.

Results: Our study comprised 23 diabetic patients diagnosed with ISD, including 12 men and 11 women with a mean age of 61.83 ± 9.75 y [23–43]. The average duration of symptom evolution was 3 ± 3.17 months, characterized by back pain (n = 20), alteration of the general state (n = 8), and fever (n = 8). MRI identified disc and adjacent endplate signal abnormalities in all patients, canal abscess (n = 8), paravertebral soft tissues abscess (n = 15), epiduritis (n = 13), and spinal cord compression (n = 5). Elevated inflammatory markers were present in 76% (n = 16). The mean C-reactive protein (CRP) was 83.05 ± 93.09 mg/l, and the mean erythrocyte sedimentation rate (ESR) was 67.65 ± 29.43 mm/h. The implicated pathogens were distributed as follows: Mycobacterium tuberculosis (n = 10), common bacteria (3 Staphylococcus, 2 Streptococcus, 2 Enterococcus, 1 Escherichia coli), Candida albicans (n = 1) and Brucella (n = 1). No pathogen was identified in 3 patients. The age of diagnosis was significantly higher in diabetic patients (61.83 vs. 55.37, p = 0.042). However, no significant difference was found regarding the diagnostic delay (p = 0.697), CRP levels (p = 0.817) or ESR levels (p = 0.588). Diabetes was not associated with a higher prevalence of fever (p = 0.461) or back pain (p = 0.353).

Conclusion: Diabetes mellitus is one of the recognized risk factors for infectious spondylodiscitis. However, this comorbidity doesn't seem to affect clinical presentation or biological findings of this disease.

P917
PRO-INFLAMMATORY CYTOKINES AND MATRIX METALLOPROTEINASE-3 IN RADIOGRAPHIC AXIAL SPONDYLOARTHRITIS: AN ASSOCIATION WITH STRUCTURAL DAMAGE AND FUNCTIONAL IMPAIRMENT

M. Slouma[1], S. Bouzid[1], L. Kharrat[2], A. Tezeghdenti[3], R. Dhahri[1], E. Ghazouani[3], I. Gharsallah[1]

[1]Rheumatology Dept., Principal Military Hospital of Instruction, Tunis, [2]Rheumatology Dept., M.T Kassab of Orthopedics Institute, Ksar Saïd, [3]Immunology Dept., Principal Military Hospital of Instruction, Tunis, Tunisia

Objective: Pro-inflammatory cytokines play a crucial role in the pathophysiology of spondyloarthritis (SpA) via the IL-17/IL-23 axis. Some studies also suggested the role of matrix metalloproteinase-3 (MMP-3) in SpA [1,2]. We aimed to assess the associations between serum levels of pro-inflammatory cytokines, MMP-3, and disease assessment tools in radiographic axial SpA.

Methods: A cross-sectional study was conducted, including patients followed for radiographic axial SpA meeting the ASAS 2009 criteria. The Bath Ankylosing Spondylitis Radiology Index (BASRI) was used to assess structural damage, while the Bath Ankylosing Spondylitis Metrology Index (BASMI) was used to evaluate axial mobility. The Bath Ankylosing Spondylitis Functional Index (BASFI) was calculated to assess functional impairment. Erythrocyte sedimentation rate (ESR) and C-reactive protein level were measured. Serum levels of interleukins IL-1, IL-6, IL-8, IL-17, IL-23, TNFα, and MMP-3 were also measured.

Results: We included 32 patients with a mean age of 44.84 ± 11.21 y. The mean disease duration was 8.94 ± 7.49 y. The mean ESR and CRP level were 35 ± 26.83 mm and 10.99 ± 22.89 mg/L, respectively. The mean IL-1, IL-6, IL-8, and TNFα levels were 11.88 ± 27.36, 11.88 ± 49.79, 15.97 ± 23.24, and 19.19 ± 27.36 pg/mL, respectively. The mean IL-17 and IL-23 levels were 88.94 ± 79.40 and 14.89 ± 25.19 pg/mL respectively. The mean MMP-3 level was 23.48 ± 29.65 ng/mL. IL-6 was significantly correlated to IL-1 (r = 0.788, p = 0.001), ESR (r = 0.408; p = 0.023), BASFI (r = 0.410; p = 0.024), and BASMI (r = 0.390; p = 0.028). Furthermore, IL-1 was associated with more severe structural damage, as evidenced by a BASRI score > 3 (OR = 1.625, IC95% [1.057–2.497], p = 0.006). However, no correlations were noted between MMP-3 level and pro-inflammatory cytokines levels.

Conclusion: IL-6 level was associated with functional impairment and limitation of axial mobility in SpA. Moreover, IL-1 level was associated with structural damage. These results suggest the usefulness of these biomarkers in predicting SpA prognosis.

References:

1. Chen CH, et al. Rheumatology (Oxford) 2006;45:414
2. Zhu Y, et al. Mol Genet Genomic Med 2019;7:e00752

P918
ROLE OF PRO-INFLAMMATORY CYTOKINES IN PSORIATIC ARTHRITIS

M. Slouma[1], M. Dhifallah[1], L. Kharrat[2], A. Tezeghdenti[3], R. Dhahri[1], E. Ghazouani[3], I. Gharsallah[1]

[1]Rheumatology Dept., Principal Military Hospital of Instruction, Tunis, [2]Rheumatology Dept., M.T Kassab of Orthopedics Institute, Ksar Saïd, [3]Immunology Dept., Principal Military Hospital of Instruction, Tunis, Tunisia

Objective: Psoriatic arthritis (PsA) is a chronic immune-related inflammation that affects joints, enthesis, skin, and nails. Its pathophysiology is complex and implicates several cytokines [1]. We aimed to determine the pro-inflammatory cytokines serum levels in psoriatic arthritis and their relationship to the disease activity.

Methods: We conducted a cross-sectional study that compared patients diagnosed with psoriatic arthritis (G1) meeting the Assessment of SpondyloArthritis international society (ASAS) 2009 criteria with healthy controls (G0). Sociodemographic parameters were collected. Disease activity was assessed using the Ankylosing Spondylitis Disease Activity Score (ASDAS) and the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) for axial involvement, and the Disease Activity Score in 44 joints (DAS44) for peripheral articular involvement. We measured serum levels of the following cytokines: interleukin IL-17, IL-23, IL-22, IL-1, IL-6, and TNFα as well as C-reactive protein (CRP) level.

Results: A total of 62 subjects were included. Each group included 31 patients. G1 included 21 men and 10 women and G0 included 24 men and 7 women. The mean age was 47.29 ± 15.55 y in G1 and 43.193 ± 9.31 y in G0 (p = 0.124). In G1, the mean BASDAI and ASDAS-$_{CRP}$ were 3.72 ± 1.96 and 2.91 ± 1.41, respectively. The mean DAS44-$_{CRP}$ was 3.81 ± 1.4. The following cytokines were significantly higher in patients with PsA patients compared to controls: IL-1 (G1 = 5.75 vs. G0 = 4 pg/mL, p = 0.028), IL-17 (G1 = 116.74 vs. G0 = 1.08 pg/mL, p < 0.001), IL-22 (G1 = 47.12 vs. G0 = 10.63 pg/mL, p = 0.001), and IL-23 (G1 = 27.27 vs. G0 = 1.59 pg/mL, p < 0.001). We noted that IL-6 level was correlated to CRP level (r = 0.386, p = 0.032), DAS44-CRP (r = 0.554, p = 0.009), and ASDAS-CRP (r = 0.469, p = 0.037), Furthermore, TNFα level was correlated to BASDAI (r = 0.543, p = 0.016). ASDAS$_{CRP}$ was also correlated to IL-1 (r = 0.448, p = 0.048), IL-17 (r = 0.451, p = 0.046), and IL-22 (r = 0.464, p = 0.039) serum levels.

Conclusion: IL-17/IL-23 axis-related pro-inflammatory cytokines were significantly higher in PsA patients compared to controls.

Interestingly, these cytokines levels were correlated to disease activity suggesting their potential as therapeutic targets.
Reference: (1) Akhter S, et al. Curr Pharm Des 2023;29:2078.

P919
WORKPLACE FOOTWEAR HABITS AMONG MEDICAL RESIDENTS: A NATIONAL SURVEY

W. Lahmar[1], M. Slouma[1], R. Dhahri[1], I. Gharsallah[1]

[1]Military Hospital of Tunis, Tunis, Tunisia

Objective: Shoes play a crucial role in maintaining stability and comfort for healthcare practitioners throughout their work. Physicians, in particular, often spend long hours on their feet and may be at risk of musculoskeletal complaints, such as foot pain. Despite their significance, few studies have explored this issue. The aim of our work was to understand the footwear habits of healthcare professionals and their impact on health and safety at work.
Methods: A cross-sectional study conducted through an online self-administered questionnaire distributed to medical residents working in various Tunisian hospitals. Data collected included sociodemographic factors, work characteristics, and footwear habits during regular work hours and on duty. The questionnaire was distributed to participants online via Google Forms, ensuring anonymous and confidential responses.
Results: 282 residents responded, with a mean age of 27.98 $\pm$ 2.10 y [24–41] and a gender ratio (F/M) of 3.5. The average BMI was 23.24 $\pm$ 3.76 kg/m^2 [15.24–42.9]. Two respondents (0.7%) had diabetes, and 4 (1.4%) had chronic inflammatory rheumatism. 204 (86.9%) experienced foot pain in the workplace. 41 (14.5%) residents were in a surgical specialty, and 87 (30.9%) were in an intensive medical specialty. They worked, on average, < 40 h/week in 40.8% of cases, and 57 residents (20.2%) worked > 48 h/week. 155 participants (55%) worked 3–6 night shifts/month. During regular work hours, they wore running shoes, commercial shoes, commercial clogs, and orthopedic clogs in 46 (16.3%), 108 (38.3%), 19 (6.7%), and 16 (5.7%) cases, respectively. On duty, they wore running shoes, commercial shoes, commercial clogs, and orthopedic clogs in 39 (13.8%), 31 (11%), 101 (35.8%), and 65 (23%) cases, respectively. Residents wearing commercial clogs were found to have less foot pain ($p = 0.061$).
Conclusion: Foot pain is common among medical residents in the workplace. These results emphasize the importance of considering the choice of work shoes for healthcare professionals to minimize foot pain and promote their comfort and safety at work.

P920
MAPPING FOOT AND ANKLE PAIN AMONG MEDICAL RESIDENTS

W. Lahmar[1], M. Slouma[1], R. Dhahri[1], I. Gharsallah[1]

[1]Military Hospital of Tunis, Tunis, Tunisia

Objective: Foot and ankle pain is a common issue among healthcare professionals who spend long hours standing during shifts, daily rounds, or in the operating room. These pains can be indicative of underlying and more severe problems. Therefore, it is crucial to understand the location of the pain and propose preventive measures and effective treatments. This study aimed to describe the location of foot and ankle pain among Tunisian medical residents.
Methods: A cross-sectional study was conducted using an online self-administered questionnaire distributed to medical residents working in various Tunisian hospitals. Collected data included sociodemographic factors, work characteristics, the presence of foot and/or ankle pain, and the pain location specified using a foot diagram dividing the feet and ankles into 26 zones. Participants with foot pain were asked to choose the corresponding number for the painful area. The questionnaire was distributed online, allowing for anonymous and confidential responses.
Results: Our study included 282 residents: 62 males and 220 females. The mean age was 27.98 $\pm$ 2.10 y [24–41]. The mean BMI was 23.24 $\pm$ 3.76 kg/m^2 [15.24–42.9]. 205 reported foot pain at work. Among them, 41 (14.5%) residents were in surgery, and 87 (30.9%) were in intensive medical specialties. The reported painful regions are summarized in Table 1.

Table 1. Pain region frequency on the foot and ankle

Foot region		Right foot	Left foot
Forefoot	Big toe (n(%)	7 (2.5)	10 (3.5)
	Second toe (n(%)	8 (2.8)	5 (1.8)
	3rd,4th and 5thtoe (n(%)	11(3.9)	12 (4.3)
	1st metatarsal head (n(%)	8 (2.8)	4 (1.4)
	2nd metatarsal head (n(%)	0	0
	3,4 and 5th metatarsal head (n(%)	5 (1.8)	4 (1.4)
Midfoot	Medial midfoot (n(%)	8 (2.8)	4 (1.4)
	Lateral midfoot (n(%)	3 (1.1)	5 (1.8)
Hindfoot	Inferior talar region (n(%)	15 (5.3)	12 (4.3)
	Posterior talar region (n(%)	4 (1.4)	3 (1.1)
Ankle (n(%)		17 (6)	15 (5.3)

Conclusion: More than three-quarters of medical residents reported foot pain at work, with the most frequent painful regions being the big toe and the lower heel region. This aligns with epidemiological studies in the general population, which suggest that hallux valgus and plantar fasciitis are the most common causes of foot pain.

P921
AGING AND HEPATIC FIBROSIS: A RISK ALLIANCE IN PATIENTS WITH RHEUMATOID ARTHRITIS

W. Lahmar[1], M. Slouma[1], R. Dhahri[1], I. Gharsallah[1]

[1]Military Hospital of Tunis, Tunis, Tunisia

Objective: Hepatic fibrosis results from scar tissue accumulation in the liver, leading to impaired liver function and, ultimately, cirrhosis. Age is a known risk factor for fibrosis progression in patients with chronic viral liver disease. We aimed to evaluate hepatic fibrosis using non-invasive methods in rheumatoid arthritis (RA) patients and assess the age effect on the liver in rheumatic patients.
Methods: A single-center cross-sectional study included RA patients diagnosed according to the ACR-EULAR 2010 criteria. Demographic, clinical, and disease characteristics (duration/disease activity using DAS28CRP) were collected. Noninvasive hepatic fibrosis assessment included FIB-4 score [(age (y) $\times$ AST (U/L)/platelets (PLT) (10^9/L) $\times \sqrt{}$ALT (U/L)], with FIB-4 < 1.3 indicating a negative predictive value for hepatic fibrosis, and FIB-4 > 2.67 suggesting severe fibrosis. Liver elasticity was evaluated by fibroscan, with > 6 kPa indicating early fibrosis.
Results: Out of 73 patients (52 women, 21 men) with a mean age of 51 [22–83] y, mean disease duration was 8.5 y [0.25–31]. Disease was erosive in 70% (n = 51), with positive immunological status in 86% of the cases (n = 63). Mean DAS28CRP was 3.93 $\pm$ 1.4 [0.93–6.94], and 53 patients (72%) had active disease. Mean FIB-4 score was 0.97 $\pm$ 0.54 [0.2–2.79]; it was < 1.3 in 68% (n = 50), and > 2.67 in one patient. Mean liver elasticity was 4.5 kPa $\pm$ 1.52[2.6–12]; 12% (n = 9) had fibrosis using fibroscan. Univariate analysis showed a strong positive correlation between age and FIB-4 ($r = 0.634$, $p < 0.001$) and age and liver elasticity ($r = 0.234$, $p = 0.046$). In multivariate analysis, age > 60 y was an independent factor associated with fibrosis detected by fibroscan (OR: 22.703; 95%CI

[1.238–416.487]; p = 0.035). No association was found with prolonged disease duration.
Conclusion: The study highlights age as a factor influencing hepatic fibrosis development in RA patients. Those aged over 60 have an increased risk, regardless of rheumatic disease duration, emphasizing the need for careful liver function monitoring.

P922
MANAGING GLUCOCORTICOID-INDUCED OSTEOPOROSIS

F. L. Popa[1], R. P. Ristea[2], M. Stanciu[3]

[1]Lucian Blaga Univ. of Sibiu, Dept. of Physical Medicine and Rehabilitation, [2]County Clinical Emergency Hospital of Sibiu, Dept. of Endocrinology, [3]Lucian Blaga Univ. of Sibiu, Dept. of Endocrinology, Sibiu, Romania

Objective: To assess the management of severe secondary osteoporosis in systemic lupus erythematosus patients on chronic glucocorticoid therapy. This is a case report. A complete bone status assessment was performed.
Case report: A 56-year-old female on methylprednisolone since 2005 for lupus with Sjögren's syndrome and primary biliary cirrhosis overlap, presented in 2018 with a left femoral neck fracture and vertebral compression fractures (T8, T10, T12, L1). DXA revealed lumbar T-score -2.4, BMD = 0.892, Z-score = -1.6; left femoral neck T-score -3.3, BMD = 0.640, Z-score = -2. Bone marker tests revealed osteocalcin at 5.6 ng/mL and beta CrossLaps at 0.19 ng/ml. The patient received oral risedronic acid(2018–2021), but the treatment was discontinued due to a superior digestive hemorrhage. Teriparatide was then administered for 15 months and discontinued voluntarily due to thoracic pain and muscle cramps. Denosumab was initiated in 2023, resulting in a favorable clinical response-no new fractures, and increased DXA-measured body mass density.
Conclusion: Management of severe secondary osteoporosis in the context of autoimmune disorders and chronic glucocorticoid therapy is complex. Early initiation of bone protective therapy is important, especially in individuals at heightened fracture risk. The introduction of denosumab in 2023 aligns with current guidelines, considering both efficacy and tolerability.
References: 1. Popa FL, Iliescu MG, Stanciu M, Georgeanu V. Rehabilitation in a case of severe osteoporosis with prevalent fractures in a patient known with multiple sclerosis and prolonged glucocorticoid therapy. Balneo and PRM Research Journal 2021;451:12(3):248–288. https://doi.org/10.12680/balneo.2021.451 2. Popa FL, Diaconu C, Canciu A et al. Medical management and rehabilitation in posttraumatic common peroneal nerve palsy. Balneo and PRM Research Journal;2022,13(1):496.DOI10.12680/ balneo. 2022.496 3. Marginean CM, Cioboata R, Olteanu M et al. The Importance of Accurate Early Diagnosis and Eradication in Heli cobacter pyloriInfection: Pictorial Summary Review in Children and Adults. Antibiotics 2023,12,60.https://doi.org/10.3390/antibiotics12010060 4. Stanciu M, Zaharie IS, Bera LG, Cioca G. Correlations between the presence of Hurthle cells and cytomorpho logical features of fine-needle aspiration biopsy in thyroid nodules. Acta Endo.2016;12(4),485–490.https://doi.org/10.4183/aeb.2016.485 5. Carsote M, Stanciu M, Popa FL et al. Domestic fall–related mul tiple osteoporotic vertebral fractures: considerations amid late COVID-19 pandemic (a case on point). Balneo and PRM Research Journal.2023,14(4):637. https://doi.org/10.12680/balneo.2023.637.

P923
EFFICACY OF TERIPARATIDE THERAPY IN OSTEOPOROTIC VERTEBRAL FRACTURES

R. P. Ristea[1], F. L. Popa[2], M. Stanciu[3]

[1]County Clinical Emergency Hospital of Sibiu, Dept. of Endocrinology, [2]Lucian Blaga Univ. of Sibiu, Dept. of Physical Medicine and Rehabilitation, [3]Lucian Blaga Univ. of Sibiu, Dept. of Endocrinology, Sibiu, Romania

Objective: To assess the occurrence of vertebral fractures in teriparatide-treated women with postmenopausal osteoporosis.
Methods: This retrospective study included 48 female patients (mean age ≈72.32) with postmenopausal osteoporosis, who had prior bisphosphonate treatment. Inclusion criteria: age, back pain intensity, and a minimum of 24 months of teriparatide treatment. BMD was measured annually using DXA via a Hologic instrument. Vertebral compression fractures were evaluated in all patients.
Results: Among the 48 patients, 28 (58.3%) experienced multiple vertebral compression fractures, while 7 (14.6%) had a single vertebral compression fracture. The remaining 13 participants (27.1%) showed no vertebral fractures. T12 was the most affected vertebra. Six patients (12.5%) underwent vertebroplasty for fracture management. Distal radial epiphysis fractures occurred in 9 participants (18.8%), and 3 (6.3%) experienced hip fractures. Pain complaints varied, with lumbar and dorsal back pain being the most common (56.2%), along with hip pain. No new fractures were reported during teriparatide treatment, and pain intensity significantly improved.
Conclusion: Osteoporosis and associated pain contribute to emotional and social challenges. A 24-month teriparatide treatment in patients with severe osteoporosis demonstrated protective potential against new fractures, increased BMD, and provided substantial pain relief.
References: 1. Carsote M, Stanciu M, Popa FL et al. Domestic fall–related multiple osteoporotic vertebral fractures: considerations amid late COVID-19 pandemic (a case on point).Balneo and PRM Research Journal.2023,14(4):637.https://doi.org/10.12680/balneo.2023.637 2. Popa FL, Diaconu C, Canciu A, et al. Medical manage ment and rehabilitation in posttraumatic common peroneal nerve palsy. Balneo and PRM Research Journal;2022,13(1):496.DOI10.12680/ balneo.2022.496 3. Marginean CM, Cioboata R, Olteanu M et al. The Importance of Accurate Early Diagnosis and Eradication in Helicobacter pyloriInfection: Pictorial Summary Review in Children and Adults. Antibiotics.2023,12,60.https://doi.org/10.3390/antibiotics12010060 4. Stanciu M, Zaharie IS, Bera LG, Cioca G. Correlations between the presence of Hurthle cells and cytomorpho logical features of fine-needle aspiration biopsy in thyroid nodules. Acta Endo.2016;12(4),485–490.https://doi.org/10.4183/aeb.2016.485 5. Popa FL, Iliescu MG, Stanciu M, Georgeanu V. Rehabilitation in a case of severe osteoporosis with prevalent fractures in a patient known with multiple sclerosis and prolonged glucocorticoid therapy. Balneo and PRM Research Journal.2021;451:12 (3):248–288. https://doi.org/10.12680/balneo.2021.451

P924
MANAGEMENT OF POSTMENOPAUSAL OSTEOPOROSIS ASSOCIATED WITH PARKINSON'S DISEASE AND CHRONIC AUTOIMMUNE THYROIDITIS

R. Pipernea[1], G. Ielciu[1], R. P. Ristea[2], F. L. Popa[3], A. Brescan[4], S. Brescan[4], M. Stanciu[5]

[1]Emergency Clinical County Hospital of Sibiu, Dept. of Rehabilitation, Sibiu, Romania, [2]County Clinical Emergency Hospital of Sibiu, Dept. of Endocrinology, Sibiu, Romania, [3]Lucian Blaga Univ. of Sibiu, Dept. of Physical Medicine and Rehabilitation, Sibiu, Romania, [4]Anregiomed Klinikum Ansbach, Ansbach, Germany, [5]Lucian Blaga Univ. of Sibiu, Dept. of Endocrinology, Sibiu, Romania

Objective: To evaluate and manage postmenopausal osteoporosis associated with Parkinson's disease and chronic autoimmune thyroiditis, disorders that may increase fracture risk.
Case report: We present the case of a 62-year-old patient diagnosed with severe osteoporosis at 43 after early menopause, who underwent bisphosphonate treatment for 20 y, and currently receiving teriparatide. Diagnosed 6 years ago with Parkinson's disease, neurological treatment was initiated. The patient is known with a non-toxic multinodular goiter with euthyroidism, and chronic autoimmune thyroiditis which is considered a contributing factor to osteoporosis. Over the last 18 months, the patient suffered multiple falls, leading to various fractures, including a neglected L3 vertebral fracture requiring L2-L4 rachisynthesis for spine stabilization, a right forearm, and radiocarpal region fractures, treated with osteosynthesis. A few months before admission to our rehabilitation clinic, surgery was performed for an open right forearm fracture. During hospitalization, the patient received anti-Parkinson's drugs, teriparatide, cholecalciferol, and calcium. Following an individualized rehabilitation program, the evolution was slightly favorable with functional improvement and partial walking rehabilitation achieved.
Conclusion: Degenerative neurological conditions and autoimmune thyroid disease are important factors that contribute to postmenopausal osteoporosis. A correct interdisciplinary management of these conditions can favorably influence the evolution in these cases. References 1. Popa FL,Iliescu MG,Stanciu M,Georgeanu V.Rehabilitation in a case of severe osteoporosis with prevalent fractures in a patient known with multiple sclerosis and prolonged glucocorticoid therapy.Balneo and PRM Research Journal.2021;451:12 (3):248–288. DOI12680/balneo.2021.451. 2. Popa FL,Diaconu C,Canciu A et al.Medical management and rehabilitation in posttraumatic common peroneal nerve palsy. Balneo and PRM Research Journal;2022, 13(1):496.DOI12680/ balneo.2022.496. 3. Marginean CM,Cioboata R,Olteanu M et al.The Importance of Accurate Early Diagnosis and Eradication in Helicobacter pyloriInfection: Pictorial Summary Review in Children and Adults.Antibiotics.2023,12,60.DOI3390/antibiotics12010060. 4. Stanciu M, Zaharie IS,Bera LG,Cioca G.Correlations between the presence of Hurthle cells and cytomorphological features of fine-needle aspiration biopsy in thyroid nodules.Acta Endo.2016;12(4),485–490.DOI4183/aeb.2016.485. 5. Carsote M, Stanciu M,Popa FL et al.Domestic fall–related multiple osteoporotic vertebral fractures: considerations amid late COVID-19 pandemic(a case on point).Balneo and PRM Research Journal.2023,14(4):637.https://doi.org/10.12680/balneo.2023.637 6. A Streza,A Antoniac,V Manescu Paltanea et al.Effect of Filler 563POSTERS ABSTRACTS Types on Cellulose-Acetate-Based Composite Used as Coatings for Biodegradable Magnesium Implants for Trauma.Materials,2023 Jan 6;16(2):554.https://doi.org/10.3390/ma16020554.

P925
USING DATA TO INFORM THERAPY: REAL-WORLD UTILIZATION PATTERN OF ROMOSOZUMAB AMONG POSTMENOPAUSAL WOMEN

M. Toth[1], M. Elgaafary[2], Y. El Miedany[3]

[1]King's college London, London, UK, [2]Ain Shams Univ., Cairo, Egypt, [3]Canterbury Christ Church Univ., Canterbury, UK

Objective: Romosozumab is a NICE-approved humanized monoclonal antibody sclerostin inhibitor used to treat osteoporosis in postmenopausal women at high risk of fracture, including patients with a history of osteoporotic fracture, multiple risk factors, or that have failed or are intolerant to other available osteoporosis. Aims:
1. To assess the possibility of involving the patients in the decision making of prescribing romosozumab
2. To evaluate the safety of romosozumab in treating postmenopausal women with osteoporosis
3. To assess adherence to romosozumab therapy during consequent follow ups
Methods: This was an audit which included women who met the NICE guidelines and West Kent and Medway Osteoporosis Group recommendations for romosozumab therapy. All the patients who newly started romosozumab therapy in Kent, England were identified as candidates for inclusion in this work. Validated management algorithm started with a pre-Romosozumab therapy screen. This was carried out using a self-reported patient questionnaire to check for any possible contraindication to romosozumab therapy. Patients with Paget's disease, metastatic cancer or the diagnosis of cancer at the same time of considering the therapy were excluded from the work. All the patients who completed at least 6 months of romosozumab therapy were included in this work. Patient education: All the patients received patients' friendly information leaflets that gives full details of the pros and possible side effects of romosozumab therapy. Training on how to administer the injections was carried out using a demo. Study outcomes: I. adherence to romosozumab therapy, defined as the proportion of the days covered [PDC]; using the equation: PDC (%) = number of days covered by medication/ number of days in period $\times$ 100; II. 12-months interruption rate defined as the proportion of the patients who did not have their medication renewed within 30 days after exhaustion of the previous dispensed romosozumab injections.
Results: 22-patients were identified to meet the national and regional criteria for romosozumab therapy. Mean age was 80.54 $\pm$ 4.18. All the patients received previous osteoporosis therapy. All the patients had past history of fragility fractures. Mean 10-y probability of major osteoporosis fracture was 31.08 $\pm$ 13.47 whereas for hip fractures it was 16.82 $\pm$ 15.25. Using the pre-therapy screening questionnaire, 6 patients had past history of cardiovascular incidents, whereas 1 patient refused to start the treatment as she was concerned about the side effects. Another patient stopped the romosozumab therapy 1 month after starting the treatment because of her concern about the medication safety as she has positive family history of cardiac problems. 14 patients completed 10 months or more of romosozumab therapy. High adherence was reported among romosozumab users (mean PDC was 93.3%) at both 6 months and 12 months. Interruption rate was 6.7% among romosozumab cohort at both 6 months and none at 12 months. None of the patients sustained a new fragility fracture during the monitoring period. None of the patients sustained any major adverse cardiovascular event.
Conclusion: High adherence and few interruptions among romosozumab therapy patients was noted in this work. The high scores of baseline hip fracture probability show the gap in osteoporosis care which needed to be filled in the management of patients at high risk of sustaining hip fractures. The pre-therapy screening questionnaire was helpful to identify the patients who had contraindications to

romosozumab therapy. Patient education and involving the patients in the decision making has helped to ensure better adherence to therapy.

P926
CREATING AND PILOTING AN ONLINE OSTEOPOROSIS COURSE THROUGH A MULTIDISCIPLINARY MULTI-INSTITUTE APPROACH: A CROSS-SECTIONAL QUALITATIVE STUDY

L. Jafri[1], M. U. N. Effendi[1], H. Majid[1], A. H. Khan[1], S. Ahmed[1], M. Zaman[2], Q. Riaz[3], S. Fatima[4], A. Ejaz[5], F. Aslam[6]

[1]Dept. of Pathology and Laboratory Medicine, The Aga Khan Univ., Karachi, [2]Dept. of Radiology, The Aga Khan Univ., Karachi, [3]Dept. of Education, The Aga Khan Univ., Karachi, [4]Dept. of Biological and Biomedical Sciences, The Aga Khan Univ., Karachi, [5]Mohi Uddin Islamic Medical College, Mirpur Azad Jammu and Kashmir, [6]Quaid e Azam Medical College, Bahawalpur, Pakistan

Objective: Postgraduate trainees (PGs) trained via a multidisciplinary model receive collaborative learning opportunities from a wide range of experts. There is a dearth of such approaches in the current post-graduate medical education (PGME) curriculum in Pakistan. Taking the example of osteoporosis, a multidisciplinary online course on osteoporosis was designed to gauge the impact of a novel educational tool on the teaching and learning capabilities of PGs and course facilitators.
Methods: A multi-institute multidisciplinary team was formulated to deliver a course on osteoporosis on a virtual learning environment (VLE) platform. PGs (n = 9) from various disciplines and institutes were nominated by their respective faculty and enrolled after obtaining informed consent. The modular component consisted of recorded micro-lectures, flashcards, videos, case challenges, and mini-interviews with the experts. Educational impact was measured by pre-, and post-module tests and perception of the process was taken on a Likert scale of 1–5.
Results: A pre-test was attempted by 66% (n = 6) of PGs with a mean score of 43.8%. After taking the VLE module, all PGs (n = 9) cleared the end of the module test with an average score of 96%. All the PGs (n = 9) believed that VLE was a great platform for online courses and were satisfied with this teaching strategy. They (n = 8), 88.9%, stated that they could easily navigate the course and were comfortable using VLE. The majority (n = 8), 88.9%, agreed that course learning was implementable in clinical practice, whereas 66.7% (n = 6) were extremely satisfied with learning objectives and the content uploaded. The process also led to the capacity building of facilitators to become acquainted with VLE.
Conclusion: An institute with adequate facilities for faculty training can develop online multidisciplinary modules to benefit institutes in resource-limited settings.

P927
UNRAVELING THE GENETIC LANDSCAPE OF HYPOPHOSPHATEMIA: A RARE CASE ANALYSIS REVEALING A NOVEL DMP1 MUTATION

A. H. Khan[1], M. U. N. Effendi[1], H. Majid[1], M. Bilal[1], S. Kirmani[2]

[1]Dept. of Pathology and Laboratory Medicine, The Aga Khan Univ., [2]Dept. of Paediatrics and Child Health, The Aga Khan Univ., Karachi, Pakistan

Autosomal recessive hypophosphatemia arises from homozygous inactivating mutations in dentin matrix protein 1 (DMP1), a gene responsible for encoding a noncollagenous bone matrix protein expressed in osteoblasts and osteocytes**.** The objective of this case report is to present and analyze a rare case of hypophosphatemia, highlighting its clinical manifestations and diagnostic approach to contribute valuable insights to the medical community. This case report outlines the evaluation of a patient in a Metabolic Bone Disease Clinic at The Aga Khan University Hospital, Karachi, Pakistan. Through detailed patient history, laboratory investigations, and imaging studies, we characterized the etiology and clinical course of a rare case of hypophosphatemia. Ethical considerations were adhered to, with informed consent obtained for both clinical assessment and genetic testing.
Case report: A 46-year-old lady, having been diagnosed and managed as a case of vitamin D-dependent rickets during childhood developed stiffness and limited range of motion at various joints with increasing age. Biochemistries were consistent with hypophosphatemia owing to renal phosphate wasting with the ratio of the renal tubular maximum reabsorption rate of phosphate to glomerular filtration rate (TmP/GFR) being 1.8 mg/dl and fractional excretion of phosphate ($FePO_4$) 16.2%. Radiographs showed generalized diffuse osteosclerosis, diffuse hyperostosis frontalis in the skull, ossification of the sacrospinous and paravertebral ligaments, and some enthesopathy along the proximal aspect of bilateral tibia and fibula. A comprehensive skeletal disorder panel consisting of 358 genes was employed to investigate the genetic basis of the patient's condition and it revealed a novel homozygous splice site mutation in Intron 5 (c.184-7A > G) of the DMP1 gene.
Conclusion: The findings provide crucial insights into the molecular basis of hypophosphatemia-related skeletal complications in this patient.

P928
SELECTIVE EMBOLIZATION OF GENICULAR ARTERIES MAY BE A SOLUTION TO TREAT SYNOVITIS, STIFFNESS, AND PAIN AFTER TOTAL KNEE ARTHROPLASTY

M. U. Rezende[1], L. G. M. Valle[2], A. M. André[3], G. P. Ocampos[1], F. L. Galastri[2], B. B. Affonso[2], F. C. Carnevalle[4], F. Nasser[2]

[1]Departamento de Ortopedia e Traumatologia do Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, [2]Hospital Israelita Albert Einstein, [3]Insituto de Radiologia do Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, [4]Instituto de Radiologia do Hospital das Vlínicas da Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil

Objective: To document the effects of embolization of branches of genicular arteries in patients with pain and synovitis after total knee arthroplasty due to osteoarthritis (OA).
Methods: Prospective case series of 8 patients (9 knees) with persistent pain, effusion, stiffness, and synovitis after knee arthroplasty submitted to transcatheter arterial embolization since August 2021. Clinical outcomes were evaluated at baseline, one and two years with EQ5D, WOMAC (0–96) and KOOS. All patients had their knees aspirated at the operating room to ascertain lack of infection.
Results: Abnormal neovessels were identified in all cases. One patient remained with cutaneous color changes even after 2 years of the procedure in both knees. No tissue necrosis, dermal ulcers, or peripheral ulcers. Three patients required to do the procedure more than once (twice in two and thrice in one). EQ5D improved from an average of 0.9063 ± 0.05 to $0{,}9562 \pm 0.04$ (one year), and 0.9828 ± 0.02 at 2 years. WOMAC pain improved from 1.83 ± 2 to 1.33 ± 1(one year) and 0 at 2 years (only three patients, i.e., four knees performed the procedure only once and reached de 2-year follow-up mark). Stiffness improved from 1 ± 1.5 to 0.5 ± 1.2(one year) and 0 (2-year). Baseline WOMAC function was 9.5 ± 6.2 improving to 3.1 ± 2.3 (one year) and 1.75 ± 0.96 at two years.

WOMAC total (0–96) WOMAC total reduced from average of 12.3 to ± 7.4 to 4.7 ± 2.9(one year) and 1.75 ± 0.96 (two years). KOOS pain improved from 85 ± 14.2 to 89.5 ± 6.6(one year) and 94.5 ± 3.8 at 2 years. KOOS activities of daily living improved from 72.3 ± 35.2 to 94.3 ± 3.2(one year), and 95.2 ± 1.5(2-year). KOOS sports improved from 39.2 ± 27.3 to 55.8 ± 30(one year) and 79.5 ± 27.8. KOOS quality of life improved from 59.3 ± 12.4 to 72.2 ± 14.8 at one year and to 73.75 ± 16.7 (2-year). KOOS general improved from 75.8 ± 11.3 to 84 ± 4.3 at one year and to 88 ± 3.4 at two years. All patients improved in all parameters continuously.
Conclusion: Embolization of branches of genicular arteries in patients with persistent pain, stiffness, effusion, and synovitis, after total knee arthroplasty, due to OA, may provide long lasting improvements in pain, function, and quality of life.

P929
TWO-YEAR RESULTS OF EMBOLIZATION OF PATHOLOGICAL BRANCHES OF GENICULAR ARTERIES IN KNEE OA WITH SYNOVITIS AND STIFFNESS

M. U. Rezende[1], L. G. M. Valle[2], A. M. Assis[3], F. L. Galastri[2], G. P. Ocampos[1], B. B. Affonso[2], F. C. Carnevalle[4], F. Nasser[2]

[1]Departamento de Ortopedia e Traumatologia do Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, [2]Hospital Israelita Albert Einstein, [3]Insituto de Radiologia do Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, [4]Instituto de Radiologia do Hospital das Vlínicas da Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil

Objective: To document the effects of embolization of branches of genicular arteries in patients with knee osteoarthritis (OA) with pain, stiffness, and synovitis.
Methods: Prospective case series included 27 patients (29 knees) with OA Kellgren-Lawrence (KL) grades 2–4 and synovitis with persistent moderate to severe pain resistant to conservative management submitted to transcatheter arterial embolization since August 2021. Clinical outcomes were evaluated at baseline, one and two years with EQ5D, WOMAC and KOOS.
Results: Abnormal neovessels were identified in all cases. Four patients (all women) remained with cutaneous color changes even after two years (of these, three had skin necrosis that either healed spontaneously (two), or that necessitated debridement (one). Five patients (all Ahlback 5) had their total knee replacement between six months and two years due to increased pain e decreased function. Of the remaining patients EQ5D improved from an average of 0.7798(± 0.18) to 0.8914(± 0.1) at 1 year and 0.9118(± 0,18). WOMAC total (0–96) improved from 29.2 (± 17) to 12.9(± 10.7) and 11 at two years. WOMAC stiffness improved in all patients from an average of 2.35 ± 2 to 0.6 ± 1(one year) and 0.4 ± 1.2 at two years. KOOS pain improved from 59.4 ± 18.7 to 80.8 ± 13.3 at one year and 85 ± 23 at two years. KOOS activities of daily living improved from 68 ± 22.1 to 82.8 ± 20.9 (one year) and 81.7 ± 33.3 at two years. KOOS sports improved from 28.8 ± 23.5 to 53.2 ± 28.4 (one year) and 65.5 ± 34.7 at two years. KOOS Quality of life improved from 37.8 ± 14.8 to 56.2 ± 16.6(one year) and 67.5 (two years). KOOS general improved from 52.2 ± 15.7 to 78.2 ± 16.3 (one year) and 82.3 at two years. Patients with grade IV K&L OA and Ahlback V with painful periarticular cysts did not improve with the technique. Pain and function results for grade V (Ahlback) declined after 6 months to one year leading to total knee arthroplasty. Pain, stiffness, function, and quality of life remained steady in patients with K&L grades 2 and 3 up to two years.
Conclusion: Selective embolization of pathological branches of genicular arteries can provide long lasting improvements in pain, function, and quality of life of patients with K&L grades 2 and 3.

P930
LOW VITAMIN D LEVELS IN PATIENTS WITH RHEUMATOID ARTHRITIS HAVE AN IMPACT ON THE EFFECTIVENESS OF REHABILITATION INTERVENTIONS

M. V. Nikitin[1], N. V. Aleksandrova[2], V. A. Aleksandrov[3], R. A. Grekhov[3], A. V. Aleksandrov[3]

[1]"Sanatorium-resort complex "Vulan"—Branch Federal State Budget Institution "National Medical Research Center for Rehabilitation and Balneology" of the Ministry of Health of the Russian Federation, Gelendjik, [2]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, [3]Volgograd State Medical Univ., Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, Russia

Objective: Vitamin D deficiency may be associated with the development of autoimmune diseases such as rheumatoid arthritis (RA). The immunoregulatory role of vitamin D in the prevention and treatment of RA is discussed nowadays. We aimed to evaluate the effect of vitamin D deficiency on the effectiveness of posthospital rehabilitation of patients with RA.
Methods: We examined 48 women (mean age 52.2 ± 11.4 years old, disease duration 8.3[3.8;14.5] y) with a reliable diagnosis of RA who underwent posthospital rehabilitation (sanatorium treatment for 21 d). Disease activity was evaluated by DAS28, pain intensity (when walking) by visual analog scale (VAS Huskisson), fatigue severity by BRAF-NRSv2 scale. The level of serum 25(OH)D was determined by enzyme immunoassay (test system "25-OH-Vitamin D Total", DRG, Germany).
Results: Vitamin D deficiency (< 10 ng/mL) was determined in 12.5%, insufficient levels (values in the range of 10–29 ng/mL) were determined in 79.2%, and sufficient levels (values in the range of 30–100 ng/mL) were determined in 8.3% of RA patients. Lower vitamin D content ($p = 0.033$) was observed in patients who came for treatment from regions with low solar insolation (group I, n = 22). In addition, patients from group I had higher DAS28 disease activity ($p < 0.001$) and VAS score ($p = 0.012$) than RA patients from regions with high levels of solar insolation (group II, n = 26). No intergroup differences in fatigue scores on the BRAF-NRSv2 scale were found ($p > 0.05$). The 3-week stay and treatment in the sanatorium (high level of solar insolation) demonstrated reduction of pain intensity according to VAS ($p = 0,017$) and fatigue according to BRAF-NRS questionnaire scales: severity ($p = 0,041$) and NRS-effect ($p = 0,029$) only in patients from group II. No significant changes in these indices were found in group I. Disease activity according to DAS28 also did not change neither in group I, nor in group II ($p > 0,05$) during the treatment.
Conclusion: Vitamin D deficiency in patients with RA is associated with the level of insolation in the region of residence, depends on disease activity and is associated with increased VAS and fatigue. The proven potential of vitamin D to regulate the immune response can be used at the stage of medical rehabilitation of patients with RA to control the disease and its manifestations.

P931
DO WE PAY ENOUGH ATTENTION TO SKELETAL HEALTH IN PATIENTS TREATED WITH CINACALCET FOR PRIMARY HYPERPARATHYROIDISM?

M. Ventosa[1], M. A. Martín-Almendra[2], J. M. Palacio[3], C. Crespo[3], F. García-Urruzola[3], L. Cuéllar[3], M. T. Mories[4], M. González-Sagrado[5], D. Peñalver[3], M. Peralta[3], A. González-González[3], A. Manso[3], F. Núñez[1]

[1]Dept. of Endocrinology. Hospital Universitario Río Hortega., Valladolid, [2]Dept. of Endocrinology. Hospital Universitario de Salamanca, Salamanca, [3]Dept. of Endocrinology. Hospital Universitario Río Hortega, Valladolid, [4]Dept. of Endocrinology. Hospital Universitario Salamanca, Salamanca, [5]Dept.of Medical Investigation. Hospital Universitario Río Hortega, Valladolid, Spain

Objective: To investigate fracture (Fx) incidence, BMD monitoring and osteoporosis (OP) management in patients on cinacalcet therapy with primary hyperparathyroidism (PHP).
Methods: Retrospective observational study of 126 patients with PHP treated with cinacalcet in 2023, from 2 hospitals in Castilla y León. Clinical, laboratory and densitometric data were analyzed from the beginning of treatment until 5 y later.
Results: 16/110 male/female were included. Age 74.1 ± 12 y (16–93); total calcium 11.4 ± 0.6 mg/dl. 78.6% had a DXA before cinacalcet. Lumbar spine T-score -2.13 ± 1.3, femoral neck T-score -2.01 ± 0.9. OP in 47.9% (spine 40.4%, femoral neck 32%) and 40.7% at 5 y. DXA available at 1 y in 35.1%; 43.4% at 3 y and 50.9% at 5 y. 17.5% experienced at least 1 previous clinical Fx. 4.3% had a new Fx in the 1st year; 9.3% in 3 y; 15% in 5 y. Previous Fx were more prevalent if lumbar OP was present: 32.5 vs. 10.2% ($p < 0.01$). Patients with previous Fx experienced a new Fx more frequently than non-fractured: 47.1 vs. 6.1% ($p < 0.001$). In a logistic regression model, after adjustment for age > 80 y and vit D < 10 ng/ml, the risk of new Fx was associated with sex(male) (OR 22.1; p 0.03) previous Fx (OR 22.1; p 0.01) and femoral OP (OR 12.8; p 0,03). Total calcium was 9.8 ± 0.6 mg/dl at 5 y ($p < 0,001$). 58.3% achieved vit D levels > 30 ng/ml after 5 y (88.9% under vit D supplementation). Initially 23.8% were on bisphosphonate treatment, 4% on denosumab and 0.8% on strontium ranelate. During follow-up 29.4% on bisphosphonates, 6.3% on denosumab and 0.8% on raloxifene.42.9% of the patients who experienced a new Fx were treated with bisphosphonates, 7.1% with denosumab.
Conclusion: PHP patients had a high incidence of clinical fractures before and through 5 y of treatment with cinacalcet. Conservative treatment with cinacalcet and vit D was effective to improve calcium and vit D levels. BMD monitoring and OP treatment are mandatory in this population.

P932
INCREASING THE DIFFERENTIATION POTENTIAL OF ADIPOSE DERIVED STEM CELL INTO OSTEOCYTE AND CHONDROCYTE BY PLANT DERIVED EXOSOMES: A POSSIBLE THERAPEUTIC STRATEGY FOR CARTILAGE DEFECTS

M. Y. C. Yıldırım Canpolat[1], N. Ünsal[1], B. K. Kabataş[1], O. E. Eren[1], F. Şahin[1]

[1]Yeditepe Univ., Biotechnology, İstanbul, Turkey

The treatment of articular cartilage defects is a particularly pressing issue, in large part because the available therapeutic alternatives are insufficiently effective. Even very slight injury may continue and cause joint deterioration, which can eventually lead to osteoarthritis due to the avascular cartilage's limited potential for self-repair. Cell- and exosome-based therapies show promise as potential treatments for repairing injured cartilage, despite the fact that a variety of therapy approaches have been explored. Plant extracts have been used for many decades, and research into the impact that these extracts have on the regeneration of cartilage has been conducted. Exosome-like vesicles, which are released by all live cells, have a role in both the communication between cells and the maintenance of the homeostasis of individual cells. In this study, human adipose-derived mesenchymal stem cells (hASCs) were differentiated into chondrocytes to explore the differentiation potential of exosome-like vesicles obtained from *R. raphanistrum*, *S. lycopersicum* and *C. limon*, which are known to have anti-inflammatory and antioxidant activities. An aqueous two-phase system was carried out in order to create radished-derived exosome like vesicles (RELVs), tomato-derived exosome-like vesicles (TELVs) and lemon-derived exosome-like vesicles (LELVs). Using methods such as the Zetasizer, NTA FAME analysis, and scanning electron microscopy, we were able to characterize the separated vesicles according to their size and form. According to these findings, RELVs, TELVs and LELVs both boosted the vitality of the cells and did not have any harmful effects on the stem cells tested. While RELVs and TELVs promoted chondrocyte development, LELVs had the opposite effect and inhibited it. Following treatment with RELV, there was an uptick in the level of expression of chondrocyte markers such as ACAN, SOX9, and COMP. Additionally, protein expression of the two most significant proteins present in cartilage's extracellular matrix, COL2 and COLXI, increased. Both of these proteins are located in cartilage. These results point to the possibility that RELVs may be used for cartilage regeneration, which would make them an innovative and potentially fruitful therapy for osteoarthritis.

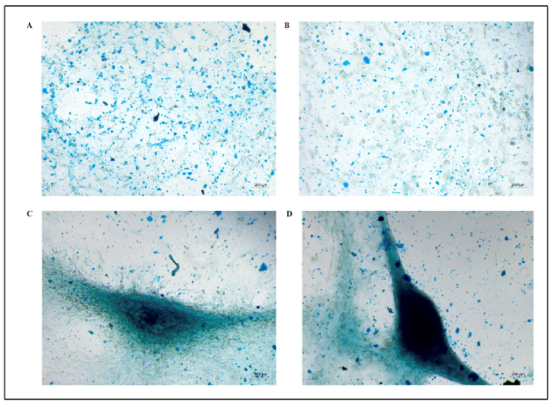
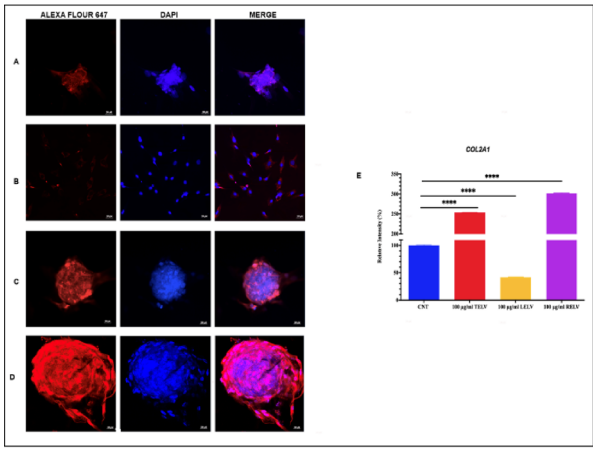
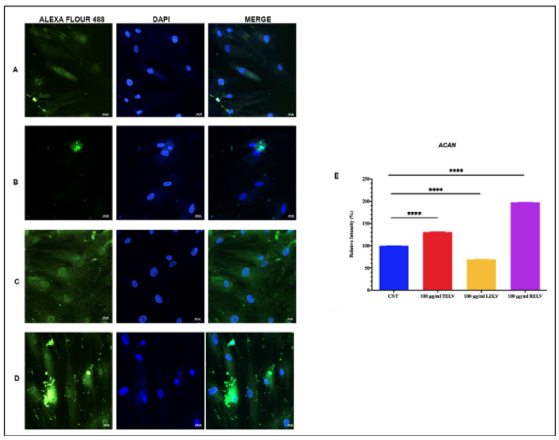


Figure 4. 6. Alcian Blue staining images at 10X magnification of chondrogenic differentiations with (A) untreated cells, (B)treatment of LEVL, (C)treatment of TEVL, (D)treatment of REVL after 21 days.





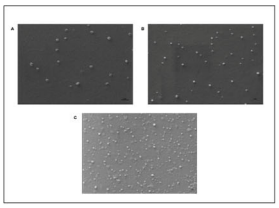


Figure 4. 2. Morphology and sizes of (a) TELV, (b) LEVL, (c) RELV are indicated via Scanning Electron Microscope (SEM) with a scale bar of 1 µm.

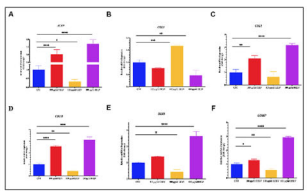


Figure 4. 7. mRNA expression levels of differentiated cells for (A) ACAN, (B) COL1, (C) COL2, (D) COLXI, (E) SOX9, and (F) COMP genes upon control; 100 µg/mL of TELV,LELV and RELV treatments

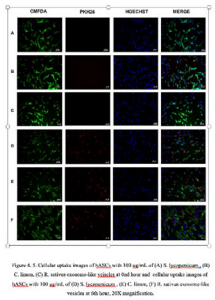


Figure 4. 5. Cellular uptake images of hASCs with 100 µg/mL of (A) S. lycopersicum, (B) C. lanceolata, (C) R. sativus exosome-like vesicles at final dose and cellular uptake images of hASCs with 100 µg/mL of (D) S. lycopersicum, (E) C. lanceolata, (F) R. sativus exosome-like vesicles at 6th hour, 20X magnification.

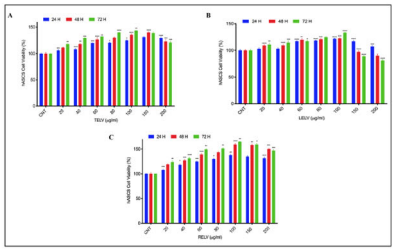


Figure 4. 4. Effects of different doses between 20-200 µg/ml of (A) TELV (B) LELV (C) REVL on hASC proliferation after 24 h, 48 h, and 72 h incubation.

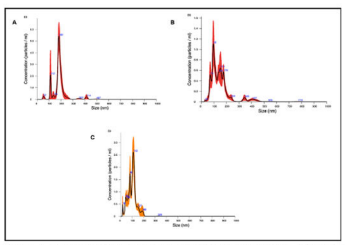


Figure 4. 1. Size and concentration graphic data of (A) TELV, (B) LEVL, (C) REVL are demonstrated via Nanoparticle Tracking Assay (NTA)

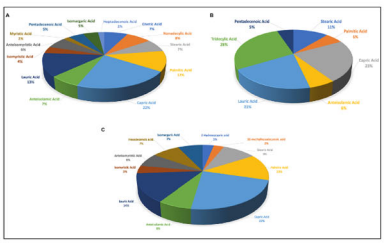


Figure 4. 3. Fatty Acid Methyl Ester analysis for lipid contents of (A) TELV, (B) LEVL and (C) REVL with percentages of leading lipid contents

P933

BIOINFORMATIC ANALYSES TO IDENTIFY OSTEOGENIC ROBUSTNESS IN TISSUE-SPECIFIC HUMAN MESENCHYMAL STEM CELLS (MSCS) AND 3D IN VITRO PLATFORMS FOR RAPID FUNCTIONAL VALIDATION

M. Yen[1], L. Wang[1], J. Hung[1], H. Wang[2], B. Yen[2]

[1]National Taiwan Univ., College of Medicine, Dept. of Ob/Gyn, Taipei, [2]Institute of Cellular & System Medicine, National Health Research Institutes, Zhunan, Taiwan

Objective: Progress in precision medicine has dramatically improved outcomes for oncology and related cell therapies, but allogeneic mesenchymal stem cell (MSC) therapy, which holds the most promise for regeneration of bone, is complex with its many available tissue sources, lags in establishing molecular and high-resolution criteria to predict and improve therapeutic outcomes. In addition, while in vivo validation is the gold standard for osteogenesis, the long time period required (4–8 weeks) and the need for immunocompromised mice when testing human cellular products make use of this assay difficult and costly for clinical application.

Methods: We assess the use of whole transcriptomic information followed by rapid functional validation in a 3D in vitro platform to identify robust osteogenic capacity between commonly used sources of human MSCs.
Results: Transcriptomic analysis revealed similar enrichment for osteogenic-related pathways adult bone marrow (BM) MSCs compared to fetal placental MSCs (PMSCs). Interestingly, mitochondrial-related pathways were significantly more enriched in PMSCs than BMMSCs. Functional assessment of mitochondrial membrane potential and respiration validated the transcriptomic findings. Functional osteogenic differentiation in 3D in vitro culture demonstrated more robust osteogenesis with PMSCs compared to BMMSCs. Moreover, 3D culture further enhanced the mitochondrial functions of PMSCs in a significant fashion, which was not consistently seen with BMMSCs. Inhibiting mitochondrial function in 3D-cultured PMSCs resulted in a significant decrease in osteogenesis at both transcriptomic and functional levels, demonstrating the importance of mitochondrial health in MSC osteogenesis.
Conclusion: Bioinformatics analyses of whole transcriptomes is therapeutically useful for identification of functional osteogenic capacity between difference sources of human MSCs. Moreover, the state of mitochondrial health is strongly aligned with MSC osteogenic capacity and can be modulated by 2D vs. 3D in vitro culture. Our data implicates additional therapeutically relevant strategies to improve regeneration of bone, an organ which undergo age-related as well as pathologic decline, through modulating mitochondrial health and 3D in vitro culture systems.
Acknowledgement: This work was partially funded by the National Science & Technology Council of Taiwan (MOST-111–2314-B-002–159-MY3 to M.L.Yen).

P934
ZINC: AN ANONYMOUS FOE OR AN EVIDENT COMRADE FOR OSTEOARTHRITIS? A COMPREHENSIVE LITERATURE REVIEW

I. Tekeoğlu[1], M. Z. Şahin[2]

[1]Sakarya Univ. Faculty of Medicine, Dept. of Rheumatology,,
[2]Sakarya Univ. Faculty of Medicine, Dept. of Physical Medicine and Rehabilitation, Sakarya Univ. Training and Research Hospital, Sakarya, Turkey

Objective: Osteoarthritis (OA) is a chronic debilitating disease that mainly affects the articular cartilage throughout the human body. Higher prevalence is seen in the elderly population and the risk increases with comorbid diseases or obesity. Owing to zinc being the second most abundant trace element found in the body after iron, it holds great significance for the human body. It exerts substantial influence in intracellular signaling pathways on account of it being a cofactor for more than 300 enzymes and 3000 metalloproteins. Thus, it is not a surprise that modern studies show plenty of pathological pathways incorporating zinc in osteoarthritis (OA) pathogenesis. Numerous recent studies indicate that zinc has a preventative effect against Monosodium Iodoacetate (MIA)-stimulated osteoarthritic cartilage. Intraarticular MIA injection is used worldwide to induce joint pathology mimicking OA. However, the clear effect of zinc on human OA remains undisclosed. We aimed to elucidate the impact of zinc on bone health and osteoarthritic cartilage and determine the concentrations associated with these effects.
Methods: We thoroughly searched PubMed, Wiley, and Cochrane Library databases using the keywords 'Osteoarthritis', 'Zinc', 'Enzymes', 'Immunity', and 'Pathophysiology' for relevant articles and conducted an exhaustive review of the literature to ensure a comprehensive understanding of the topic relying mainly on articles published in the years following 2000.
Results: Overall, 131 articles were analyzed. We observed that low zinc concentrations result in decreased bone mass and growth, reduced antibody production, lower TH1/TH2 ratio, hypothalamic–pituitary–adrenal axis activation, and increased apoptosis rates of cells. On the other hand, high zinc concentrations lead to disrupted homeostasis of other trace elements, alter cytokine production, and act as a cofactor of many catalytic enzymes.
Conclusion: Owing to the countless positive effects of zinc on bone health and immunity, zinc is commonly considered to have favorable impacts on patients with OA. It is evident that zinc prevents the progression of MIA-induced OA. However, plenty of studies indicate detrimental outcomes of zinc on OA as well. Therefore, the management of patients with OA with zinc supplementation might resemble a double-edged sword.

P935
INCREASED BONE MARROW ADIPOSITY IS RELATED TO HIGHER FRACTURE RISK AND LOWER BONE MINERAL DENSITY IN OLDER SWEDISH WOMEN

M. Zoulakis[1], K. F. Axelsson[1], H. Litsne[1], L. Johansson[1], M. Lorentzon[1]

[1]Univ. of Gothenburg, Dept. of Internal Medicine and Clinical Nutrition, Sahlgrenska Osteoporosis Centre, Gothenburg, Sweden

Objective: Recent research suggests that bone marrow adiposity (BMAT) is associated with osteoporosis and increased fracture risk. However, quantifying BMAT can be challenging mostly because the golden standard for assessment is by MRI, a method limited by low availability and high costs. We recently developed a method to quantify BMAT from HR-pQCT) images.[1] This method was able to explain up to 76% of the variation in the MRI-derived bone marrow fat fraction (BMFF) at the ultradistal tibia. This study aimed to investigate if BMAT, derived from HR-pQCT images, was associated with incident fractures and osteoporosis prevalence in older women
Methods: In total, 2984 women aged 75–80 y, from the SUPERB cohort, participated in a population-based study between March 2013 to May 2016 and underwent a comprehensive assessment of bone characteristics including bone densitometry (DXA), and HR-pQCT measurements of the ultradistal tibia at baseline. The BMFF was measured as previously described[1] using HR-pQCT images at the ultradistal tibia. Follow-up of x-ray verified incident fractures data was completed in March 2023. Associations between BMFF, anthropometrics, and BMD, were investigated using correlations, linear and logistic regression. Cox regression was used to study the association between BMFF and incident fractures.
Results: BMFF was inversely associated with BMI ($r = -0.22$, $p < 0.001$) and with total hip BMD ($r = -0.50$, $p < 0.001$; $\beta = -0.43$, $p = 0.001$, after adjustment for age and BMI). During a median follow-up time of 7.3 (4.4, 8,4) y, 797 major osteoporotic fractures (MOF), 1069 any fractures, and 235 hip fractures occurred. Increasing BMFF (per SD) was associated with increased risk of MOF (hazard ratio [HR] = 1.28, 95%CI 1.19–1.38), any fracture (HR = 1.23, 95%CI 1.16–1.31), and hip fracture HR = 1.34, 95%CI 1.17–1.53), All associations, except for hip fracture, remained significant after adjustments for clinical risk factors (CRFs) and femoral neck BMD (Figure).

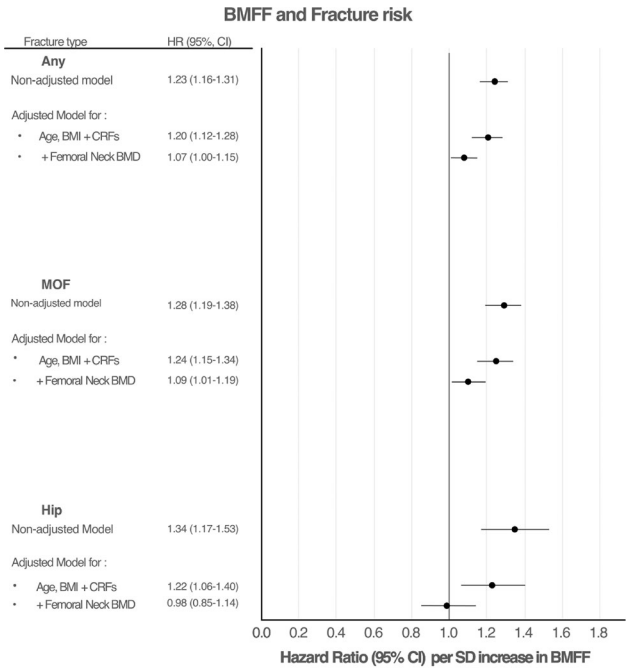


Figure. Forest plot of adjusted and non-adjusted Hazard Ratio (HR) and 95% Confidence Interval (95% CI) per SD increase in bone marrow fat fraction (BMFF) for : Any fracture, Major Osteoporotic Fracture (MOF) and Hip Fracture

Conclusion: Increasing BMFF was associated with lower BMD and with greater fracture risk in older Swedish women.

Reference: (1) Flehr A, et al. Osteoporos Int 2022;33:1545.

P936
THE LUNG IN RHEUMATOID ARTHRITIS: FOCUS ON DIFFUSING CAPACITY OF THE LUNGS FOR CARBON MONOXIDE (DLCO), THE MOST SENSITIVE INDEPENDENT PREDICTOR

M.-L. Anton[1], A. Cardoneanu[1], E. Rezuş[1]

[1]Clinical Rehabilitation Hospital, Rheumatology, Iasi Romania, Iasi, Romania

Objective: DLCO represents the most sensitive independent factor of the growing burden era of rheumatoid arthritis with interstitial lung disease (RA-ILD). This study aimed to highlight the importance of DLCO as a predictor of ILD progression in RA, beside the pattern on high-resolution chest CT (HRCT) and the double seropositivity of disease.

Methods: This prospective cohort study, carried out between August 2022 and March 2024, included 60 RA patients with ILD, fulfilling the 1987 ACR or 2010 ACR/EULAR classification criteria. Important attention was paid to respiratory functional tests abnormalities, immunological changes, and specific lung pattern on HRCT. Patients with current malignancies, active infections or overlap syndrome were excluded from our study.

Results: 60 RA patients, mostly women with a mean age of 65.54 ± 10.58 years old and the mean age of onset of RA 52.58 ± 11.36 years old. The proportion of patients with decreased DLCO was 70% at the side of RA seropositivity in 60% cases. By statistical tests we found significant correlations between DLCO and age, double seropositivity and specific pattern on HRCT.

Conclusion: ILD, an underrecognized disease, may be considered one of the most serious of all extra-articular manifestations in RA, the risk of mortality being triple in these cases. Our results were significant for the coexistence of decreased DLCO, HRCT pattern and double seropositivity of disease.

P937
HEALTH RELATED QUALITY OF LIFE (HRQOL) AMONG PATIENTS WITH OSTEOPOROTIC VERTEBRAL FRACTURES

N. A. Shohor[1], J. F. Leong[2], S. L. Panduragan[1], S. A. Mokhtar[3]

[1]Faculty of Medicine, Universiti Kebangsaan Malaysia, [2]Dept. of Orthopedics and Traumatology, Hospital Canselor Tuanku Muhriz, [3]Dept. of Orthopedics and Traumatology, Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia

Objective: To assess the impact of osteoporotic vertebral fractures (OVF) on health-related quality of life (HRQOL) among patients with osteoporosis.

Methods: A total of 45 Malaysian women aged 55 years and older were enrolled in this cross-sectional study using the Short-Form 36 (SF-36) questionnaire. The collected data were analysed using the Statistical Package for Social Sciences (SPSS).

Results: HRQOL has 10 domains, whereas the locations of fracture were lumbar vertebrae and thoracic vertebrae. The mean bodily pain (44.48 ± 7.93 vs. 38.37 ± 7.28) and social functioning (49.32 ± 10.34 vs. 41.43 ± 13.58) scores were found to be significantly higher in the lumbar region than the thoracic vertebrae ($p < 0.05$). The mean physical component summary (PCS) score was also found to be significantly higher in the lumbar vertebrae (38.81 ± 6.60) than in the thoracic vertebrae (34.35 ± 7.51) ($p < 0.05$).

Conclusion: The researcher concluded that the lumbar location of the fracture has a higher or better HRQOL compared to the thoracic fracture location. This could probably be due to the fact that the rigidity of the lumbar spine is less than that of the thoracic spine, which is more rigid by nature. Proper management of OVF indirectly provides better PCS scores in patients with lumbar fractures than thoracic when the nature of the spine is taken into consideration. Looking at the increasing trend of HRQOL as an indicator of a patient's overall health, increasing awareness and understanding o how OVF affects the patient's quality of life are crucial to be carried out.

P938
ASSOCIATION BETWEEN PAIN AND DISABILITY AMONG PATIENTS WITH OSTEOPOROTIC VERTEBRAL FRACTURES (OVF)

N. A. Shohor[1], J. F. Leong[2], S. L. Panduragan[1], S. A. Mokhtar[2]

[1]Faculty of Medicine, Universiti Kebangsaan Malaysia, [2]Dept. of Orthopedics and Traumatology, Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia

Objective: To determine the association between pain and disability among patients with OVFs.

Methods: A total of 45 Malaysian women aged 55 years and older were enrolled in this cross-sectional study using a questionnaire consisting of the Oswestry disability index (ODI) and the visual analogue scale for pain (VAS). The collected data were analysed using the Statistical Package for Social Sciences (SPSS).

Results: 86.7% of the subjects with an average age of 72.78 (SD = 7.30) years old had other medical problems, and the mean BMI of the respondents was 26.21 (SD = 4.05) kg/m^2 with 42.4% of them had normal BMI. The mean ODI percentage was 37.82% (SD = 16.92) with the majority (51.1%) having moderate disability, with a mean

VAS score of 5.23 (SD = 1.37). Almost 69% of the respondents had a moderate VAS score. The result revealed that there was a significantly strong association between the ODI and the VAS score ($p < 0.001$) among patients with osteoporotic vertebral fractures.
Conclusion: The management of osteoporosis needs to be implemented effectively and efficiently among doctors, nurses, and other health care professionals because the major complication of osteoporosis is the increase in fragility fractures leading to morbidity, mortality, and decreased quality of life, referring to the strong association between the ODI and the VAS score in this study. Furthermore, early detection and early treatment will directly and significantly improve their quality of life and enable them to embrace the ageing process with manageable, minimal medical complications.

P939
PREVALENCE AND PREDICTING FACTOR OF LOW BACK PAIN (LBP) IN JOB PERFORMANCE AMONG NURSES IN UNIVERSITY HOSPITAL

N. A. Shohor[1], J. F. Leong[2], S. L. Panduragan[1], S. A. Mokhtar[2]

[1]Faculty of Medicine, Universiti Kebangsaan Malaysia, [2]Dept. of Orthopedics and Traumatology, Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia

Objective: To determine the prevalence and predicting factor of low back pain in job performance among nurses in tertiary university hospitals.
Methods: A quantitative cross-sectional study with a self-administered questionnaire was used to collect data among 132 nurses in the Clinical Training Centre (CTC) of a university hospital. The collected data were analysed using the Statistical Package for Social Sciences (SPSS).
Results: The prevalence of nurses who suffer from LBP was 112 (84.8%) in the previous 12 months. The highest risk for LBP among nurses was carrying patients to bed with 106 nurses (94.7%), moving or supporting patients to bed with 108 nurses (96.4%), pushing wheel chairs or patient beds with 109 nurses (97.3%), and pushing heavy objects with 96 nurses (85.7%). This study shows that there was no significant association between LBP among nurses and socio-demographic variables such as gender, age, and BMI. However, this study also revealed that the predicting factor for LBP among nurses that affects their job performance is the last episode of LBP taken medication ($R = 0.076$, $F = 10.717$, p value < 0.003), support or move patients to bed ($R = 0.122$, $F = 9.000$, $p < 0.014$) and pushing heavy objects ($R = 0.149$. $F = 7.467$, $p < 0.048$).
Conclusion: The highest prevalence of low back pain and work-related back injuries reported among nurses compared to other occupational groups and a higher risk of functional disability may affect the standard and quality of patient care as nurses are the frontline workers who provide direct care to the patients. The result of this study may be used to plan future actions focusing on eliminating or reducing the risks of low back pain. Different strategies, guidelines, and activities that authorise individuals and provide knowledge to manage and prevent low back pain among nurses need to be implemented.

P940
COMPARISON OF PROTEIN INTAKE ASSESSED FROM 24-H URINE SAMPLES, FOOD DIARIES AND WEIGHED PROTEIN POWDERS IN COMMUNITY-DWELLING ADULTS WITH SARCOPENIA: RESULTS FROM THE ENHANCE STUDY

N. Amini[1], A. Devriendt[1], L. Lapauw[1], J. Dupont[1], K. Verbeke[1], L. Vercauteren[1], S. Verschueren[1], J. Tournoy[1], E. Gielen[1]

[1]KU Leuven, Leuven, Belgium

Objective:
1. To determine total protein intake by nitrogen-excretion in 24-h urine samples (dietary + supplemental protein/placebo)
2. To compare total protein intake estimated from a combination of 4-d food diaries (dietary protein) and weighed protein powders (supplemental protein/placebo) against total protein intake estimated from 24-h urine samples (dietary + supplemental protein/placebo).
Methods: Longitudinal data of the ongoing Exercise and Nutrition for Healthy AgeiNg (ENHANce) study were used. ENHANce is a 5-armed triple blinded RCT in older adults ($\geq$ 65 y) with EWGSOP2-defined sarcopenia. This RCT aims to assess the effect of combined anabolic interventions (protein supplement, omega-3 supplement and physical exercise) vs. placebo or no intervention on physical performance (12-week intervention). The amount of protein/placebo supplement was individualized to achieve a mean total intake of 1.5 g/kg BW/d. Total protein intake in participants was determined by a combination of weighed protein powders and 4-d food diaries and by nitrogen-excretion in 24-h urine samples at 8 different measurement moments in the intervention period. Mean differences and Lin's concordance correlation coefficients were used to assess agreement between the two methods.
Results: After 12 weeks, nitrogen analysis showed that the mean total protein intake was 1.31 g/kg BW in the protein powder group ($n = 33$) and 0.86 g/kg BW in the placebo group ($n = 17$). Mean protein intake according to the combination of food diaries and weighed powders (87.0 g/d) was overestimated by 7.7 g/d compared to the method using 24-h urine samples (79.3 g/d). Throughout the whole intervention period, correlation coefficients between protein intake derived from the combined method and 24-h urine samples varied between 244–0.565 and 0.382–0.641 in the placebo group and protein group, respectively.
Conclusion: Protein supplementation increased protein intake to meet the daily recommended amount of protein intake for older adults (1.0–1.2 g/kg BW), but not that for sarcopenic older adults (1.5 g/kg BW). Protein intake in sarcopenic older adults can be estimated with fair to moderate accuracy by the combination of food diaries and weighed powders.

P941
SERUM 25-HYDROXYVITAMIN D UP TO 60 NG/ML IS NOT ASSOCIATED WITH FALLS IN POSTMENOPAUSAL WOMEN

N. Binkley[1], C. Sempos[2], G. Borchardt[1], J. Lappe[3]

[1]Univ. of Wisconsin-Madison, Madison, [2]Vitamin D Standardization Program, Havre de Grace, [3]Creighton Univ. School of Nursing, Omaha, USA

Objective: Falls are common and cause fractures. High circulating 25(OH)D may increase falls risk; thus, recent guidance recommends 25(OH)D not exceed 50 ng/mL. Prior falls studies have not reported standardized 25(OH)D (s25D) data. The purpose of this planned secondary analysis of a 4-y calcium/vitamin D supplementation trial was to evaluate the association of s25D with falls.
Methods: This study recruited 2,303 postmenopausal women. The analytic dataset consisted of pooled concatenated data from years 2–4 ($N_{Total} = 5{,}732$). Serum 25(OH)D was measured annually and subsequently retrospectively standardized using Vitamin D Standardization Program methods. Falls were recorded by diary. Incidence for $\geq$ 1 fall and $\geq$ 2 falls was assessed by s25D group

($\leq$ 20, 20- $<$ 30, 30- $<$ 40, 40- $<$ 50, 50- $<$ 60 and $\geq$ 60 ng/mL) using multivariable logistic regression.
Results: Mean (SD) baseline s25D was 32.6 ng/mL (8.3) with no difference between supplement and placebo groups. s25D increased to 41.3 ng/mL at year 2 in the supplement group then remained stable. By s25D group, incidence for $\geq$ 1 fall varied from 22–32% (p = 0.19). For $\geq$ 2 falls incidence varied (p = 0.03) from 6% ($<$ 20 ng/mL) to 17% ($\geq$ 60 g/mL.) There was no significant association between s25D and $\geq$ 1 fall. Those with s25D $\geq$ 60 ng/mL had a higher adjusted odds of $\geq$ 2 falls (OR = 1.99 $\pm$ 1.2–3.3) compared to women with s25D of 30- $<$ 40 ng/mL.
Conclusion: s25D up to 60 ng/mL was not associated with greater risk for $\geq$ 1 or $\geq$ 2 falls. Women with a s25D $\geq$ 60 ng/mL were at higher odds for $\geq$ 2 falls.

P942
RHEUMATOLOGIST'S POINT OF VIEW REGARDING THE FUTURE OF HIS SPECIALTY

N. Bouhedja[1], L. Poulain[1], X. Grapton[2], P. Lemesle[3]

[1]Private practice, La Garenne Colombes, [2]Hopital Suisse de Paris, Issy Les Moulineaux, [3]Hopital Rives de Seine Courbevoie, Courbevoie, France

Objective: Evaluate the outcome of rheumatology by the 51 rheumatologists (Rh) from the CREER group.
Methods: Average age 58, 40% M/W, $>$ 58, 4 M/W, practice: M = W + 12y, private practice (PP) 30%, mixed 50%, salaried (S) 20%. M teleconsults 16% / 48%, W (twice as much if $<$ 58yo).
Results: Patients referred:
- infiltration (If): general practitioner (Gp) M 41/W 27%, orthopedist (0r) 10% M = W;
- osteoporosis (OP): Gp 23/20%, gynecologist (Gy) 12/8%, Or 4% M = W;
- osteoarthritis (OA) Gp 39/33%, physiotherapist (Ph) 6/10%, Or 11/4%;
- inflammatory rheumatisms (IR): Gp 56/26, others 17/8%.

Rh comes in second rank after Ph and osteopaths 67%, Or 52%, Acupuncturist 9%. Rh is consulted (except for Gp) in 2nd 55%, 3rd 32%, 4th 8%, 1st in 4%. Feeling of a downgrade perceived by Rh: M $<$ 58 yo yes 80% S = PP, $>$ 58 yo yes 72% PP $>$ S, W $<$ 58 yo no 55% PP $>$ L, $>$ 58 yes 80% S = PP. Factors influencing our patients: Gp 52%, Net 22%, Surroundings 15%, associations, experts cited last. Rh consulting their internet profile: M no 58% but yes for M $<$ 58 in 87%, $>$ 58 no 87%, W no 64%, $<$ 58 yo 60%, $>$ 58 70%. Transfer of tasks, Rh opinion: Against M 61/W 52%, $>$ 58 75/54%. Substitution by pharmacist no 70%. Advanced practice nurse (APN): Infiltration no 94%, 80% yes for therapeutic education, 52% yes for screening yes. Task transfer is necessary: M 70% no, W 60% yes, consistent yes 60/66%, secure no 88/50%. Who is responsible: Rh 50%, performer 50%, Shared responsibility 50% M = W. Vision of the future of rheumatology specialty: Regression 83/70%, If towards internist conceivable 75/65%, not desirable 77/95. OA to Or possible 33/41%, not desirable 95/100%, OP to Gp conceivable 33/5%, not desirable 83/98%. Out of 17 solutions for safeguarding rheumatology, the 4 most frequent: internships at private practice, increasing the doctors' fees for the consultation, raising patients' awareness of the need for rheumatology via the media and medical associations, vigilance and concern about task transfers.
Conclusion: Patients are referred primarily by Gp. RH perceive a downgrade of their specialty W = M, except W $<$ 58 yo and S $>$ PP. Should remain dedicated to Rh patients: screening and, above all, therapeutic. Education could be transferred to APN, which seems necessary for W but not for M. What about individual responsibility?

P943
ASSESSMENT OF MENTAL STATUS OF PEOPLE LIVING WITH KNEE OSTEOARTHRITIS: A SYSTEMATIC REVIEW

N. C. Ojielo[1], N. R. Njeze[1]

[1]Univ. of Nigeria Teaching Hospital, Enugu, Nigeria

Objective: Knee osteoarthritis (KOA) is a prevalent chronic joint condition that significantly affects the well-being of individuals as well as the quality of life, and currently available treatments exhibit limited effectiveness. While there is no definitive cure for knee osteoarthritis, individuals typically contend with the condition for an extended period, lasting approximately 30 years. Existing research predominantly focuses on assessing the prevalence, risk factors, and conventional medical interventions, often overlooking the potential influence of this enduring ailment on their mental health. This systematic review aims to investigate the mental health implications for individuals living with knee osteoarthritis, directing healthcare providers' attention to this co-occurrence.
Methods: The search spanned electronic databases such as MEDLINE, PubMed, Cochrane Library, Google Scholar, and Embase, adhering to evidence-based guidelines from inception until October 2023. Inclusion criteria encompassed studies presenting data on depressive symptoms and anxiety in individuals with osteoarthritis. Out of 948 articles reviewed based on titles and abstracts, 108 underwent a full-text assessment, and data were extracted according to pre-specified criteria for 74 articles, along with 24 identified through bibliographic review (n = 98).
Results: 24 studies fulfilled the inclusion criteria, involving 14,900 patients with knee osteoarthritis. Anxiety and depression emerged as consistently reported mental health issues, delineated by diverse screening criteria and thresholds. The pooled prevalence of depressive symptoms in osteoarthritis was 19.9% (95%CI: 14.8–23.5%, n = 9,811), while the corresponding prevalence for anxiety symptoms was 20.8% (95%CI: 15.1–27.9%; n = 1,142). P-value is 0.043. Relative risk analysis indicated a depression risk of 1.14 (95%CI 0.58–1.52, three studies, n = 902) among individuals with osteoarthritis compared to those without. The relative risk for anxiety was 1.21 (95%CI: 0.54–3.48; three studies, n = 718) compared to individuals without osteoarthritis.
Conclusion: Approximately one in five individuals with osteoarthritis experiences symptoms indicative of depression and anxiety. However, while statistically significant, there is no direct evidence supporting a definitive increase in anxiety and depression among those with osteoarthritis. We advocate for more robust, methodologically rigorous, large-scale randomized controlled trials to address this research question. Furthermore, healthcare providers are encouraged to heighten their awareness of depressive symptoms in patients with osteoarthritis.

P944
RELATIONSHIP OF LUMBO-SACRAL ANGLE TO DEGREE OF LOW BACK PAIN AMONG NIGERIAN ADULTS ORLU IMO STATE

C. Udeagu[1], N. C. Ojielo[2], N. R. Njeze[2]

[1]Dept. of Radiology, Imo State Univ. Teaching Hospital Orlu, Imo, [2]Univ. of Nigeria Teaching Hospital, Enugu, Nigeria.

Objective: Low back pain (LBP) refers to pain and muscle stiffness experienced in the back region below the rib cage and above the buttocks. Lumbo-sacral angle (LSA) is the angle formed with a line drawn along the top of the first sacral vertebra and intersecting with another line parallel to the horizontal. This study aims at determining the relationship between LSA and severity of low back pain in Nigerian adults.
Methods: Patients referred to Radiology Department of Imo State University Teaching Hospital Orlu, for lumbo-sacral radiographs on account of low back pain were recruited in this study from 1 April 2019 to 29 November 2019. Data were collected and analyzed using statistical package for social sciences (SPSS) version 20.0.window software.
Results: There were four hundred respondents in this study. Their age ranged from 18–109 years with mean age of 63.5 y. Age group from 50–60 y recorded the highest frequency while age group from 30–40 y yielded the lowest frequency. Male to female ratio was 1:1.4. Mean age at onset of chronic LBP is 49 $\pm$ 16. 7 y and mean age at onset of acute low back pain is 48 $\pm$ 17.7 y. The normal LSA is 4^{o} and LSA for mild LBP is 43 $\pm$ 6.3°, LSA for moderate LBP is 40 $\pm$ 8.5° and LSA for severe LBP is 38 $\pm$ $9.1^{o.}$
Conclusion: Increased severity of low back pain among adult Nigerians is correlated with decreased lumbo-sacral angle. LBP is more prevalent in female gender and age group 50 y and above.

P945
DETERMINATION OF THE EFFECT OF OVERWEIGHT ON LOW BACK PAIN (LBP) IN NIGERIAN ADULTS IN ORLU IMO STATE.

C. Udeagu[1], N. C. Ojielo[2], N. R. Njeze[2]

[1]Dept. of Radiology, Imo State Univ. Teaching Hospital Orlu, Imo, Nigeria, [2]Univ. of Nigeria Teaching Hospital, Enugu, Nigeria

Objective: LBP is the most prevalent musculoskeletal condition and one of the most common causes of disability in the world. On any given day, an estimated 6.5 million people in the USA are bedridden because of back pain and approximately 1.5 million new cases of back pain are seen by physicians each month. More than 85% of LBP has no specific cause. The objective is to determine the effect of overweight on LBP in Nigerian adults in IMSUTH Orlu.
Methods: 400 LBP patients were used in this study in IMSUTH Orlu between the 1 April to 29 November 2019. The weight of these patients was measured by asking them to remove any materials that could alter the patient's weight. This sparsely clothed patient was then asked to climb the scale; and stand without support, the weight observed was recorded in kilograms using a Camry weighing scale, made in China model BR9011 2008. Patients' heights were measured in meters by asking the patients to remove their footwear and stand erect on a height scale. A ruler was placed on top of the patient's head; the corresponding reading was taken as the patient's height in meters. BMI of these patients were used to classify them into normal BMI of 18.5–24.5, overweight BMI $>$ 24.5 and underweight BMI $<$ 18.5. Data collected was analyzed using SPSS version 20.0.window software.
Results: This study shows that a higher population of LBP respondents are overweight (64%). It was then shown that overweight was a major risk factor for LBP. The confidence level of this study is 95%.
Conclusion: Being overweight was a major risk factor for LBP in Nigerian adults in IMSUTH Orlu Imo State. Thus, weight loss is highly recommended.

P946
USING BONE MINERAL DENSITY AND TRABECULAR BONE SCORE FOR PREDICTION OF LOW-ENERGY VERTEBRAL FRACTURES

N. Dimic[1], B. Stamenkovic[1], S. Stojanovic[1], J. Nedovic[1], A. Dimic[2], J. Jocic[1], J. Cvetkovic[1]

[1]Institute for treatment and rehabilitation "Niska Banja", Nis, [2]Polyclinc Natus, Aleksinac, Serbia.

Objective: TBS assesses bone microarchitecture and can be used to predict the risk of osteoporotic fractures alone or in addition to BMD. In retrospective case–control study (13 years of monitoring), we compared ability of TBS and lumbar spine BMD (BMD L1-L4) to predict low-energy vertebral fractures. Inclusion criteria were female gender, aged 45–85 years of age in postmenopausal period with clinical risk factors for osteoporosis. Subjects with secondary osteoporosis are not included in the research.
Methods: Both diagnostic tests (BMD L1-L4 and TBS) were evaluated to predict probability of low-energy vertebral fractures using the Bayesian "OR rule" (diagnosis is negative if both diagnostic test are negative/diagnosis is positive if only one diagnostic test is positive) or using the "AND rule" (the diagnosis is positive if both tests are positive/diagnosis is negative if one of tests is negative). 9 out of a total of 101 women had a documented low-energy vertebral fracture (diagnosed by MRI, CT scan or conventional radiography).
Results: TBS and BMD L1-L4 showed similar ability to predict low-energy vertebral fractures, with a positive predictive value (PPV) of 15.2% and 16.1%. The negative predictive values (NPV) were 93.4% and 92.9%. If we compare individually each diagnostic tool: "OR-rule" significantly increased the NPV to 94.58%; "AND-rule"—there were no statistically significant differences.
Conclusion: Using LS-BMD and TBS together may improve the predictive value in diagnosing low-energy vertebral fractures. Also, there is a significant nonexistence of low-energy fractures in women with both negative diagnostic tests.

P947
CHANGE IN BONE MINERAL DENSITY IN PATIENTS WITH SYSTEMIC SCLEROSIS: ONE YEAR FOLLOW-UP

J. Jocić[1], B. Stamenković[2], J. Nedović[1], S. Stojanović[2], N. Dimić[1], J. Cvetković[1]

[1]Institute for Treatment and Rehabilitation "Niška Banja", [2]Institute for Treatment and Rehabilitation "Niška Banja" Faculty of Medicine, Univ. of Niš, Niš, Serbia

Objective: Patients with systemic sclerosis (SSc) may be at increased risk for reduced bone density due to chronic inflammation, malabsorption or malnutrition, corticosteroid use, and the risk of

osteoporosis is related to the severity and duration of the disease.
Methods: the cross-sectional study included 44 patients who met the ACR criteria for SSc, with an average age of 63.52 ± 8.55 y and a mean duration of the disease of 12.02 ± 6.87 y. Out of the total number, 20 (45.45%) patients had diffuse (dSSc) while 24 (54.55%) had a limited form of the disease (lSSc). BMD was measured on the lumbar spine and neck of the femur, using DXA on the Hologic Discovery device, in the period from January 2020 to December 2023 at the Institute for Treatment and Rehabilitation in Niška Banja. BMD is expressed in absolute values (g/cm^2) and in the form of T-score. All patients underwent a clinical examination, standard and specific laboratory tests—anticentromeric antibodies (ACA), antibodies to topoisomerase-I (ATA) and total antinuclear antibodies (ANA). Based on the therapeutic modality, we divided the patients into two groups: patients who were previously treated with cyclophosphamide and patients treated with other disease-modifying drugs (azathioprine, chloroquine and methotrexate)—who never had cyclophosphamide in their therapy. Also, we divided all patients into those with and without glucocorticoids, and then we divided the group with GK into two subgroups in relation to the therapeutic dose (up to 10 mg and over 10 mg/d). The groups were comparable in relation to other proven risk factors for osteoporosis (smoking, menopause, age, etc.). The data were processed with descriptive and analytical statistical methods using statistical software SPSS Statistics 22.0.
Results: Out of the total number of respondents, 25/44 (56.82%) had positive ACA, while 19/44 (43.18%) had positive ATA. By comparing the bone density on the spine and hip in patients with ACA and ATA before and after the application of the basic drug, a decrease in BMD was observed over time in both groups; a greater decrease in bone density was observed in ACA-positive patients (deterioration at the hip 21.8 vs. 13.5%; at the spine—24.1 vs. 6.4%, $p < 0.001$). In the group of subjects treated with cyclophosphamide—8/44 (18.18%), comparing bone density before and after therapy, we found a decrease in bone density at the neck of the femur by 26.6% ($p = 0.002$), while this decrease was smaller in female patients on therapy with other disease-modifying drugs—14.3%, indicating a statistically significant intergroup difference ($p < 0.0001$). A total of 34/44 (77.27%) were also on GC therapy. In relation to the GK dose, the patients were divided into two subgroups: 18 (52.94%) patients had a GK dose of up to 10 mg—an average of 8.06 mg/d. (average cumulative dose 8760 g) and 16 (47.06%) patients with GK dose over 10 mg/d—average 22.5 mg (average cumulative dose 10.950 g). The group of patients with a higher dose of GK had a significant decrease in bone density both at the spine and at the hip at the time of surgery (hip 18.6 vs. 13.5%; spine—15.2 vs. 11.6%, $p < 0.001$). Out of the total number, 16/44 (36.36%) patients with SSc had normal BMD before therapy, 20/44 (45.45%) had osteopenia, and 8/44 (18.19%) had osteoporosis. At the time of surgery, after therapy, 13/44 (29.55%) had normal BMD findings, 20/44 (45.45%) new osteopenia findings, while 11/44 (25%) patients had osteoporosis. The summary results in relation to the therapeutic approach indicate that the greatest decrease in bone density was recorded in patients treated with cyclophosphamide and GK in a dose of more than 10 mg/d.
Conclusion: Our results indicated a higher number of patients diagnosed with osteoporosis after one year of follow-up. Patients with + ACA, treated with CYP and GK in a dose higher than 10 mg/d are at special risk.

P948
OSTEOMALACIA FROM RENAL TUBULE ACIDOSIS

N. Elias[1], M. Curria[1], L. Caldas[1], M. Perez Abdala[2]

[1]Hospital Britanico de Buenos Aires, Buenos Aires, [2]Hospital regional Dr Ramon Carrillo, Santiago del Estero, Argentina

Renal tubular acidosis (RTA)'s prevalence is around 0.46/10,000 inhabitants. It presents with metabolic acidosis with normal anion GAP and is caused by an altered mechanism of renal tubules that facilitate the reabsorption of HCO3 and the secretion of hydrogen ions of both. Osteomalacia is a disease characterized by altered mineralization. Patients with this condition present bone pain, weakness and pseudofractures. The aim of this clinical is to describe the bone impact that RTA can generate.
Case report: 30-year-old male, referred from orthopedic surgeon for spontaneous bilateral hip fracture of 6 years' duration. In the anamnesis he reported pain in the lower back and both hips. Laboratory: calcium (Ca): 9.9 mg/dl (VR: 8.8–10 mg/dl), phosphorus (P): 2.4 mg/dl (VR: 2.5–5.6 mg/dl), alkaline phosphatase (ALP): 1551 mg/dl (VR: < 270 mg/dl), PTH: 22 pg/ml (VR: 10–55 pg/ml), 25(OH)VitD: 18 ng/ml (VR: 25–80 ng/ml), TSH: 2.97 mIU/L (VR: 0.37–4.7 mIU/L), urinary phosphorus: 630 mg/d (VR: 300–800 mg/d), urine creatinine: 1484 mg/d (VR: 500–2000 mg/d), urine sodium: 290 mEq/d d (VR: 40–220 mEq/d), urinary potassium: 48 mEq/d (25–125 mEq/d), calcium-creatinine ratio: 0.23 mg/mg (VR: ± 0.2 mg/d). Bilateral renal ultrasound: not lithiasis. A decrease in sodium was indicated, vitamin D and hydrochlorothiazide was prescribed. New fractures were found in both femoral shafts. New laboratory was requested: Ca: 9 mg/d, P: 2.3 mg/dl, FAL: 503 mg/dl and an acid–base state, pH: 7.31 (7.35–7.45), bicarbonate (HCO3-): 20 mmol/l (VR: 22–26 mmol/l), renal tubular acidosis was diagnosed.
Conclusion: RTA is an important factor in the cause of osteomalacia due to vitamin D deficiency. It should be considered in case of no or partial response to the treatments performed. Both clinical entities, if not treated promptly, could lead to organic complications and life limitations.

P949
SOCIOECONOMIC INEQUALITY IN OSTEOPOROSIS AMONG OLDER ADULTS IN IRAN: INSIGHTS FROM THE BUSHEHR ELDERLY HEALTH (BEH) PROGRAM

K. Khalagi[1], N. Fahimfar[1], M. Sanjari[1], M. J. Mansourzadeh[1], S. Hajivalizadeh[1], E. Hesari[1], I. Nabipour[2], B. Larijani[3], A. Ostovar[1]

[1]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran, Tehran, Iran, [2]The Persian Gulf Biomedical Sciences Research Institute, Bushehr Univ. of Medical Sciences, Bushehr, Iran, Bushehr, Iran, [3]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran, Tehran, Iran

Kazem Khalagi [1,2], Noushin Fahimfar [1,3], Mahnaz Sanjari [1], Mohammad Javad Mansourzadeh [1], Sepideh Hajivalizadeh [1], Elahe Hesari [1], Iraj Nabipour [4], Bagher Larijani [5], Afshin Ostovar [1,3*]

[1] Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran; [2] Obesity and Eating Habits Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran

Univ. of Medical Sciences, Tehran, Iran; [3] School of Public Health, Dept. of Epidemiology and Biostatistics, Tehran Univ. of Medical Science, Tehran, Iran; [4] The Persian Gulf Marine Biotechnology Research Center, The Persian Gulf Biomedical Sciences Research Institute, Bushehr Univ. of Medical Sciences, Bushehr, Iran; [5] Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran.

Objective: To investigate the socioeconomic inequality of osteoporosis and low BMD among individuals aged 60 y and above in Iran, building on prior research indicating a higher risk of osteoporosis and related fractures among those with lower socioeconomic status (SES).

Methods: The analysis utilized baseline data from the BEH program, encompassing 2266 participants. BMD was assessed using DXA, with osteoporosis defined as T-score $\leq$ -2.5 at the total hip, spine, or neck of the femur, and low BMD as T-score $<$ -1. Participants' SES was determined by constructing indices using principle component analysis of their assets, income, education level, and employment status, followed by their categorization into 5 SES quintiles. The Concentration Index and Lorenz curve were employed to depict the levels of inequality for osteoporosis and low BMD.

Results: The participants' mean (SD) age was 69 (6.3) y, with women comprising 52% of the cohort. The prevalence of osteoporosis and low BMD decreased with higher SES levels (Table 1). The Concentration Index (95%CI) for osteoporosis and low BMD was estimated as -0.11 (-0.14, -0.07), p-value $<$ 0.001 and -0.05 (-0.06, -0.03), p-value $<$ 0.001, respectively. Figures 1 and 2 illustrate the Lorenz curve of SES inequality for osteoporosis and low BMD, respectively.

Conclusion: The findings indicate a concentration of osteoporosis and low BMD among older adults with lower SES levels, emphasizing the need for targeted interventions to address these inequalities.

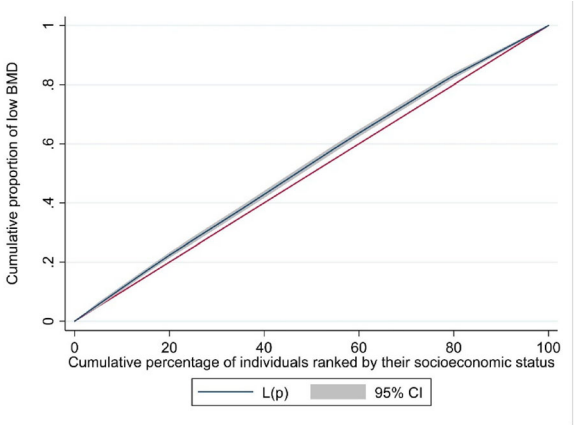


Figure 2. Lorenz curve illustrating SES inequality in low BMD

Table 1. Prevalence of osteoporosis and low BMD across SES quintiles

SES quintiles	Osteoporosis		Low BMD	
	No. (%)	P-value	No. (%)	P-value
1	173 (41.1)	<0.001	351 (83.4)	<0.001
2	132 (33.2)		301 (75.6)	
3	155 (32.6)		370 (77.7)	
4	125 (26.3)		346 (72.7)	
5	115 (23.2)		312 (63)	

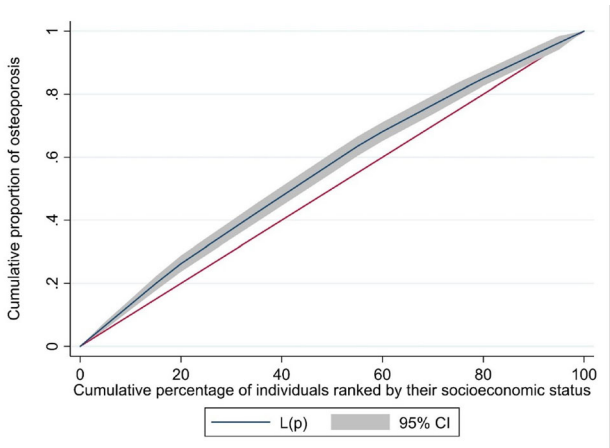


Figure 1. Lorenz curve illustrating SES inequality in Osteoporosis

P950

ASSOCIATION BETWEEN POOR SLEEP QUALITY AND OSTEOPOROSIS IN THE ELDERLY POPULATION: RESULTS OF THE POCOSTEO STUDY

S. Hajivalizadeh[1], N. Fahimfar[1], V. Mohseni[1], S. Akbarpour[2], A. Najafi[2], K. Khalagi[1], M. J. Mansourzadeh[1], M. Sanjari[1], G. Shafiee[3], I. Nabipour[4], E. Hesari[1], P. Khashayar[5], B. Larijani[6], A. Ostovar[1]

[1]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran, [2]Occupational Sleep Research Center, Baharloo Hospital, Tehran Univ. of Medical Sciences, Tehran, Iran, [3]Chronic Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran, [4]The Persian Gulf Marine Biotechnology Research Center, the Persian Gulf Biomedical Sciences Research Institute, Bushehr Univ. of Medical Sciences, Bushehr, Iran, [5]Center for Microsystem Technology, Imec and Ghent Univ., Gent, Belgium, [6]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Poor sleep quality can be associated with a variety of disorders, including osteoporosis, particularly in the elderly population. This study aimed to investigate the association between poor sleep quality and osteoporosis in the Iranian elderly population.
Methods: This was a cross-sectional study on the data of the PoCOsteo prospective cohort study. This cohort was a population-based study conducted on males and females aged 50 years and older to investigate musculoskeletal disorders. Demographic characteristics of the subjects, including age, gender, and years of education, were evaluated using questionnaires. Bone mineral densitometry was evaluated with DXA using the Hologic device to assess the Osteoporosis status. Osteoporosis was defined as a T-score < -2.5 in each site of the femoral neck, total hip, and spine. Sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI). Poor sleep quality was defined as a score > 5 according to the PSQI guideline. The chi-square test was used for statistical analysis.
Results: In total, 1926 (1087 women) individuals with a mean age of 62.2 ($\pm$ 8.1) y were included; of them, 530 (27.5%, 95%CI: 25.7–29.7) individuals were diagnosed with osteoporosis. Poor sleep quality was detected in 909 (47.2%) participants. The mean sleep quality score was significantly higher in osteoporotic (5.7) compared to non-osteoporotic individuals (4.9) (P-value < 0.001). In general, poor sleep quality was reported in 52.6% and 44.6% of participants with and without osteoporosis, respectively (P-value < 0.001).
Conclusion: Poor sleep quality is more prevalent in osteoporotic patients. Hence, investigations into this association and conducting interventions for increasing sleep quality in the elderly population are necessary.

P951
INCIDENCE RATE OF OSTEOPOROTIC FRACTURE IN IRANIAN POPULATION AGED 50 YEARS AND OLDER: IRANIAN MULTICENTER OSTEOPOROSIS STUDY (IMOS)

M. Ahmadi[1], N. Fahimfar[1], M. J. Mansourzadeh[1], V. Mohseni[1], K. Khalagi[1], M. Sanjari[1], S. Hajivalizadeh[1], F. Hajivalizadeh[2], E. Hesari[1], A. Ostovar[3]

[1]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, [2]Center for Non-Communicable Disease Control & Prevention, Deputy of Public Health, Ministry of Health and Medical Education, [3]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Osteoporotic fractures pose a significant health burden among older adults. This study aimed to investigate the incidence rate and risk factors of osteoporotic fractures among a nationally representative sample of the Iranian people aged $\geq$ 50 years old.
Methods: Totally, 1450 men and women aged 50 y or older were selected through a multistage, cluster random sampling and participated in the 4th round of IMOS-2021. BMD was measured using the DXA method with calibrated Hologic devices. All participants were contacted by a trained staff to inquire about occurring osteoporotic fracture at least one year after the baseline measurements. Incidence rates of minor trauma osteoporosis fracture were estimated using Kaplan–Meier method. Multivariable Cox proportional hazard models were used to estimate hazard ratios (HR) for potential risk factors.
Results: Follow-up data was gathered for 1416 (97.7%) individuals participated at the baseline. During a total of 1815 person-years of follow-up, 50 fractures were reported. Notably, 40 fractures were attributed to minor trauma, resulted in an incidence rate of 22.0 (95%CI: 16.1–29.9) per 1000 person-year. The incidence rate was significantly higher in women (28.2, 95%CI:19.5–40.9), compared to the rate in men (14.4, 95%CI: 8.2–25.4). In the univariable analysis, male sex [HR:0.47, 95%CI (0.22–1.004)], diabetes [HR:1.95, 95%CI (0.97–3.91)], serum calcium [HR:2.06, 95%CI (0.88–2.85)], and vitamin D [HR: 1.01,95%CI (1.36–3.13)] were associated with a higher risk of mild trauma fractures. However, only diabetes [HR:2.61, 95%CI: (1.21–5.63)] emerged as a significant risk factor for osteoporotic fractures.
Conclusion: The observed incidence rate of osteoporotic fracture is relatively high in individuals $\geq$ 50 years old particularly among women in Iran. Preventive measures for those with higher fracture risks are necessary to reduce serious outcomes.

P952
BONE MINERAL DENSITY AND HAND GRIP STRENGTH IN POSTMENOPAUSAL WOMEN WITH FOREARM FRACTURES

I. Stets[1], A. Iniushyna[1], D. Kurylo[1], A. Musiienko[1], N. Grygorieva[1]

[1]D. F. Chebotarev Institute of Gerontology, NAMS of Ukraine, Kyiv, Ukraine

Objective: Forearm fractures (FF) are one of the important osteoporotic fractures that increase the risk of other osteoporotic fractures in the future and lead to temporary or even permanent decrease in a patient's functional capabilities. The study aimed to assess BMD and hand grip strength in postmenopausal women depending on previous FF.
Methods. 150 postmenopausal women (average age 66.9 $\pm$ 8.5 y) were examined and divided into 2 groups. Group I consisted of 75 persons without any previous fractures and Group II included 75 females with previous FF (age at the time of the fracture 57.1 $\pm$ 10.1 y, duration of the period after a fracture—10.0 [2.0–16.0] y). BMD, T, and Z-scores of the lumbar spine, hip, femoral neck, and radius were measured using DXA (Hologic Discovery WI, USA, 2016). Muscle strength was assessed by handgrip strength of both hands using a spring hand dynamometer.
Results: The women of both groups did not differ significantly by age and height; however subjects with FF had a significantly lower body mass (67.4 $\pm$ 11.7 and 79.8 $\pm$ 14.9 kg, respectively), BMI (25.8 $\pm$ 4.0 and 30.1 $\pm$ 5.4 kg/m^2), age of menopause (48.1 $\pm$ 4.5 and 50.3 $\pm$ 3.4 years, for all parameters $p < 0.001$) and higher duration of postmenopausal period (19.2 $\pm$ 9.4 and 16.1 $\pm$ 8.5 y, $p < 0.05$). BMDs of the lumbar spine, hip, femoral neck, and radius of females with FF were significantly lower than the parameters of subjects without fractures.
Despite the absence of the BMD differences at broken and unbroken forearm (0.535 $\pm$ 0.089 and 0.538 $\pm$ 0.090 g/cm^2, respectively, 0.622 $\pm$ 0.060 g/cm^2 for Group I), significantly lower muscle strength was established at the side of broken forearm (16.0 [12.0–20.0] kg) compared to other hand (18.0 [15.0–23.0] kg, $p < 0.001$).
Conclusion: Women with previous FF had lower mass, BMI, and age of menopause and worse BMD parameters compared to females without previous fractures. Despite the absence of the BMD differences at the broken and unbroken forearm, hand grip strength was worse at the side of the broken forearm, which confirms the negative FF consequences for a long time after the fracture.

P953
UKRAINIAN GUIDELINE FOR DIAGNOSTIC, PREVENTION AND TREATMENT OF POSTMENOPAUSAL OSTEOPOROSIS

N. Grygorieva[1], V. Kovalenko[2], M. Korzh[3], T. Tatarchuk[4], N. Dedukh[1], S. Strafun[5], Z. Dubossarska[6], G. Protsenko[2], A. Kalashnikov[5], A. Musiienko[1], S. Regeda[7], O. Efimenko[7], E. Chaykivska[8]

[1]D.F. Chebotarev Institute of Gerontology of the National Academy of Medical Sciences of Ukraine, Kyiv, [2]National Scientific Center "The M.D. Strazhesko Institute of Cardiology, Clinical and Regenerative Medicine of the National Academy of Medical Sciences of Ukraine", Kyiv, [3]Sytenko Institute of Spine and Joint Pathology of the National Academy of Medical Sciences of Ukraine, Kharkiv, [4]Institute of Pediatrics, Obstetrics and Gynecology named after Academician O.M. Lukyanova of the National Academy of Sciences of Ukraine, Kyiv, [5]Institute of Traumatology and Orthopedics of the National Academy of Medical Sciences of Ukraine, Kyiv, [6]Dnipro State Medical Univ., Dnipro, Ukraine, [7]Center of Innovative Medical Technologies of the National Academy of Sciences of Ukraine, Kyiv, Danylo Halytsky Lviv National Medical Univ., Lviv, Ukraine

Objective: Postmenopausal osteoporosis (PMO), the most frequent type of systemic osteoporosis is a great challenge worldwide; however, its full value management is insufficient in Ukraine, especially during the war. The latest calculation by the Ukrainian Center of Osteoporosis demonstrated that almost 2 million Ukrainian women have PMO. The first Ukrainian guideline devoted to the management of PMO was published in 2009, so new data and results of high quality research in this field require its revision. However, not all modern strategies for antiosteoporotic treatment are available in Ukraine which became the background for the re-assessment of accessible ones and the creation of this guide. The aim was to develop the guideline on the diagnosis, prevention, and treatment of PMO to improve its management in Ukraine.

Methods: A panel of 13 leading Ukrainian scientists and physicians of various specialties was assembled. A rigorous review of current literature devoted to this topic conducted from January 2013 to June 2023 was performed. The assessment of the level of evidence was used by the GRADE system. An assessment guideline recommendations quality was carried out using the AGREE II tool. Two rounds of voting for the guideline recommendations were held in the summer of 2023.

Results: The 15 key recommendations were formulated and voted on successfully. They included the Expert position related to the diagnosis and differential diagnosis of PMO, the evaluation of osteoporotic fracture risk, the role of bone turnover markers in PMO management, common and alternative methods of diagnosing osteoporosis and fracture risk, and available strategies for the treatment of PMO in Ukraine.

Conclusion: The Ukrainian guideline for the management of PMO, featuring 15 main recommendations, developed through thorough critical analysis and synthesis of modern literature is an important tool for the management of PMO in Ukraine and is recommended by the Ukrainian Association of Osteoporosis for medical community use.

P954
UKRAINIAN CONSENSUS OF DIAGNOSIS, PREVENTION, AND TREATMENT OF VITAMIN D DEFICIENCY IN ADULTS

N. Grygorieva[1], M. Tronko[2], V. Kovalenko[3], S. Komisarenko S[4], T. Tatarchuk[5], N. Dedukh[1], M. Veliky[4], S. Strafun[6], Y. Komisarenko[7], A. Kalashnikov[6], V. Orlenko[2], V. Pankiv[8], O. Shvets[9], I. Gogunska[10], S. Regeda[11]

[1]D.F. Chebotarev Institute of Gerontology of the National Academy of Medical Sciences of Ukraine, Kyiv, [2] V.P. Komisarenko Institute of Endocrinology and Metabolism of the National Academy of Medical Sciences of Ukraine, Kyiv, [3]National Scientific Center "The M.D. Strazhesko Institute of Cardiology, Clinical and Regenerative Medicine of the National Academy of Medical Sciences of Ukraine", Kyiv, [4]Palladin Institute of Biochemistry of the National Academy of Sciences of Ukraine, Kyiv, [5]Institute of Pediatrics, Obstetrics and Gynecology named after Academician O.M. Lukyanova of the National Academy of Sciences of Ukraine, Kyiv, [6]Institute of Traumatology and Orthopedics of the National Academy of Medical Sciences of Ukraine, Kyiv, [7]O.O. Bogomolets National Medical Univ., Kyiv, [8]Ukrainian Scientific and Practical Centre for Endocrine Surgery, Transplantation of Endocrine Organs and Tissues, Health Ministry of Ukraine, Kyiv, [9]National Univ. of Life and Environmental Sciences of Ukraine, Kyiv, [10]O.S. Kolomiychenko Institute of Otolaryngology of the National Academy of Medical Sciences of Ukraine, Kyiv, [11]Center of Innovative Medical Technologies of the National Academy of Sciences of Ukraine, Kyiv, Ukraine

Objective: Vitamin D deficiency (VDD) is a widespread global concern with varying prevalence among different populations. Recent studies in Ukraine confirmed a decreased share of VDD in the general population, but even now this problem remains relevant. Some modern strategies for diminishing VDD in Ukraine are absent and to date, the Ukrainian medical community has lacked national recommendations for diagnosing, preventing, and treating VDD in adults which became the background for its creation. The aim was to develop the consensus recommendations on the diagnosis, prevention, and treatment of VDD to improve its management in Ukraine.

Methods: A consensus was achieved using the Delphi method, utilizing the SurveyMonkey® platform for voting. After approval of the composition of the Consensus Group consisting of 15 leading Ukrainian scientists and physicians of various specialties, establishing the Consensus formation process and structure, creating and correcting the key statements, and conducting two rounds of voting the final 14 Consensus statements were created in the spring of 2023.

Results: Despite a recent reduction in VDD frequency in Ukraine, Experts recommended raising awareness among the medical community and the general population regarding the issue and its solutions, and various positive effects of vitamin D. The screening of the total serum level of 25-hydroxyvitamin D (25(OH)D) was recommended in at-risk groups to achieve target concentrations of 30–50 ng/ml (75–125 nmol/l). To achieve this target, Experts recommended the individual selection of a prophylactic dose of cholecalciferol (800–2000 IU/d for young healthy subjects and 3000–5000 IU/d for patients with diseases and conditions affecting vitamin D metabolism). For VDD treatment, Experts recommended short-term use of higher doses of cholecalciferol (4000–10,000 IU/d) with control of the 25(OH)D level after 4–12 weeks of the treatment and subsequent

use of maintenance, prophylactic doses. Additionally, it was recommended to assess serum 25(OH)D level before the initiation of antiosteoporotic therapy in patients with osteoporosis and its complications to enhance treatment effectiveness and safety.
Conclusion: The Ukrainian Consensus for the management of VDD, consisting of 14 main statements, developed through thorough critical analysis and synthesis of modern literature is an important tool for the management of VDD in Ukraine and is recommended by the Ukrainian Association of Osteoporosis for medical community use.

P955
COMPARISON OF TWO APPROACHES OF BONE BIOLOGICAL MODELING USING MACHINE LEARNING

N. Grygorieva[1], A. Pisaruk[1], V. Gurianov[2], A. Musiienko[1], V. Shatylo[3]

[1]D.F. Chebotarev Institute of Gerontology of the National Academy of Medical Sciences of Ukraine, [2]O.O. Bogomolets National Medical Univ., [3]National Technical Univ. "Ihor Sikorskyi Kyiv Polytechnic Institute", Kyiv, Ukraine

Objective: Numerous studies now confirm the increased risk of osteoporosis in the elderly population. To optimize diagnostic strategies, a combination of various methods is employed, and the calculation of biological bone age (BA) may be important in predicting the disease consequences. Recently, new methodological approaches using mathematical methods have emerged, however, in Ukraine, research employing advanced techniques, particularly neural networks (NN) in BA modeling, remains limited. This study aimed to develop the BA models and compare their accuracy using stepwise multiple regression (MLR) and NN analysis methods.
Methods: In a single-center cohort study, we retrospectively analyzed data from 3071 healthy women aged 40–90 y. The analysis included anthropometric parameters, DXA, and parameters of the 10-y probability of major osteoporotic fractures (FRAX). For developing the BA models, MLR methods were used, and the NN model was constructed using a multilayer perceptron model.
Results: The MLR formula for calculating bone BA was derived, taking into account BMD of the lumbar spine and radius, minimal femoral and hip BMD, TBS, and FRAX. The MLR equation allowed for the calculation of BA with an error of less than 4.9 years for both the study and control groups and demonstrated a strong correlation between calculated and chronological ages ($R = 0.77$; $p < 0.00001$). The use of NN analysis yielded the best results with 6 input variables and 1 internal layer of 7 neurons. The assessment of the connection between BA and chronological age revealed a high correlation coefficient ($R = 0.88$; $p < 0.000001$) with an average age calculation error of less than 3.7 y for both the study and control groups.
Conclusion: A comparison of the accuracy of both models of BA showed a significant advantage of the deep learning NN method. However, it should be noted that the use of a trained NN model requires specialized software, whereas the MLR formula can be employed without additional costs.

P956
DOES SARCOPENIA INFLUENCE THE COURSE OF OSTEOARTHRITIS IN POSTMENOPAUSAL WOMEN?

N. Zaverukha[1], A. Musiienko[1], N. Grygorieva[1]

[1]D.F. Chebotarev Institute of Gerontology of the National Academy of Medical Sciences of Ukraine, Kyiv, Ukraine

Objective: To detect the peculiarity of pain, physical activity, quality of life, and muscle strength in females with knee osteoarthritis (OA) depending on the risk of sarcopenia (SP).
Methods: We have examined 95 postmenopausal women (mean age 65.4 ± 8.0 y) with knee OA (grade 2–3 according to Kellgren & Lawrence classification) and divided them into 2 groups. Group I –33 females without high risk of sarcopenia, Group II – 62 women with high risk of SP detected by Questionnaire to Rapidly Diagnose Sarcopenia (SARC-F ≥ 4 points). All patients have undergone Knee injury and Osteoarthritis Outcome Score-12 (KOOS-12) questionnaire (subscales: pain, function daily living, and quality of life) and a "stand up from a chair" test.
Results: Women of the two groups did not differ in height (162.7 ± 5.3 vs. 160.7 ± 5.7 cm, $p > 0.05$) and body weight (79.8 ± 20.0 vs. 80.9 ± 10.9 kg, $p > 0.05$). According to the KOOS-12 questionnaire, the result of the pain subscale was significantly higher in patients with OA and a high risk of SP (43.7 [31.3–62.5] points), compared to females without the high risk of SP (68.8 [50.0–93.8] points, $Z = 3.6$, $p < 0.05$). The subscale of function and daily living also showed significantly higher (i.e., worse) result in Group II (43.8 [31.3–68.8] points) compared to Group I (75.0 [56.3–100.0] points, $Z = 4.1$, $p < 0.05$), as well as the quality of life—43.8 [37.5–62.8] vs. 75.0 [43.8–87.5] points in Group II and I respectively ($Z = 3.0$, $p < 0.05$). Patients with OA without the high risk of SP performed significantly quickly "stand up from a chair" test (14.0 [10.0–16.0] sec compared to women with OA and high risk of SP (18.0 [11.0–23.0] sec, $Z = 2.4$, $p < 0.05$).
Conclusion: The combination of OA and high risk of SP was associated with more pronounced knee pain, lower function, daily living, and quality of life and should be taken into account in the women of the older age groups.

P957
TRABECULAR BONE SCORE IN PATIENTS WITH PRIMARY HYPERPARATHYROIDISM

M. Tsagareli[1], E. Giorgadze[1], T. Sulikashvili[1], T. Zerekidze[1], N. Jeiranashvili[1]

[1]National Institute of Endocrinology, Tbilisi, Georgia

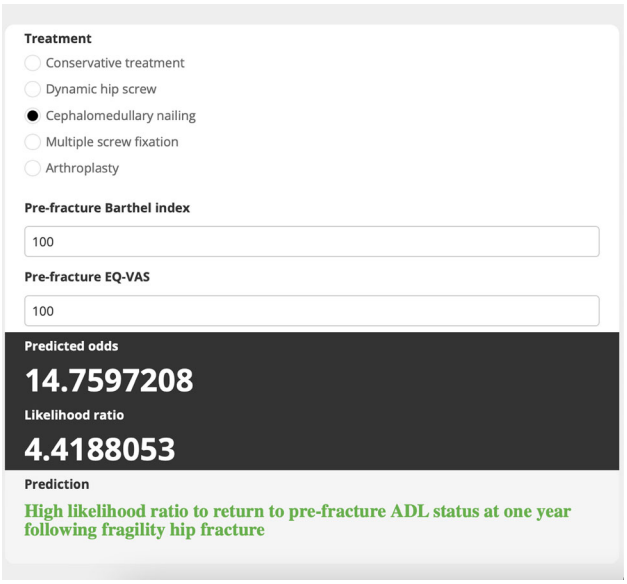
Objective: Primary hyperparathyroidism (PHPT) is associated with increased risk of fractures. The aim of our study was to assess whether PHPT is related to impaired BMD and TBS.
Methods: 38 women with PHPT were enrolled in the study. lumbar spine (LS), total hip and radius 33% BMD values were obtained using DXA, TBS was calculated using TBS iNsight software.
Results: BMD was lower in patients with PHPT compared to control group. Mean LS BMD T-score was ($-2,4 \pm 0,12$ SD), FN BMD T-score—($-2,0 \pm 0,14$ SD), radius 33% BMD T-score—($-2,5 \pm 0,1$ SD). 37% of patients had degraded TBS $< 1,2$.
Conclusion: PHPT is associated with cortical BMD and Trabecular microarchitecture deteriorations. TBS can be a useful measurement for the assessment of fracture risk in patients with PHPT.

P958
DEVELOPMENT OF CLINICAL PREDICTION RULES FOR PREDICTING PATIENTS' ABILITY TO RETURN TO PRE-FRACTURE ACTIVITIES OF DAILY LIVING STATUS AT ONE YEAR FOLLOWING FRAGILITY HIP FRACTURE

N. Kitcharanant[1], P. Atthakomol[1], J. Khorana[1], P. Phinyo[1], A. Unnanuntana[1]

[1]Chiang Mai Univ., Chiang Mai, Thailand

Objective: To develop the multivariable clinical prediction rules to predict patients' ability to return to pre-fracture activities of daily living status at one year following fragility hip fracture.
Methods: The clinical prediction rule was developed and internally validated using a retrospective data from patients who admitted with fragility hip fracture at Siriraj hospital (a university affiliated tertiary care center) during February, 2017 and April, 2019. Multivariable fractional polynomial algorithm was used to fit multiple continuous predictors into a binary logistic regression model.
Results: A total of 421 patients were included. Of these, 324 patients (77%) were able to return to their pre-fracture activities of daily living (ADL) levels one year after fragility hip fractures. Pre-fracture Barthel index, EQ-VAS scores and type of treatment were significant predictors for differentiation of patients with the ability to recover pre-fracture ADL and were incorporated into the prediction model. The model showed excellent discriminative ability [AuROC of 0.86 (95%CI 0.82 to 0.91)] and good calibration.
Conclusion: The prediction model allows the clinicians to predict the patients' ability to recover after one year of fragility hip fracture individually. In addition, it can guide counseling and decision making for aggressive strategies to improve rate of functional recovery after fragility hip fractures during post-treatment period. The web application (Fig. 1) is available at www.calconic.com/calculator-widgets/hip-fracture-functional-recovery-prediction-tool/64903a84b4cd1f001eb92003?layouts=true.



P959
PROGNOSTIC FACTORS FOR FUNCTIONAL RECOVERY AT ONE YEAR FOLLOWING FRAGILITY HIP FRACTURES

N. Kitcharanant[1], P. Atthakomol[1], J. Khorana[1], P. Phinyo[1], A. Unnanuntana[1]

[1]Chiang Mai Univ., Chiang Mai, Thailand

Objective: The main objective of treating fragility hip fractures is to maximize the patients' ability to return to their basic activities of daily living (ADL) levels. This study explored prognostic factors associated with the ability to recover pre-fracture ADL levels one year after fragility hip fractures.
Methods: We retrospectively recruited patients admitted with fragility hip fractures between July 2016 and September 2018. Details of the following were extracted from electronic medical records: age, sex, BMI; pre-fracture Charlson Comorbidity Index (CCI), Barthel index, and EuroQol-Visual Analog Scale (EQ-VAS) scores; pre-fracture ambulatory status; and fracture type and treatment. The primary endpoint was the ability to return to pre-fracture ADL status at one year. Multivariable logistic regression analysis assessed the prognostic ability of predictors.
Results: Of 405 patients, 284 (70.1%) managed to return to their pre-fracture ADL status. Multivariable logistic regression analysis demonstrated that the predictor with the most apparent effect size was pre-fracture EQ-VAS scores ≥ 65 (multivariable odds ratio [mOR] = 12.90; P = 0.03). Other influential predictors were CCI scores < 5 (mOR = 1.96; P = 0.01) and surgical treatment for the hip fracture.
Conclusion: Three prognostic factors can predict a hip fracture patient's ability to return to the pre-fracture ambulatory status at one year. They are the patient's CCI score, operative treatment for the hip fracture, and the pre-fracture EQ-VAS score. This information could be used to develop a clinical prediction model based on the prognostic factors.

P960
COLLATERAL EFFECTS OF THE COVID-19 PANDEMIC ON ENDOCRINE TREATMENTS FOR BREAST AND PROSTATE CANCER IN THE UK: IMPLICATIONS FOR BONE HEALTH

N. L. Barclay[1], M. Català[2], A. M. Jödicke[1], D. Prieto-Alhambra[1], D. Newby[1], A. Delmestri[1], W. Y. Man[1], A. Roselló Serrano[3], M. Pineda Moncusí[1], O. C. Optima Consortium[4]

[1]Nuffield Dept. of Orthopaedics, Rheumatology and Musculoskeletal Sciences (NDORMS), Univ. of Oxford, Oxford, UK, [2]Nuffield Dept. of Orthopaedics, Rheumatology and Musculoskeletal Sciences (NDORMS), Univ. of Oxford, Oxford, UK, [3]Institut Català d'Oncologia, Hospital Universitari Dr Josep Trueta, Girona, Spain, [4]Univ. of Aberdeen, Aberdeen, UK

Objective: The COVID-19 pandemic affected cancer screening, diagnosis and treatment pathways. This study examined the impact of the pandemic on incidence and trends of endocrine treatments in patients with breast or prostate cancer; and endocrine treatment-related side effects including osteopenia, osteoporosis and bisphosphonate prescriptions.
Methods: Population-based cohort study using UK primary care Clinical Practice Research Datalink GOLD database. There were 13,701 newly diagnosed breast cancer patients and 12,221 prostate cancer patients with $\geq$ 1-y data availability since diagnosis between January 2017-June 2022. Incidence rates (IR) and incidence rate ratios (IRR) were calculated across multiple time periods before and

after lockdown to examine the impact of changing social restrictions on endocrine treatments and treatment-related outcomes.
Results: In breast cancer patients, aromatase inhibitor prescriptions increased during lockdown vs. pre-pandemic (IRR: 1.22 [95%CI: 1.11–1.34]), followed by a decrease post-first lockdown (IRR: 0.79 [95%CI: 0.69–0.89]). In prostate cancer patients, first-generation antiandrogen prescriptions increased vs. pre-pandemic (IRR: 1.23 [95%CI: 1.08–1.4]). For breast cancer patients on aromatase inhibitors, diagnoses of osteopenia, osteoporosis and bisphosphonate prescriptions were reduced across all lockdown periods vs. pre-pandemic (IRR range: 0.31–0.62).
Conclusion: During the first 2 y of the pandemic, newly diagnosed breast and prostate cancer patients were prescribed more endocrine treatments compared to pre-pandemic, due to restrictions on hospital procedures replacing surgeries with bridging therapies. But breast cancer patients had fewer diagnoses of osteopenia and osteoporosis, and bisphosphonate prescriptions. These patients should be followed up in the coming years for signs of bone thinning. Evidence of poorer management of treatment-related side-effects will help assess resource allocation for patients at high risk for bone-related complications.
Acknowledgement: This research was partially funded by the European Health Data and Evidence Network (EHDEN) (grant number 806968), the Optimal treatment for patients with solid tumours in Europe through Artificial Intelligence (OPTIMA) initiative (grant number 101034347), and the Oxford NIHR Biomedical Research Centre. OPTIMA is funded through the IMI2 Joint Undertaking and is listed under grant agreement No. 101034347. IMI2 receives support from the European Union's Horizon 2020 research and innovation programme and the European Federation of Pharmaceutical Industries and Associations (EFPIA). IMI supports collaborative research projects and builds networks of industrial and academic experts in order to boost pharmaceutical innovation in Europe. The views communicated within are those of OPTIMA. Neither the IMI nor the European Union, EFPIA, or any Associated Partners are responsible for any use that may be made of the information contained herein. The study funders had no role in the conceptualisation, design, data collection, analysis, interpretation of data, decision to publish, or preparation of the manuscript.
Disclosures:
DPA's research group has received research grants from the European Medicines Agency; the Innovative Medicines Initiative; Amgen, Chiesi, and UCB Biopharma; and consultancy or speaker fees from Astellas, Amgen, and UCB Biopharma. DPA receives funding from the UK National Institute for Health Research (NIHR) in the form of a senior research fellowship and the Oxford NIHR Biomedical Research Centre.

P961
AUTONOMIC DYSREFLEXIA EXACERBATES BONE LOSS AFTER SPINAL CORD INJURY IN RATS

N. L. Nan[1], G. C. Guoqing[2], H. X. Huayi[1]

[1]Dept. of Rehabilitation Medicine, Peking Univ. Third Hospital, [2]Dept. of Rehabilitation Medicine, Peking Univ. Third Hospital, Beijing, China

Objective: Rapid and extensive bone loss was found after spinal cord injury (SCI). Various mechanisms are involved in the progress of abnormal bone metabolism after spinal cord injury, including changes in mechanical stress, lack of sunshine exposure, etc. The possible influence of the changed sympathetic activity on bone structure after spinal cord injury still remains uncertain. This study aims to investigate the effect of autonomic dysreflexia (AD) on the bone metabolism after spinal cord injury.
Methods: 34 adult male Sprague Dawley rats were randomized to receive (A) SHAM surgery (T3 laminectomy), (B) SCI (T3 transection), or (C) SCI + AD (T3 transection + AD induction). systolic blood pressure (SBP) and heart rate were recorded every week. μCT analysis, TRAP staining and detection of NE, OCN, CTX-I, RANKL/OPG were performed at 6 weeks.
Results: At 6 weeks post injury, SBP and NE expression were significantly increased in SCI + AD group compared with SHAM group and SCI group. μCT scanning showed that the volume of cancellous bone and the thickness of trabecular bone in fourth lumbar vertebral body and proximal femur of SCI + AD rats significantly decreased compared to SCI group. HE staining showed that bone mass significantly decreased in SCI + AD group compared with SCI group. TRAP staining showed increased number of osteoclasts ($p = 0.0035$), CTX-I activity in peripheral blood was significantly increased in the SCI + AD group ($p = 0.0046$), while RANKL expression was found significantly increased in distal femur and lumbar vertebrae after SCI, and further increase in SCI + AD group at distal femur.
Conclusion: Abnormal sympathetic activity plays an important role in bone remodeling after SCI. Increased sympathetic activity related to autonomic dysreflexia may exacerbate bone resorption, leading to extensive bone loss and development of osteoporosis.

P962
ASSOCIATION BETWEEN SINGLE-POINT INSULIN SENSITIVITY ESTIMATOR AND LOW BONE MINERAL DENSITY IN ARAB ADULTS

N. M. Al-Daghri[1], K. Wani[1], M. N. K. Khattak[1], A. M. Alnaami[1], Y. Al-Saleh[2], S. Sabico[1]

[1]King Saud Univ., [2]Dr Mohammad Alfagih Hospital, Riyadh, Saudi Arabia

Objective: The present observational study investigated the association between BMD and insulin sensitivity in a total of 1270 Arab adults (mean age 56.7 ± 8.1 y) with one or more risks associated with bone loss.
Methods: Lumbar BMD scan was performed using DXA. T-Scores and an index for insulin sensitivity called Single Point Insulin Sensitivity Estimator (SPISE) were calculated.
Results: The average SPISE values were significantly higher among those with low BMD (T-Score < -1.0) (4.6 ± 1.3 vs. 4.3 ± 1.2, $p < 0.001$) and a significant inverse correlation ($r = -0.21$, $p < 0.001$) was found between SPISE index and T-score. A multivariate linear regression analysis revealed that this inverse association was significant only in participants having hyperglycemia (> 7 mmol/l) alone (adjusted $\beta = -0.29$, $p < 0.001$) and ones with hyperglycemia and low BMD (adjusted $\beta = -0.11$, $p = 0.03$) suggesting that this association is largely influenced by hyperglycemia status.
Conclusion: The findings maybe clinically useful in assessing the bone health of T2DM patients in areas where healthcare resources are scarce (e.g., no DXA) since SPISE is inversely associated with BMD independent of age and status of menopause and that it can be calculated in the absence of known glycemic parameters.

P963
POSITIVE ASSOCIATION BETWEEN SERUM ALKALINE PHOSPHATASE AND HBA1C IN SAUDI CHILDREN

N. M. Al-Daghri[1], S. D. Hussain[1], S. Yakout[1], N. Aljohani[2], S. Sabico[1]

[1]King Saud Univ., [2]King Fahad Medical City, Riyadh, Saudi Arabia

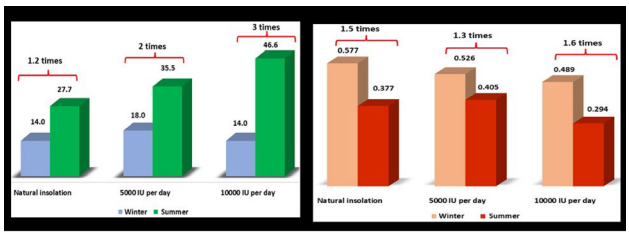
Objective: Previous studies have linked serum alkaline phosphatase levels and the risk of diabetes, but reported controversial results in adult population. It has also been reported that serum alkaline phosphatase has increased activity in growing children. Therefore, this study aims to observe association between serum alkaline phosphatase and HbA1c.
Methods: This cross-sectional study was performed between September 2019 and March 2021. Adolescents aged 12–17 y from 60 different secondary and preparatory year schools in Riyadh, Saudi Arabia were included.
Results: A total of 2666 adolescents participated in this study with mean age of 14.9 ± 1.7. There were 1601 girls and 1065 boys. The overall prevalence of diabetes was 4.6% (n = 122/2666) and was higher in boys than girls but no significance was observed (5.3 vs. 4.1%, p = 0.169). Preliminary analysis showed that there is a significant positive association between alkaline phosphatase (ALP) and HbA1c in adolescent with correlation coefficient of 0.10 ($P < 0.001$). Furthermore, similar positive association was also observed with bone specific alkaline phosphatase (BLP) and HbA1c with correlation coefficient of 0.12 (P = 0.020). Furthermore, median ALP concentration, i.e., 78.2 (55.0 – 108.5) was higher in in diabetic children as compared to non-diabetic children with median ALP concentration of 63.0 (42.6–93.0) ($p < 0.001$).
Conclusion: There is a positive association between ALP and HbA1c in children aged 12–17 y. Poor blood glucose control can cause a negative impact on bone mass acquisition at an early age, as these children and adolescents are developing height, along with the progression of diabetes. Diabetes during pubertal growth will foster a deficiency in bone mass gain, thus achieving a bone mass peak smaller than that of healthy individuals.

P964
INDICATORS OF MINERAL BONE METABOLISM DEPENDING ON THE DOSE OF VITAMIN D IN WOMEN OVER 50 YEARS OF AGE

L. S. Abboskhujaeva[1], N. M. Alikhanova[2]

[1]Republican Specialized Scientific and Practical Center of Endocrinology acad. Ya.Kh. Turakulov, [2]Institute of Health and Strategic Development, Tashkent, Uzbekistan

Objective: The problem of vitamin D deficiency in women persists even during periods of maximum insolation, which makes it necessary to specifically study various markers in order to develop preventive and treatment programs in this direction. The aim of this study was to estimate the level of markers of mineral bone metabolism during the period of maximum insolation and the dose of vitamin D.
Methods: 123 women were divided into 3 groups: 1) group with natural synthesis of vitamin D, depending on the degree of insolation (n = 73); 2) group with minimal vitamin D supplementation, < 5000 IU/d (n = 37); 3) group with vitamin D supplementation, > 10,000 IU/d (n = 13).
Results: A comparative analysis showed that vitamin D levels in the 3 compared groups both after the summer period and after taking supplements in two modes increased significantly ($p < 0.05$). The average vitamin D values were 27.7; 35.6 and 46.6 ng/ml. As the level of vitamin D increased, alkaline phosphatase levels also increased significantly ($p < 0.05$) in the 3 compared groups by 1.2, 1.3 and 1.5 times. At the same time, PTH levels had a multidirectional trend, but within the reference range, and the changes in values were not significant. Indicators reflecting bone tissue resorption (β-CrossLaps) in all groups decreased by 1.5, 1.3 and 1.6 times, respectively, indicating a decrease in bone resorption.



Vitamin D levels (a) and β-Cross Laps (b) in the three compared groups.

Conclusion: Changes in mineral bone metabolism indicators indicate a decrease in resorption and an increase in bone tissue formation. Changes in indicators in one direction or another in all groups occurred within the reference values, and a period of low insolation cannot provoke any pathological changes in the body. And perhaps taking large doses of vitamin D supplements does not make sense and does not provide additional benefits to the body. Although such conclusions require longer and more in-depth studies.

P965
EFFECTS OF QUERCITIN ON STRENGTH FEATURES OF THE HUMERUS IN RATS OF DIFFERENT AGES AFTER SURGICAL PERFORATION OF THE TIBIA

N. Mosyagina[1], V. Luzin[1], O. Bugakova[1], D. Lebed[1]

[1]FSBEI HI St. Luka LSMU of MOH of Russia, Lugansk, Russia

Objective: To test strength of the humerus in rats of different ages after fracture (FR) of the tibia.
Methods: Rats (n = 252) were distributed into 3 groups. Group 1 – intact animals. In the 2nd group, animals with through defect of both tibiae at the border of the proximal metaphysis and diaphysis with a diameter of 2 mm. Group 3 received quercetin daily via oral gavage in dosage of 3 g per kg of body weight. Observation terms were 7, 15, 30, and 90 d. The humerus was tested in bending at a loading rate of 0.25 mm/min until destruction. Fracture energy, breaking point, elasticity modulus, and specific sag were calculated.
Results: In animals of the group 2 with fracture of the tibia resulted in decrease in the strength of the humerus. Specific sag on the 7th day decreased by 18.26% as compared to the group 1, and on the 15th and 30th days it was 8.07% and 16.03% higher. Minimum fracture energy values during all observation periods were 18.84%, 19.46%, 16.64% and 8.65% lower than those of the intact animals. In rats of the group 3 intragastric administration of quercetin reduced negative effects of the experimental conditions. Minimum fracture energy was 12.31%, 10.18% and 11.20% less than the first group from 7 to 30 d. Breaking point changed more significantly: it varied from the 7th to the 30th day by 12.23%, 13.33% and 9.19% below the values of the first group. Elasticity modulus by the 30th day of the experiment was 10.04% less than that of the first group.
Conclusion: Use of Quercetin in animals can significantly reduce negative changes of the strength of the humerus evidenced by decreased amplitude of deviations of the studied parameters and reduced alterations.

P966
BONE GROWTH AND FORMATION IN RATS BORN FROM RATS TREATED WITH INSULIN

O. Skriabina[1], N. Mosyagina[2], L. Sankova[3]

[1]Lugansk State Medical Univ., Rivne, [2]Lugansk State Medical Univ., Lugansk, [3]Kyiv Medical Univ., Kyiv, Ukraine

Objective: To test bone growth and formation in rats born from rats treated with insulin.
Methods: Female rats (n = 60) were separated into two groups. Group 1 comprised intact animals which were injected subcutaneously with water equal to insulin volume. Group 2 was injected with insulin-long subcutaneously at a dose of 3 IU/kg. 30 d after the beginning of insulin administration, males were temporarily placed to females' cages. Mating was performed in the presence of estrus signs in vaginal smears, for 4 h in the morning. Newborn rats were euthanized immediately after delivery, their bodies were fixed and further sectioned using conventional technique. Sections were stained with alizarin to determine ossification points for area measurements.
Results: In 2nd group length of the ossification nuclei of the tibial, radial, humerus and pubic bones increased by 3.66%, 3.65%, 4.17%, and 3.36% respectively, as compared with the control values. During the examination of the area of ossification nuclei in the primordia of both tubular and spongy bones, it was found that their values were lower than those of controls: in the tibia by 4.75%, in the femur by 0.49%, in the radius by 0.36%, in the ulna by 1.69%, in the humerus by 3.69%, in the pubic bone by 7.38%, in the scapula by 0.60% and in the clavicle by 1.07%.
Conclusion: An increase of the ossification nuclei length and a decrease in their width in rats born from animals that received exogenous insulin may be the result of the fact that this hormone mainly plays the role of growth hormone in utero.

P967
ASSOCIATION OF DIETARY AND URINARY SODIUM WITH BONE MINERAL DENSITY AND THE RISK FOR OSTEOPOROSIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

N. Namazi[1], L. Azadbakht[2], S. Fatahi[3]

[1]Endocrinology and Metabolism Research Institute, Tehran Univ. of Medical Sciences, [2]Tehran Univ. of Medical Sciences, [3]Beheshti Univ. of Medical Sciences, Tehran, Iran

Objective: Despite previous research on the link between dietary/urinary sodium and BMD, bone mass content (BMC), and the risk of osteoporosis (OS), there is still conflicting evidence. The purpose of the present study was to examine the associations between dietary/urinary sodium and BMD, BMC, and the risk of OS as a systematic review and meta-analysis.
Methods: A systematic search was conducted in PubMed/MEDLINE, SCOPUS, and Web of Science to identify relevant studies. Articles that included cross-sectional and cohort designs and reported odds ratios (ORs), correlations (r), or β coefficients for the association between dietary/urinary sodium and OS, BMD, or BMC were included. In the present study all eligible articles written in English language was considered.
Results: By pooling 11 effect sizes from a total of 39,065 individuals, it was found that higher sodium consumption significantly increased the risk of OS (OR = 1.20; 95%CI, 1.02–1.41; p = 0.026), although there was high heterogeneity among the studies (I2 = 68.0%; p = 0.001). Subgroup analyses revealed a significantly higher risk of OS in premenopausal women (OR = 1.31; 95%CI, 1.01–1.69; p = 0.036), participants with a mean age older than 50 y (OR = 1.15; 95%CI, 1.04–1.28; p = 0.005), the dietary sodium intake subgroup (OR = 1.45; 95%CI, 1.19–1.77; $p < 0.001$), and individuals with adjustment for energy (OR = 1.77; 95%CI, 1.38–2.27; $p < 0.001$). However, there was no significant association between urinary sodium and BMD, as indicated by the correlation coefficients (r = -0.46; 95%CI, -0.74 to -0.18; p = 0.02).
Conclusion: This study found a positive association between sodium intake and the risk of OS, while no significant association was observed with urinary sodium. Additionally, there was no significant correlation between sodium intake and BMD. Given the high heterogeneity, further studies are recommended in this regard.

P968
TREATMENT OF PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS WITHOUT GLUCOCORTICOIDS

N. Nikishina[1], A. Mesnyankina[1], E. Aseeva[1]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Achieving stable remission in patients with SLE. Cancellation of oral GC or the use of therapy without GC in patients with SLE.
Methods: 3 clinical cases. Two patients (N1, N2) had a combination of SLE with Sjogren's syndrome with predominantly musculoskeletal syndrome. In these patients, severe organ lesions (lupus nephritis, vasculitis, central nervous system damage) were excluded. SLEDAI-2 K in these patients was 9 and 8 points. Both patients had a decrease in C3, C4 complement component, ANA positivity, arthritis, hematological disorders. In N2, an increase in at to ds-DNA was determined. Therapy with oral GC, immunosuppressive drugs was not carried out in them. Patient N3 with lupus nephritis (hematuria, leukocyturia), exudative pleurisy, polyarthritis, high immunological activity (SLEDAI-2 K—16 points) was prescribed GC at a dose of 2 tab per day. Creatinine and urea were within normal limits. The patient had high immunological activity: low C3, C4 complement, at to dsDNA 200 IU/ml, ANA positivity (1:1280). Due to the presence of lupus nephritis, the patient received mycophenolate mofetil 1500 mg/d. All patients received double anti-B-cell therapy with the sequential use of rituximab (RTX) 1000 mg intravenously in patients N1 and N2, and N3 at a dose of 2000 mg/d with premedication of 6-methylprednisolone at a dose of 250–500 mg intravenously. After 1–3 months, belimumab infusions were started at a dose of 10 mg/kg/month. The observation period is 1 y.
Results: Anti-B-cell therapy allowed patients to be treated without oral GC. A patient with LN (N3) was prescribed low doses of GC at the time of initiation of therapy with RTX, however, they were subsequently completely canceled by the 6th month of therapy. Clinical remission of the disease was achieved in all three patients. Clinical manifestations of the disease were stopped. SLEDAI-2 k was 0–2 points due to minor hypocomplementemia. No new irreversible organ damage and relapse of the disease were registered. Patients continued to receive monthly infusions of BLM, there were no repeated courses of RTM. The patient with kidney damage continued to take MM.
Conclusion: Consistent therapy of RTX and BLM allowed to achieve not only a high clinical and immunological effect, but also the possibility of reducing and even abandoning the oral dose of GC, which is consistent with the concept of "Treat to target" in SLE. In addition, all patients were closely monitored by a rheumatologist once a month, which was partly achieved thanks to monthly infusions of BLM, which were carried out in the clinic.
1. The abolition of GC in patients with SLE is a very real and achievable goal of therapy, as well as treatment without GC.

2. Discussion and application of only GIBP therapy without the use of GC is possible with certain subtypes of SLE without damage to vital organs.

3. The decision to reduce the dose of GC to the minimum with the subsequent cancellation or complete rejection of the use of GC therapy should be made by an experienced rheumatologist.

P969
LONG-TERM DATA ON RITUXIMAB AND BELIMUMAB THERAPY IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

N. Nikishina[1], A. Mesnyankina[1], E. Aseeva[1]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To evaluate the effectiveness of combination therapy with rituximab (RTM) and belimumab (BLM) in patients with SLE with long-term follow-up.

Methods: 12 patients with SLE (1 M/11F) of high and moderate disease activity, 9 of them with skin-joint manifestations, others had kidney damage, peripheral nervous system, vasculitis. Patients received RTM at a dose of 500–2000 mg with premedication of 6-methylprednisolone, and then BLM was prescribed according to the standard scheme of 10 mg/kg once a month. The patients were divided into two groups depending on the time of evaluation of long-term results. In the first group, data were analyzed 7–9 y after the initiation of RTM (4 people). In the second group of 8 patients after 2–4 y. The efficacy and tolerability of therapy, the activity of SLE, as well as the dose of oral glucocorticoids (GK) were evaluated.

Results: Against the background of combination therapy, a clinical and immunological response was obtained in 11 out of 12 patients one year later (initially, the Me of SLEDAI-2 K was 10 [9.5;14.5] points, 6 and 12 months after the initiation of BLM, Me was 4 [2;6] points, $p < 0.008$). Patients who started receiving RTM + BLM within 0–2 y from the moment of the debut of SLE responded better to therapy, and a more significant improvement in clinical and laboratory parameters was achieved. Subsequently, BLM therapy was limited, on average, to two years with the achievement of stable remission. This therapy allowed the use of medium and low doses of GK as an initiating therapy for exacerbation of SLE, followed by their decrease in dynamics. Clinical remission was achieved and persists in 7 patients, in three exacerbations were observed at different times after the withdrawal of BLM, the effect eluded in one patient, and another had no effect on combination therapy.

Conclusion: the achievement of the most pronounced positive result can be assumed in patients for whom RTM + BLM therapy is initiated as early as possible from the moment of diagnosis (0–2 y). BLM infusions should preferably be carried out according to the recommendations once a month, without long breaks between injections for at least 2 y, and, if possible, continue for a long time until a lasting effect is achieved. The use of low doses of GK and their elimination is a very real and achievable goal, however, careful monitoring of patients is required in order to identify early symptoms of exacerbation.

P970
ROLE OF REPEAT KIDNEY BIOPSY IN LUPUS NEPHRITIS

N. Nikishina[1], A. Mesnyankina[1], E. Aseeva[1]

[1]V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To demonstrate the clinical value of kidney biopsy for patients with lupus nephritis in order to select personalized therapy.

Methods: Patient K., 30 years old, has been observed at to the clinic with a definite diagnosis of SLE (according to SLICC ACR 2012 criteria) since 2012, the onset of the disease began with articular, skin syndrome, and leukopenia. The examination revealed immunological disorders: anti-DNA, ANF, antibodies to Sm, treatment was carried out with hydroxychloroquine 400 mg/d – 200 mg/d, glucocorticosteroids (GCS) at a dose of 16 mg/d, with a decrease to 4 mg/d and complete cancellation in 2019 due to clinical and laboratory remission of the disease. Deterioration of the condition on 12.2020—arthritis of the joints of the hands and feet, development of lupus nephritis. 02.2021—hospitalization at the clinic, during the examination an increase in AT to dsDNA, ANF, RNP-70, aCL, aBeta-2-GP-1, a decrease in C3, C4, a decrease in leukocytes, leukocyturia, erythrocyturia, daily proteinuria 0.8 g/d was noticed. A kidney biopsy with immunofluorescence revealed diffuse proliferative glomerulonephritis with 11% segmental fibrocellular crescents. Activity index-5. Chronicity index-1. Taking into account the young age, high activity of the disease (SLADAI 2 K = 20b.), rapid progression of the disease, the development of the patient's life-threatening condition caused by kidney damage (class IV lupus nephritis), during hospitalization pulse therapy was performed by 6 methylprednisolone (total dose 4 g) therapy was initiated by rituximab and mycophenolate mofetil 2000 mg/d, the dose of oral corticosteroids was increased to 25 mg/d, hydroxychloroquine was increased to 400 mg/d, anticoagulant therapy was initiated. The patient received an infusion of Rituximab every 6 months (total dose of 4000 mg), the dose of oral corticosteroids was reduced to 5 mg/d, and the intake of mycophenolate mofetil and hydroxychloroquine was extended. As a result of the therapy, it was possible to stop the manifestations of lupus nephritis and the immunological activity of the disease, and remission was achieved (SLEDAI 2 K-0). After 24 months, to resolve the issue of the need to continue immunosuppressive therapy, a repeat nephrobiopsy was performed (without complications), as a result, mesangioproliferative glomerulonephritis (class II) was detected. Activity index-0. chronicity index-0. Due to the morphologically confirmed absence of active VL, a decision was made to discontinue the pharmacological therapy and reduce mycophenolate mofetil and corticosteroids.

Results: Since there are no markers that reliably reflect the histopathology of the kidneys in SLE, a repeat kidney biopsy makes it possible to assess the activity of LN, the initial phase of immunosuppressive therapy, and to make decisions about its further correction.

Conclusion: Kidney biopsy remains the gold standard for establishing the diagnosis of LN and guiding clinical management. It allows for differential diagnosis in clinically complex cases, selecting adequate therapy based on the morphological form of kidney damage and avoiding the unreasonable prescription of glucocorticosteroids and cytostatics.

P971
DETERMINANTS OF QUALITY OF LIFE IN THE ELDERLY WITH OSTEOPOROSIS: BUSHEHR ELDERLY HEALTH PROGRAM (BEHP)

N. Panahi[1], N. Fahimfar[2], A. Sedokani[1], M. Hosseinpour[2], Y. Zarinfar[1], K. Khalagi[2], M. Sanjari[2], M. J. Mansourzadeh[2], M. R. Mohajer Tehrani[3], I. Nabipour[4], B. Larijani[3], A. Ostovar[2]

[1]Metabolic Disorders Research Center, Endocrinology and Metabolism Molecular-Cellular Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [2]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [3]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences

Institute, Tehran Univ. of Medical Sciences, Tehran, [4]The Persian Gulf Marine Biotechnology Research Center, The Persian Gulf Biomedical Sciences Research Institute, Bushehr Univ. of Medical Sciences, Bushehr, Iran

Objective: To evaluate the determinants of quality of life (QOL) in elderly individuals with osteoporosis, given the growing aging population and the increased prevalence of this condition.
Methods: The study was conducted using the cross-sectional data of the BEH program, phase 2. QOL was assessed using the SF-12 Questionnaire. Individuals with osteoporosis based on the WHO diagnostic criteria were enrolled. The physical (PCS) and mental (MCS) component summaries of QOL were estimated. Statistical analysis was conducted via univariable linear regression model.
Results: A total of 997 individuals (73% female) with osteoporosis were enrolled in the study. Men exhibited higher PCS and MCS scores compared to women, with mean differences of 6.2 (95%CI: 5–7.4) and 3.6 (2.1–5.1) respectively. Various factors such as depression, fear of falling, recent falling, and cognitive impairment were significantly associated with lower PCS scores in both men and women with beta coefficients ranging from -2 to -10. On the other hand, physical activity was positively linked to PCS (β F:3, M:4). Diabetes, hypertension, glucocorticoid use in women, and fracture history in men were significantly associated with lower PCS scores. Depression and fear of falling in both sexes; cognitive impairment, rheumatoid arthritis, glucocorticoid use, and recent falling in women; and smoking in men were associated with lower MCS scores. (β F:-14, M:-11 for depression; and -2 to -6 for other variables).
Conclusion: Elderly women with osteoporosis had lower QOL scores compared to men. Depression and fear of falling were identified as crucial factors contributing to reduced PCS and MCS scores in both sexes, while physical activity was associated with higher PCS scores in both men and women.

P972
ASSOCIATION BETWEEN OSTEOPOROSIS AND QUALITY OF LIFE IN THE ELDERLY: BUSHEHR ELDERLY HEALTH PROGRAM (BEHP)

N. PANAHI[1], N. Fahimfar[2], M. Hosseinpour[2], A. Sedokani[1], M. Sanjari[2], K. Khalagi[2], M. J. Mansourzadeh[2], A. Farhadi[3], M. R. Mohajer Tehrani[4], I. Nabipour[5], B. Larijani[4], A. Ostovar[2]

[1]Metabolic Disorders Research Center, Endocrinology and Metabolism Molecular-Cellular Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [2]Osteoporosis Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [3]The Persian Gulf Tropical Medicine Research Center, The Persian Gulf Biomedical Sciences Research Institute, Bushehr Univ. of Medical Sciences, Bushehr, [4]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, [5]The Persian Gulf Marine Biotechnology Research Center, The Persian Gulf Biomedical Sciences Research Institute, Bushehr Univ. of Medical Sciences, Bushehr, Iran

Objective: Considering the ageing of the population and the increased prevalence of osteoporosis, this study aimed to evaluate the association between QOL and osteoporosis and the determining factors in the elderly population.
Methods: This study was conducted using the cross-sectional data of the second phase of the BEH program, a population based cohort. QoL was assessed using the SF-12 Questionnaire. Patients were classified as osteoporosis and non-osteoporosis based on the WHO diagnostic criteria. The physical (PCS) and mental (MCS) component summaries of QoL were estimated. Statistical analysis was conducted via univariable and multivariable linear regression models.
Results: Overall 2399 participants > 60 y including 997 individuals with osteoporosis (73% women), and 1402 without osteoporosis (37% women) were enrolled. QoL was lower in osteoporosis compared to non-osteoporosis individuals in both men and women. In multivariable regression analysis, stratified by sex, osteoporosis was significantly associated with PCS in women [β: -0.90 (-1.83, -0.02)] but not men. Other factors contributing significantly with PCS include age [β F: -0.22; M: -0.21], BMI [-0.25; -0.09)], depression [-6.11; -8.67], physical activity [1.63; 2.20], glucocorticoid use [-0.61; -1.31], and fear of falling [-3.06; -3.41] in women and men; diabetes [-1.04] in women; smoking [0.91], fracture history [-1.05], and recent falling [-2.32] in men. Depression (-13.44) and fear of falling (-2.5) were associated with lower MCS scores in both sexes.
Conclusion: Although, QoL scores were lower in elderly individuals with osteoporosis compared to those without, after adjusting for possible confounders the association was significant only for PCS in women. Age, BMI, depression, physical activity, and fear of falling are among identifying factors associated with QoL in the elderly.

P973
BRIEF, LOW-IMPACT, HIGH-INTENSITY OSTEOGENIC LOADING TRAINING WITH OSTEOSTRONG DEVICES WITH ONCE-A-WEEK, 10-MIN EXERCISES FOR AT LEAST 12 MONTHS, IMPROVES BONE MINERAL DENSITY AND TRABECULAR BONE SCORE IN WOMEN WITH OSTEOPOROSIS OF THE LUMBAR SPINE

N. Papadopoulou-Marketou[1], A. Papageorgiou[2], G. Vavetsis[2], P. Tsiamyrtzis[3], N. Marketos[4], G. Chrousos[2]

[1]Neuroendocrine Tumor Unit, ENETS Centre of Excellence, 1st Dept. of Propaedeutic and Internal Medicine, Laiko General Hospital, National and Kapodistrian Univ. of Athens, Athens, Greece, [2]Univ. Research Institute of Maternal and Child Health and Precision Medicine, National and Kapodistrian Univ. of Athens, Athens, Greece, [3]Dept. of Mechanical Engineering, Politecnico di Milano, Milan, Italy, [4]Dept. of Physiology, Medical School, National and Kapodistrian Univ. of Athens, Athens, Greece, Athens, Greece

Objective: Osteoporosis is a chronic condition characterized by decreased bone density (BMD) and disrupted microarchitecture (TBS), associated with increased bone-fracture risk. Women with menopausal osteoporosis are usually treated with antiresorptive medication. "Osteostrong" is a bone-strengthening system that uses brief (10 min), weekly, low-impact, high-intensity osteogenic loading. We aimed to investigate the effectiveness of Osteostrong in women with osteoporosis of the lumbar spine.
Methods: 154 postmenopausal women with osteoporosis of the lumbar spine, followed at the Unit on Clinical and Translational Research in Endocrinology, University of Athens, Greece, were enrolled. They were divided into 2 groups. Group A included 75 women treated with Osteostrong (mean age: 58.8y, 95%CI 56.6–60.9); Group A was subdivided in GA1 that included women, who had no parallel antiresorptive treatment, and GA2, that included women who were treated in parallel with such medication. Group B included 79 women who had no Osteostrong intervention (mean age 61.5y, 95%CI 59.2–63.7). Group B was subdivided in GB1, that included women who received no anti-resorptive treatment, and GB2, that included women who were treated with such medication. All the participants had a complete physical examination, an assessment for exclusion of secondary osteoporosis, and a DXA examination [Horizon W(S/N 300472 M)], twice, at the time of inclusion in the trial and 12 months after. Statistical analysis performed using

freeware R(4.2.2) and examined during the period of study for significant mean differences in the recorded response variables.
Results: Paired Student t-test of BMD and TBS of the lumbar spine before and after Osteostrong intervention showed a significant improvement in both patients not receiving bone antiresorptive medication, and synergistically in those receiving such treatment in parallel. In patients receiving neither Osteostrong nor antiresorptive treatment there was a deterioration of BMD and TBS, while in those receiving medication there was a mild BMD and TBS improvement.
Conclusion: The study showed a significant improvement of BMD and TBS in the lumbar spine of women with osteoporosis treated with Osteostrong, regardless of parallel anti-resorptive treatment. Osteogenic loading has a synergistic effect with anti-osteoporotic medication, further improving bone strength and quality, leading to reduced bone fracture risk.

P974
COMPARATIVE STUDY OF SUBCHONDRAL BONE AND ARTICULAR CARTILAGE CHANGES IN MONOSODIUM IODOACETATE-INDUCED OSTEOARTHRITIS IN RAT AND RABBIT MODELS USING MICROCOMPUTED TOMOGRAPHY AND HISTOLOGY

N. S. Umran[1], S. Lau[1], N. Mohd[1], I. Madzuki[2], R. Yahya[3], M. Ajat[1]

[1]Universiti Putra Malaysia, Selangor, [2]Universiti Malaysia Perlis, Perlis, [3]Malaysia Nuclear Agency, Selangor, Malaysia

Osteoarthritis (OA), a degenerative joint disease, profoundly impacts the quality of life and imposes significant socioeconomic burdens. Animal models serve as valuable platforms for assessing the efficacy of drugs and nutraceuticals in clinical development. This study aims to evaluate and compare the progression and pathogenesis of OA in rat and rabbit models using the MIA-induced OA model. MIA-induced OA was induced in rat and rabbit models by intraarticular injection of 3 mg and 8 mg, respectively, at the right knee joint. At week 12, the subchondral cartilage and bone were harvested and evaluated through macroscopic observation, μCT imaging, and architectural, and histology analysis. The results of macroscopic observation, micro-architecture parameters, and histology showed that OA was more severe in the rat compared to the rabbit model. The rat exhibited progression to the bone remodeling stage, indicated by increased bone volume, trabecular thickening, and increased trabecular separation and porosity. The extensive and rapid pathological changes observed in the osteoarthritic joints of the rat model may limit the investigation of OA severity. This study demonstrates both similarities and differences between the two animal models, providing insights into individualized therapeutic approaches and the monitoring of disease progression and treatment strategies.

P975
EFFECTIVENESS OF DOUBLE BOILED EDIBLE BIRD NEST EXTRACT IN ALLEVIATING OSTEOARTHRITIS IN A RABBIT MODEL

N. S. Umran[1], S. Lau[1], N. Mohd[1], M. Ajat[1], I. Madzuki[2], S. Sulaiman[1]

[1]Universiti Putra Malaysia, Selangor, [2]Universiti Malaysia Perlis, Perlis, Malaysia

Osteoarthritis (OA) is associated with a high economic burden due to the effects of disability and the expense of treatment. To date there is no known cure for OA, the treatments include exercises, a weight loss program, support devices, pain relief medications, and surgical treatment. Generally, NSAIDs and analgesics are prescribed to OA patients to alleviate pain. These treatments have been proven effective in reducing symptomatic OA but the adverse effects of these current prescriptions have raised concern among consumers. Therefore, there is an urgent need in finding alternative nutripharmaceutical supplements for preventing OA. Edible bird's nest (EBN) is the salivary secretion originating from specific swiftlets, e.g., *Aerodramus fuciphagus* and *Aerodramus maximus* that have anti-catabolic, anti-inflammatory, and pro-anabolic activity on human osteoarthritic chondrocytes. 45 adult male New Zealand White Rabbits were divided into five groups; Group I: Sham (n = 9), Group II: Negative control, OA (n = 9), Group III: Positive control, OA + Diclofenac 3 mg/kg daily orally (n = 9), Group IV: OA + Double-boiled EBN Extract 75 mg/kg daily orally (n = 9), Group V: OA + Double-boiled EBN Extract 150 mg/kg daily orally (n = 9). Chemically induced OA was performed on all rabbits (n = 36) except the sham group by using 8 mg/knee joint of monosodium iodoacetate (MIA). 3 rabbits from each group were sacrificed at week 4, week 8, and week 12. Macroscopic, μCT, histology, and proteomic results showed that DBEBNE treatment has a chondroprotective effect in ameliorating OA. This study suggests that DBEBNE may have bone improvement, chondroprotective, antioxidant, and anti-inflammatory properties in ameliorating OA, based on results at the morphological as well as molecular level.

P976
RELATIONSHIP OF T2 RELAXATION TIME OF VARIOUS CARTILAGE LAYERS WITH THE LEVEL OF ADIPOKINES IN EARLY OSTEOARTHRITIS OF THE KNEE JOINTS

N. Savushkina[1], E. Taskina[1], N. Kashevarova[1], E. Strebkova[1], E. Sharapova[1], A. Khalmetova[1], D. Kudinskij[1], L. Alekseeva[1], A. Lila[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To determine the relationship of T2 relaxation time according to MRI with the level of adipokines in early osteoarthritis (OA) of the knee joints (KJ).
Methods: A prospective study included 82 women who met the ESKOA criteria being developed and currently being tested, with KJ OA and X-ray stage 0-II (Kellgren-Lawrence), who signed the informed consent. The average age of patients was 49.0 ± 10.2 y, the duration of the disease was 1 [0.5; 1] y. The average BMI values corresponded to overweight (26.6 ± 5.4 kg/m^2). The level of blood adipokines (visfatin, resistin, leptin) was studied in patients, and MRI with color mapping of cartilage tissue of targeted KJ was performed with calculation of T2 relaxation time. Statistical processing of the material was carried out using Statistica 10.0 software.
Results: The average level of visfatin was 33.8 ± 12.7 ng/ml, resistin—9.0 ± 3.1 ng/ml, leptin—24.8 ± 3.1 ng/ml; an increase in leptin levels was noted in 59.8% of cases, and visfatin levels—in absolutely all patients. The total MR T2 relaxation time of the cartilage of the targeted KJ was 36.0 [32.0;39.5] ms, the deep layer—36.4 [33.7;39.1] ms, the surface layer—37.0 [34.1;41.1] ms. The Spearman correlation analysis (Table 1) confirmed statistically significant positive relationships ($p < 0.05$) between the values of T2 relaxation time of cartilage in its individual layers and age, BMI, weight, cholesterol and leptin levels.

Table 1. Correlation coefficients between MR T2 cartilage relaxation time and various anthropometric and laboratory parameters

Parameter	MR T2 relaxation time of cartilage of the targeted knee joint	p
Total cartilage layer		
Age, years	0,44	<0,05
Weight, kg	0,41	<0,05
Leptin, ng/ml	0,40	<0,05
Cholesterol, mmol/l	0,44	<0,05
Deep layer		
Age, g	0,37	<0,05
BMI, kg/m^2	0,53	<0,05
Weight, kg	0,53	<0,05
Waist size, cm	0,49	<0,05
Hip volume, cm	0,43	<0,05
Leptin, ng/ml	0,50	<0,05
Cholesterol, mmol/l	0,45	<0,05
The surface layer		
Age, g	0,40	<0,05
Leptin, ng/ml	0,41	<0,05
Cholesterol, mmol/l	0,38	<0,05

Conclusion: Leptin, an increase in which occurs in most patients with early OA, is a promising diagnostic marker of the disease, since its increase significantly correlates with T2 relaxation time in all layers of cartilage.

P977
RELATIONSHIP OF PAIN LEVELS WITH LABORATORY PARAMETERS IN EARLY OSTEOARTHRITIS OF KNEE JOINTS

N. Savushkina[1], E. Taskina[1], N. Kashevarova[1], E. Strebkova[1], E. Sharapova[1], A. Khalmetova[1], L. Alekseeva[1], A. Lila[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To determine the relationship of pain levels with laboratory parameters in early osteoarthritis (OA) of the knee joints.
Methods: A prospective study for the period 2022–2023 included 82 women who met the ESKOA criteria being developed and currently being tested, with knee joint OA and X-ray stage 0-II (Kellgren-Lawrence), who signed the informed consent. The average age of patients was 49.0 ± 10.2 y (from 35–73), the duration of the disease was 1 [0.5; 1] y. An individual card was filled out for each patient, including anthropometric parameters, WOMAC indicators, concomitant diseases and therapy during the follow-up period. Statistical processing of the material was carried out using Statistica 10.0 software.
Results: Knee joint pain according to WOMAC reached 60 [20; 140] mm, stiffness—30 [10; 70] mm, functional insufficiency (FN)—145 [40; 390] mm, the total index of WOMAC—250 [80; 630] mm. The median markers associated with OA, inflammation, metabolic syndrome, and cartilage destruction were as follows: cholesterol—5.4 [4.83; 5.85] mmol/L, IL-1β—3.29 [1.15; 2.84] ng/ml, IL-10—0.02 [0.001; 32.5] ng/ml, IL-34—0,01 [0,001; 13,2] ng/ml, CTX-I—0.007 [0.002; 0.079] ng/ml. The Spearman correlation analysis (Table 1) revealed statistically significant positive relationships ($p < 0.05$) between various components of WOMAC and CTX-I levels, and negative ones with MMP3, IL-10 and IL-34. It was also demonstrated that an increase in MS components and hypercholesterolemia had significant negative correlations with the level of the anti-inflammatory cytokine IL-10, as well as the level of IL-34.

Table 1. Correlation coefficients between the components of WOMAC and metabolic syndrome and laboratory parameters in early knee OA

Parameter		p
Pain-WOMAC	IL-10	<0,05
	IL-34	<0,05
FN-WOMAC	CTX-I	<0,05
Stiffness-WOMAC	IL-10	<0,05
	IL-34	<0,05
Total WOMAC	CTX-I	<0,05
	IL-10	<0,05
The number of components of the metabolic syndrome	IL-10	<0,05
	IL-34	<0,05
Hypercholesterolemia	IL-34	<0,05

Conclusion: The CTX-1 subchondral bone remodeling marker increases as knee joint pain increases in early OA, which makes it possible to consider it as a possible marker of disease progression. Negative correlations between the level of pain and anti-inflammatory cytokines indicate a weakening of anabolic processes during the development of OA, which requires further study.

P978
OSTEOPOROSIS AND CEREBROVASCULAR EVENTS: A RETROSPECTIVE COHORT BONE DENSITY STUDY

N. Theerapakanunt[1], S. Jannoo[1], N. Kietsiriroje[1], P. Limumpornpetch[1], T. Ingviya[1], R. Leelawattana[1]

[1]Prince of Songkla Univ., Hatyai, Thailand

Objective: There is a link between low bone density and atherosclerosis, yet the impact of low bone mass on cardiovascular disease remains to be investigated. This study aims to explore the relationship between osteoporosis and major adverse cardiovascular events (MACE).
Methods: This retrospective cohort included participants aged 60–75 y during their initial BMD measurement from January 1, 2005 to December 31, 2021. Osteoporosis was defined by BMD T-scores at the lumbar spine or femoral neck ≤ -2.5 or when fragility fracture was evident. MACE included the composite of cardiovascular death, nonfatal myocardial infarction, or nonfatal stroke (3P-MACE) collected after the date of BMD to November 15, 2023. The Cox-proportional hazard model was employed to assess the hazard ratios (HR) of MACE, adjusted for potential confounders, with the osteoporotic status as a fixed factor. $P < 0.05$ was used to determine statistical significance.
Results: In total, 348 patients were included, with 329 (94.5%) being female, mean age 67.4 ± 4.2 y, and mean BMI 24.4 ± 4.8 kg/m^2. A total of 167/348 (48.0%) patients were diagnosed with osteoporosis at entry. The primary endpoint, 3P-MACE, occurred in 68/348 (27.4%) in both groups with HR 1.43 [95%CI: 0.89–2.32], p = 0.14 in the osteoporosis group. The rate of nonfatal stroke events was significantly higher in the osteoporosis group, 25/167 (25.0%) vs. 10/181 (5.5%) (HR 2.69 [95%CI: 1.29–5.61], p = 0.008) whereas nonfatal myocardial infarction events similarly occurred between the two groups 15/167 (9.0%) vs. 19/181 (10.5%) (p = 0.58). After adjusting for age, sex, and other risk factors, the risk of nonfatal stroke remains significantly higher (adjusted HR 3.09 [95%CI: 1.37–6.93], p = 0.006).

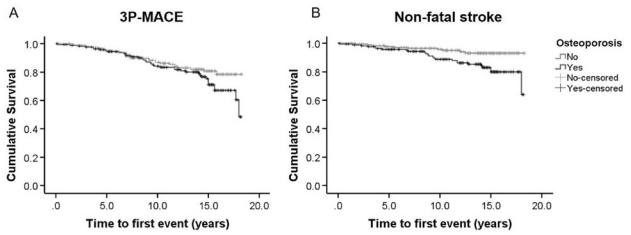


Figure 1 Time-to-First-Event Analysis for A) primary cardiovascular composite endpoint (death from cardiovascular causes, nonfatal myocardial infarction, or nonfatal stroke; 3P-MACE) and B) non-fatal stroke. The *black line* refers to the osteoporosis group (n=167) and the *grey line* refers to the non-osteoporosis group (n=181).

Conclusion: This study demonstrates the increased risk of nonfatal stroke in patients with osteoporosis. Yet, the relationship between osteoporosis and major cardiovascular events is inconclusive. A larger prospective study is warranted to further elucidate this link.

P979
IMPACT OF GLP-1 RECEPTOR AGONISTS AND SGLT-2 INHIBITORS ON BONE METABOLISM IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

N. Timkina[1], A. Simanenkova[1], M. Mart'Yanova[1], L. Karonova[1]

[1]Almazov National Medical Research Centre, St. Petersburg, Russia

Objective: Bone fracture risk increases in diabetes mellitus type 2 (DM2). The impact of certain glucose-lowering drugs on bone remodeling is not fully understood. This study aims to investigate bone metabolism in patients with DM2 undergoing treatment with SGLT-2i and GLP-1 RAs.

Methods: 94 DM2 patients (36 men, aged 45–75 y, with glycated hemoglobin (HbA1c) level 1–2.5% higher than the target) were receiving SGLT-2i (empagliflosin, dapagliflosin or canagliflosin, n = 55) or GLP-1 RAs (semaglutide, liraglutide, dulaglutide, n = 39) in addition to metformin for 12 months. Level of phosphorus (P, mmol/l), calcium (Ca, mmol/l), 25(OH)D, ng/ml, PTH (pg/ml), osteocalcin (OC, ng/ml), osteoprotegerin (OPG, pmol/l), RANKL (pmol/l), FGF23 (pmol/l) were measured at the start of treatment and after 12 months. 56 patient underwent DXA.

Results: The median age was 58 y (50.8; 58), and the median HbA1c was 7% (6.4; 8). Three patients (excluded from the study) had osteoporosis according to BMD measurements. 13 (24%) patients had osteopenia. 27 (50.9%) and 6 (11.3%) patients were diagnosed with degraded and partly degraded microarchitecture of bone tissue, respectively, according to the TBS. After 12 months, patients receiving SGLT-2 inhibitors showed an increase in FGF23 levels (from 1.05 (0.85; 1.31) to 1.23 (1.09; 1.41), p = 0.059), a decrease in hip BMD (from 1.14 g/cm^3 (1.04; 1.2) to 1.07 (1.01; 1.12), p = 0.035), and a decrease in neck hip BMD (from 1.02 g/cm^3 (0.94; 1.13) to 0.97 (0.9; 1), p = 0.042). In the GLP-1 RAs group, BMD, TBS, and bone markers remained stable. FGF23 correlated with HbA1c (ρ = 0.359, p = 0.001). RANKL correlated with age (ρ = -0.27, p = 0.02) and TBS (ρ = -0.35, p = 0.027). OC correlated with HbA1c (ρ = -0.26, p = 0.02), Ca (ρ = 0.344, p = 0.09), BMD L1-L4 (ρ = -0.374, p = 0.01), and BMD hip (ρ = -0.328, p = 0.06).

Conclusion: GLP-1 RAs have a neutral effect on bone metabolism. SGLT-2 inhibitors can impair BMD by increasing FGF23 and subsequently triggering the Ca-PTH axis.

P980
BONE MICROARCHITECTURE IN POSTMENOPAUSAL WOMEN WITH RHEUMATOID ARTHRITIS

M. Kozyreva[1], O. Dobrovolskaya[1], N. Demin[1], O. Nikitinskaya[1], N. Toroptsova[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To compare the microarchitecture of bone using TBS in postmenopausal women with rheumatoid arthritis (RA) and without rheumatic diseases.

Methods: 242 postmenopausal women were included: 198 patients with confirmed RA (mean age 58 $\pm$ 12.1 y) and 44 without rheumatic diseases (mean age 61.3 $\pm$ 8.4 y, p = 0.09). Clinical examination and DXA of the lumbar spine (L1-L4) and the proximal femur were conducted. Based on the measurement of BMD L1-L4 TBS was calculated using the TBS Insight software, version 3.0. The microarchitecture of bone tissue was ranked according to TBS: degraded—TBS $\leq$ 1.23, partially degraded—TBS > 1.23—< 1.31, normal bone microarchitecture—TBS $\geq$ 1.31.

Results: The determination of TBS values in women with RA revealed that 98 (49.5%) had a normal microarchitecture, 40 (20.2%) partially degraded, and 60 (30.3%) degraded microarchitecture. In the control group there were 22 (50%) women with normal TBS, 17 (38.6%) with moderate values of TBS and 5 (11.4%) with low TBS. Normal TBS levels were significantly more common in patients without RA (p = 0.009). Osteoporosis (OP) was found in 62 (31.3%) patients with RA and in 7 (15.9%) women of the control group, p < 0.05. OP was significantly more often diagnosed in L1–L4 compared with the proximal femur in both groups (p < 0.05). Among RA patients with OP in L1-L4, degraded bone microarchitecture was revealed in 28 (62.2%), partially degraded in 10 (22.2%), normal microarchitecture in 7 (15.6%) women, while in patients of the control group with OP in L1-L4—3 (42,9%), 2 (28,6%) and 2 (28.6%) persons, respectively, (p > 0.05). In RA patients with OP in femoral neck (FN) and/or total hip (TH), the degraded bone microarchitecture was determined in 9 (53%), partially degraded in 5 (29.4%), normal in 3 (17.6%) patients. In the control group—0 (0%), 1 (50%) and 1 (50%) person, respectively (p > 0.05).

Conclusion: The degraded microarchitecture of bone tissue by TBS was detected in 30.3% of postmenopausal women with RA and 11.4% of persons without rheumatic diseases. In individuals with OP, the frequency of low TBS did not differ between two groups.

P981
TRABECULAR BONE SCORE AND IMMUNOLOGICAL MARKERS IN RHEUMATOID ARTHRITIS PATIENTS

M. Kozyreva[1], O. Nikitinskaya[1], E. Samarkina[1], N. Toroptsova[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To determine the association between TBS and immunological markers in postmenopausal women with rheumatoid arthritis (RA).

Methods: 198 postmenopausal women with a confirmed diagnosis of RA according ACR/EULAR 2010 were included. All patients were surveyed using a specially designed questionnaire, X-ray osteodensitometry of the lumbar spine (L1-L4) was performed to assess BMD and TBS. The immunological study included the determination of rheumatoid factor (RF), antibodies to cyclic citrullated peptide

(ACCP), C-reactive protein (CRP) by nephelometric method on the Atellica® NEPH 630 system analyzer (Siemens Healthineers, Erlangen, Germany).
Results: The median age of the examined individuals was 58 ± 12.1 y, the postmenopausal period was 13.0 [5.0; 18.0] y and the duration of RA was 9.0 [3.0; 16.0] y. Low TBS was detected in 60 (30.3%), moderate in 40 (20.2%), and normal in 90 (39.5%) patients. RF seropositive were 149 (75.3%) women (median RF level 55.9 [10.6; 199.0] IU/ml). ACCP was determined in 188 patients, with 135 (68.2%) persons being positive (median level 58.15 [6.0; 228.6] IU/ml). Median CRP was 6.0 [1.6; 15.9] mg/l. Spearman's correlation analysis did not reveal a link between TBS and RF, ACCP, and CRP. When comparing patients with low and normal TBS, no significant differences were found: RF—55.9 [11.7; 259.0] IU/ml vs. 45.7 [10.0; 141.0] IU/ml, respectively; ACCP—59.5 [5.6; 263.6] IU/ml vs. 47.4 [5.8; 200.0] IU/ml, respectively; CRP—5.4 [1.4; 16.1] mg/l vs. 7.5 [1.7; 14.5] mg/l, respectively, $p > 0.05$.
Conclusion: Low TBS was detected in 30.3% of women with RA. No significant differences in the level of RF, ACCP and CRP were revealed between patients with degraded and normal bone microarchitecture.

P982
TRABECULAR BONE SCORE AND BIOCHEMICAL BLOOD PARAMETERS IN POSTMENOPAUSAL WOMEN WITH RHEUMATOID ARTHRITIS

M. Kozyreva[1], O. Dobrovolskaya[1], N. Demin[1], O. Nikitinskaya[1], N. Toroptsova[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To find out association between TBS and blood biochemical parameters in postmenopausal women with rheumatoid arthritis (RA).
Methods: 198 postmenopausal women with a confirmed diagnosis of RA were included (mean age 58 ± 12.1 y). The laboratory examination included a clinical blood test and a biochemical analysis (level of glucose, total cholesterol, uric acid, creatinine, total protein, albumin, alkaline phosphatase, calcium and phosphorus). Creatinine clearance was calculated using the Cockcroft-Gault formula. DXA of the lumbar spine (L1-L4) and the proximal femur was performed (Lunar Prodigy Advance, GE, USA). The L1-L4 TBS was determined using the TBS insight software, version 3.0. A correlation analysis using the Spearman method was performed.
Results: Median value of TBS was 1.31 [1.21; 1.38], while degraded bone microarchitecture (TBS ≤ 1.23) was detected in 60 (30.3%) people, partially degraded (TBS > 1.23—< 1.31) in 40 (20.2%), and normal (TBS ≥ 1.31) in 98 (49.5%) of persons. In individuals with degraded microarchitecture mean erythrocyte sedimentation rate (ESR) was 31.8 ± 22.3 mm/h and in patients with normal bone microarchitecture—16.9 ± 11.6 mm/h, $p < 0.001$. No differences were found in hemoglobin level, leukocyte formula, platelet count. There were also differences in glucose level (5.6 ± 1.3 vs. 5.2 ± 0.5 mmol/l, respectively, $p < 0.05$), uric acid (294.7 ± 69.0 vs. 236.2 ± 66.4 mmol/l, respectively, $p < 0.001$), total cholesterol (5.6 ± 0.8 vs. 5.0 ± 1.0 m/mol/l, respectively, $p = 0.01$), alkaline phosphatase (96.9 ± 42.9 vs. 76.7 ± 22.0 u/l, respectively, $p < 0.001$). Albumin level was significantly lower in patients with low TBS compared with those with normal TBS (38.7 ± 7.8 vs. 46.6 ± 3.8 g/l, respectively, $p < 0.05$). Patients with partially degraded bone microarchitecture did not differ from the other two groups in terms of clinical and biochemical blood parameters. Negative correlations have been established between TBS and uric acid ($r = -0.301$, $p < 0.05$), total cholesterol ($r = -0.235$, $p < 0.05$), alkaline phosphatase ($r = -0.247$, $p < 0.05$), phosphorus ($r = -0.307$, $p < 0.05$), as well as a positive with creatinine clearance ($r = 0.162$, $p < 0.05$).
Conclusion: 30.3% of patients with RA had degraded trabecular bone microarchitecture. TBS negatively correlated with the level of uric acid, total cholesterol, alkaline phosphatase and phosphorus, and positively with creatinine clearance.

P983
SARCOPENIA, OSTEOSARCOPENIA AND RISK OF FALLS AND FRACTURES IN PATIENTS WITH RHEUMATOID ARTHRITIS

O. Dobrovolskaya[1], N. Demin[1], A. Feklistov[1], N. Toroptsova[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To assess the risk of falls and fractures in women with rheumatoid arthritis (RA) with sarcopenia (SP) and osteosarcopenia (OSP).
Methods: The study included 102 women (mean age 58.1 ± 9.2 y), with RA (ACR/EULAR criteria, 2010), median disease duration was 8.0 [4.0; 15.0] y. The study was approved by the local ethics committee. The 10-y probability of a major osteoporotic fracture was assessed using the FRAX tool. DXA was performed to evaluate body composition and BMD of lumbar spine, femoral neck, total hip. Falls and low-energy fractures were registered during a 3-y prospective study. Univariant logistic regression was used to identify risk of falls and fractures.
Results:10 (9.8%) patients had SP and 13 (12.7%) OSP. According to FRAX, 42.9% of patients with SP and 92.3% with OSP had a high risk of fractures vs. 34.0% of women with normal body composition (NBC) had a high risk of fractures ($p < 0.001$). The frequency of falls during the year before the study in patients with SP was 40.0%, with OSP—61.5% and in women with NBC—22.4% ($p < 0.05$), during the prospective follow-up, the frequency of falls was 50.0%, 53.8% and 10.3%, respectively ($p < 0.001$). During the follow-up, 1 (1.0%) vertebral fracture and 4 (3.9%) peripheral fractures were registered. The frequency of fractures did not differ between the groups. Univariate logistic regression showed that SP and OSP increased the risk of falls compared with women with NBC (OR 9.3 (2.53–40.99), $p = 0.001$ and OR 13.25 (2.81–64.48), $p = 0.001$, respectively).
Conclusion: 22.5% of women with RA had SP or OSP, among them 52.2% had a high 10-y probability of fractures according to FRAX. OSP increased the risk of falls by 13 times; SP by 9 times in women with RA. We did not found relationship between the presence of SP/OSP and fractures. Further research is needed involving more people with SP/OSP.

P984
FACTORS ASSOCIATED WITH SARCOPENIA IN POSTMENOPAUSAL WOMEN WITH RHEUMATOID ARTHRITIS

N. Toroptsova[1], O. Dobrovolskaya[1], N. Demin[1], O. Nikitinskaya[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To evaluate the frequency of sarcopenia (SP) and factors associated with it in postmenopausal women with rheumatoid arthritis (RA).
Methods: 104 postmenopausal women (age 60.5 [51.1; 66.0] y) with confirmed RA (ACR/EULAR, 2010) were enrolled. Nutritional status was assessed using a MNA (Mini Nutricial Assessment)

questionnaire. All patients underwent handgrip strength by mechanical dynamometer for muscle strength determined. A laboratory examination and DXA were conducted. Osteoporosis (OP) was diagnosed according to WHO criteria, and SP was diagnosed according to the criteria EWGSOP2.

Results. SP was diagnosed in 33 (31.7%) women with RA. Persons with and without SP (SP + and SP- respectively) did not differ in age and RA duration ($p > 0.05$). Normal BMI was found in 72.7% SP + patients and in 28.2% SP- ($p < 0.001$). Women SP + had BMD lower than those SP- at any region. OP was diagnosed in 18 (54.5%) patients SP + and in 17 (23.9%) women SP- ($p = 0.002$). AMM correlated with BMI ($r = 0.61$, $p < 0.001$), BMD in the lumbar spine ($r = 0.32$, $p < 0.001$), BMD in the femur neck ($r = 0.53$, $p < 0.001$) and BMD in the total hip ($r = 0.44$, $p < 0.001$). Negative correlations were found with C-reactive protein ($r = -0.18$, $p = 0.036$). AMM was not correlated with age. In univariate logistic regression analyses SP was associated with BMI < 25 kg/m^2 (OR 8.13; 95%CI (3.30–20.01), $p < 0.001$), OP (OR 4.01; 95%CI 1.78–9.03, $p < 0.001$), and nutritional status by MNA < 24 points (OR 2.82; 95%CI (1.16–6.83), $p = 0.022$).

Conclusion: 1/3 of postmenopausal women with RA had confirmed SP. Factors associated with SP were BMI < 25 kg/m^2, presence of OP and reduce nutritional status.

P985
SARCOPENIC PHENOTYPE AND PHYSICAL PERFORMANCE IN RHEUMATOID ARTHRITIS PATIENTS WITH BIOLOGICAL THERAPY

O. Dobrovolskaya[1], N. Demin[1], A. Feklistov[1], M. Kozyreva[1], N. Toroptsova[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To evaluate appendicular lean mass, muscle strength and physical performance in rheumatoid arthritis (RA) women with biological therapy (BT).

Methods. The study included 63 women (mean age 60.3 ± 8.9 y) with confirmed RA treated with BT (BT +) and control group (117 age-matched RA patients who had never previously treated with BT). Clinical and laboratory examination, evaluation of body composition using DXA and tests to assess muscle strength and physical performance were carried out. The sarcopenic phenotype was diagnosed with an appendicular lean mass of < 15 kg or an appendicular lean mass index of < 5.5 kg/m^2.

Results: The frequency of sarcopenic phenotype among RA patients was 23.3%: in group BT + – 27.0%, in the control – 21.4% ($p > 0.05$). There were no differences among the groups based on the results of muscle strength assessment tests, however, patients BT + performed significantly better the short physical performance battery (SPPB) and had a higher gait speed ($p = 0.016$ and $p = 0.002$, respectively). Univariate linear regression analysis confirmed the relationship of the BT presence with the physical performance according to the results of SPPB ($b^* = 0.24$; $p = 0.018$) and gait speed ($b^* = 0.28$; $p = 0.006$).

Conclusion: The frequency of sarcopenic phenotype among patients with RA was 23.3% and was comparable in those who received BT and without it. There were no differences in muscle strength depending on the presence of BT, but the physical performance was significantly better in women BT + .

P986
BONE MINERAL DENSITY AND URIC ACID ASSOCIATION IN POSTMENOPAUSAL WOMEN

N. Toroptsova[1], O. Dobrovolskaya[1], N. Demin[1], E. Samarkina[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To assess the frequency of hyperuricemia (HU) and its association with MD) in postmenopausal women.

Methods. 263 postmenopausal women (median age 62 [56; 67] y) enrolled in the study. DXA to measure BMD of lumbar spine (LS), femoral neck (FN) and total hip (TH) was performed. All patients underwent laboratory examination to assess the level of uric acid (UA) in the blood serum (spectrophotometry; Cobas C311 analyzer). The level of MK > 360 μmol/l was taken as HU. The study was approved by the local ethics committee.

Results: Median UA level was 273.9 [220.0; 326.0] μmol/l, 33 (12.5%) women had HU. A cut-off point (200 mmol/l) was found using ROC analysis. In women with UA < 200 μmol/l BMD at any region was significantly less and the frequency of the osteoporosis was more than in those with UA > 200 μmol/l. We found correlation between BMD of LS and TH with UA ($p = 0.001$ and $p = 0.004$ respectively). In subgroup analyses according to age in women < 60 years old association among BMD of LS and UA was found ($p = 0.005$), in persons 60–70 years old BMD of FN and TH positively correlated with UA ($p = 0.004$ and $p = 0.002$ respectively). There were no significant correlations between BMD and UA in women > 70 years old. In the univariate linear regression associations between BMD and UA were confirmed. We didn't find any association between TBS, 10-y probability of fracture according to FRAX, frequency of previous low-energy fractures and UA.

Conclusion: The UA level < 200 μmol/l can be used as an additional risk factor of osteoporosis. Postmenopausal women with UA < 200 μmol/l. Postmenopausal women with UA < 200 μmol/l need to carry out DXA.

P987
ASSOCIATION OF BONE MINERAL DENSITY AND BIOCHEMICAL AND IMMUNOLOGICAL MARKERS IN WOMEN WITH RHEUMATOID ARTHRITIS

O. Dobrovolskaya[1], N. Demin[1], M. Kozyreva[1], E. Samarkina[1], M. Cherkasova[1], M. Diatroptov[1], N. Toroptsova[1]

[1]V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To study the associations of BMD with biochemical and immunological markers of blood serum in postmenopausal women with rheumatoid arthritis (RA).

Methods: 173 women with RA were examined (age 61.0 [56.0; 66.0] y). BMD was measured in all patients at lumbar spine (LS), femur neck (FN) and total hip (TH) by DXA. C-reactive protein (CRP), rheumatoid factor, anti-citrullinated protein antibodies (ACPA), PTH, IL-6, adiponectin and leptin were determined.

Results: The linear regression analysis revealed a significant association, independent of age, BMI and postmenopause duration, between BMD at any site and PTH ($\beta = -0.22$, $\beta = -0.35$ and $\beta = -0.30$, for LS, FN and TH, respectively), CRP ($\beta = -0.18$, $\beta = -0.23$ and $\beta = -0.22$, for LS, FN and TH, respectively) and leptin ($\beta = 0.35$, $\beta = 0.32$ and $\beta = 0.42$, for LS, FN and TH, respectively). Significant associations were also found between adiponectin and BMD in LS and TH ($\beta = -0.36$ and $\beta = -0.28$, respectively), ACPA and BMD in FN and TH ($\beta = -0.21$, $\beta = -0.24$, respectively) and IL6 and BMD in FN ($\beta = 0.37$).

Conclusion: CRP, ACPA, PTH, IL6, adiponectin and leptin were associated with BMD independently of age, BMI and duration of post menopause in women with RA.

P988
EFFECT OF PHYSICAL ACTIVITY ON FATIGUE IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

N. V. Aleksandrova[1], V. A. Aleksandrov[1], I. Y. Alekhina[2], R. A. Grekhov[3], A. V. Aleksandrov[3]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, [2]Stavropol State Medical Univ., the Dept. of Hospital Therapy, Stavropol, [3]Volgograd State Medical Univ., Volgograd, Russia

Objective: Severe fatigue is an important obstacle to physical activity in patients with systemic lupus erythematosus (SLE). We aimed to evaluate the effect of additional physical activity on reducing fatigue in outpatients with SLE.
Methods: 54 patients with SLE participated in the study. Fatigue was assessed using visual analog scale (VAS) and FACIT scale. The program of additional physical activity (during 4 weeks) included dosed walking (daily, duration of 30–60 min) taking into tolerability to physical activity according to the 6MWD-test. The level (total score) of kinesiophobia was determined by the Tampa Scale for Kinesiophobia (TSK) questionnaire.
Results: The mean level of fatigue on the VAS screening scale was 58.3 [24;73] points, and the mean level of kinesiophobia on the TSK was 34.8 $\pm$ 9.49 points. A positive correlation was noted between TSK and FACIT, FACIT and VAS scores. At the final stage of the study, according to the results of questionnaire processing, SLE patients were divided into two groups: I—dosed walking $>$ 5.5–6 thousand steps/d ($n = 31$), II—dosed walking $<$ 5.5 thousand steps/d ($n = 23$). Group I showed a decrease in walking time in the 50-m test ($p = 0.019$) and a decrease in fatigue according to VAS ($p = 0.026$) and FACIT ($p = 0.01$). In group II, there was an increase in kinesiophobia ($p = 0.025$) and an increase in FACIT fatigue ($p = 0.043$).
Conclusion: The severity of fatigue in patients with SLE depends on physical activity and the level of kinesiophobia. Motivating patients to overcome irrational fear of active movement may help to increase endurance and reduce the risk of depression.

P989
TOTAL JOINT ARTHROPLASTY AND ANTIRHEUMATIC MEDICATIONS IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS AND RHEUMATOID ARTHRITIS

N. V. Seredavkina[1], E. Y. Polischuk[1], V. N. Amirdjanova[1], M. A. Makarov[1], T. M. Reshetnyak[1]

[1]V.A. Nasonova Scientific Research Rheumatology Institute, Moscow, Russia

Objective: To evaluate the incidence of thrombohaemorrhagic and infectious complications of antirheumatic medications in patients with systemic lupus erythematosus (SLE) and rheumatoid arthritis (RA) undergoing total joint arthroplasty.
Methods: 34 patients (4 SLE and 30 RA) who underwent primary hip (11(32%)) and knee (23(68%)) arthroplasty were included. To prevent venous thromboembolic complications anticoagulants (ACs) were prescribed to all the patients 12 h after arthroplasty: nadroparin 0.3 ml/d for 7 d, then DOAC. Coagulogram and thrombodynamics tests were performed at 3 points: before arthroplasty, after arthroplasty before ACs and 7 d later the arthroplasty.
Results: Methylprednisolone and hydroxychloroquine were given to all SLE patients without cancellation. Methylprednisolone was given to 23(76%) RA patients and was cancelled preoperatively in 8(27%) patients. RA patients received the following antirheumatic medications (AMs): 21(70%) methotrexate, 4(13%) leflunomide, 1(3%) sulfasalazine and 3(10%) hydroxychloroquine. AMs were not cancelled in the perioperative period. 6(20%) RA patients were treated with biologics: 3 abatacept, 1 etanercept, 1 golimumab and 1 rituximab. In 1 patient, the abatacept administration coincided with arthroplasty and was delayed until the postoperative wound healed. None of the patients had early infections of the prosthetic joints. 2 RA patients developed vascular complications: 1 minor bleeding and 1 deep vein thrombosis. Before arthroplasty, thrombodynamics demonstrated normocoagulation in 58% patients and hypercoagulability in 42% patients. After arthroplasty, the frequency of hypercoagulability increased to 90%, and a state of thrombotic readiness was diagnosed in 8(33%) patients. Normocoagulation in all patients was achieved after use of nadroparin.
Conclusion: The use of antirheumatic medications and biologics in patients with SLE and RA did not increase the risk of prosthetic joint infection. Anticoagulant therapy in total joint arthroplasty in patients with SLE and RA was safe and effective in prevention of thromboembolic complications. Thrombodynamics allowed timely detection of the state of thrombotic readiness in patients with prosthetic joints.

P990
LRP5 MUTATION WITHOUT PSEUDOGLIOMA IN A YOUNG MAN WITH FRAGILITY FRACTURES

N. Vaghasia[1], A. Mithal[1], A. Dutta[1]

[1]Institute of Endocrinology and Diabetes, Max Healthcare, Saket, Delhi, New Delhi, India

Osteoporosis in children and young adults is relatively rare. Hereditary causes are often overlooked in the absence of a positive family history. We report a rare case of a 29-year-old male presenting with recurrent fragility fractures since the age of 6 y.
Case report: A 29-year-old male presented with an atraumatic painful spinal wedge compression. He reported a history of multiple childhood fractures (right humerus fracture at the age of 6 years, right fibula fracture at the age of 10 years and compression fracture of D12 at the age of 16 y). Secondary causes such as celiac disease, inflammatory disorders, hypogonadism etc. were ruled out. Family history was negative for any bone disease. Exome sequencing using Massively Parallel Sequencing (Next Generation Sequencing) was performed, which revealed two novel mutations in LRP gene—intron 5 c.1015 + 1G $>$ A and Exon 5 c.892C $>$ T. Although the former mutation has been described as a cause of osteoporosis in the homozygous state, it manifested as osteoporosis in our patient, in the heterozygous state, in presence of a second mutation on the LRP gene. Eye involvement, which is classically seen in "Osteoporosis-Pseudoglioma syndrome" homozygotes was absent in our patient. Genetic analysis of parents revealed that the father was a carrier of intron 5 c.1015 + 1G $>$ A and mother a carrier of Exon 5 c.892C $>$ T mutation. However, none of them had history of fractures or low bone density. The patient was subsequently treated with intravenous zoledronic acid (planned to be administered annually) and showed a significant improvement in bone density at spine and left femur with no further fractures over one year of follow up.
Conclusion: We report a novel presentation of a LRP5 mutation in a young male, which highlights the importance of genetic testing for primary osteoporosis in children and young adults.

P991
SARCOPENIC OBESITY AND HEALTH OUTCOMES: AN UMBRELLA REVIEW OF SYSTEMATIC REVIEWS WITH META-ANALYSIS

N. Veronese[1], F. S. Ragusa[1], F. Pegreffi[2], L. Dominguez[2], M. Barbagallo[1], M. Zanetti[3], E. Cereda[4]

[1]Univ. of Palermo, Palermo, [2]Univ. of Enna Kore, Enna, [3]Univ. of Trieste, Trieste, [4]IRCCS San Matteo, Pavia, Italy

Objective: Many studies supported that sarcopenic obesity (SO) could be considered as a potential risk factor for negative health outcomes. However, these results have been inconsistent and no umbrella reviews exist regarding this topic.
Methods: Several databases until November 2023 were searched for systematic reviews with meta-analysis of observational studies (cross-sectional, case–control and prospective). For each association, random-effects summary effect sizes, with correspondent 95%CIs were evaluated using the GRADE tool.
Results: Among 213 papers initially screened, nine systematic reviews with meta-analysis were included with a total of 384,710 participants. In any population addressed in cross-sectional and case–control studies, compared to non-SO, SO increased the prevalence of cognitive impairment (high certainty of evidence), coronary artery disease and dyslipidaemia (both moderate certainty of evidence). However, when compared to sarcopenia or obesity, the results were conflicting. In prospective studies, the association between SO—compared to non-SO—and other negative outcomes was supported by low/very low certainty of evidence and limited to a few conditions and no comparison with sarcopenia or obesity was provided. Finally, only few studies have used muscle function/physical performance in the diagnostic workup.
Conclusion: SO could be considered as risk factor only for a few conditions with a literature mainly based on cross-sectional and case–control studies. Future studies with clear definitions of SO are needed for quantifying the importance of SO—particularly when compared to the presence of only sarcopenia or obesity – and the weight of muscle function/physical performance in its definition.

P992
IMPACT OF LIFELONG EXERCISE ON CARDIOMETABOLIC HEALTH: A SYSTEMATIC REVIEW AND META-ANALYSIS

N. Veronese[1], M. I. Burgio[1], C. Mandalà[1], L. Dominguez[2], M. Barbagallo[1], L. Smith[3], L. Fontana[4], K. Prokipidis[5]

[1]Univ. of Palermo, Palermo, Italy, [2]Univ. of Enna Kore, Enna, Italy, [3]Anglia Ruskin Univ., Cambridge, UK, [4]Univ. of Syndey, Sydney, Australia, [5]Univ. of Liverpool, Liverpool, UK

Objective: The impact of lifelong exercise on cardiometabolic risk is a crucial aspect of public health. However, limited knowledge exists regarding differences in cardiometabolic parameters between older athletes, older controls, and sedentary/active young controls.
Methods: A comprehensive search in major databases until October 2023 was conducted for studies comparing older athletes with older controls or with both sedentary and active younger individuals. Mean differences (MDs) with 95%CIs were used for data reporting.
Results: From 25,910 screened studies, 61 studies including 75 cohorts were deemed of good quality, encompassing 1393 older athletes, 1369 older controls, 402 young sedentary controls, and 283 young active individuals. In comparison to older controls, older athletes exhibited significantly improved vascular parameters (systolic [MD = -5.04 mmHg] and diastolic [MD = -2.03 mmHg] blood pressure), cardiac (heart rate frequency [MD = -10.41 bpm]), and metabolic parameters (serum cholesterol profile). Conversely, when compared to young sedentary controls, older athletes displayed a less favorable blood pressure and metabolic (cholesterol, glucose) profile. Similar trends were observed when comparing older athletes to young active controls. Sensitivity and meta-regression analyses suggested that exercise lasting over 30 y might offer partial benefits for several markers of cholesterol and VO2max.
Conclusion: Lifelong exercise plays a crucial role in enhancing cardiometabolic parameters, although it may not fully replicate the metabolic and cardiovascular health observed in younger individuals.

P993
DEFERIPRONE ATTENUATES ESTROGEN DEFICIENCY-INDUCED OSTEOPOROSIS THROUGH PROMOTING COUPLING OF OSTEOGENESIS AND ANGIOGENESIS VIA INHIBITING FERROPTOSIS

N. Wang[1], F. Wang[1]

[1]Zhejiang Academy of Traditional Chinese Medicine, Hangzhou, China

Objective: Defective coupling of osteogenesis and angiogenesis is an important characteristic of postmenopausal osteoporosis. Increasing evidences and our previous work have proved that ferroptosis pathway was significantly activated in the development of postmenopausal osteoporosis[1]. Deferiprone (DFP) has been clinically used in treating transfusional iron overload in thalassemia patients. However, the effects and underlying mechanism of DFP on osteogenesis and angiogenesis coupling remain unclear. The present work aimed to test the hypothesis that DFP promotes coupling of osteogenesis and angiogenesis by suppressing ferroptosis, and exerts anti-osteoporosis effect under estrogen-deficient conditions.
Methods: The osteoporosis mouse model was established by bilateral ovariectomy (OVX) operation. We cultured iron overload-induced bone marrow mesenchymal stem cells (BMSCs) and endothelial cell (ECs) cell models.
Results: Estrogen deficiency led to a significant decrease of BMD and $CD31^{hi}endomucin^{hi}$ vessels in femurs in OVX-induced mice. Based on our data from BMSCs and ECs co-culture experiments, iron overload resulted in accumulated mitochondrial reactive oxygen species, furtherly increased lipid peroxidation deposition, ultimately led to ferroptosis. Iron overload also suppressed the secretion of slit guidance ligand 3 and vascular endothelial growth factor A, which are important factors in coupling of osteogenesis and angiogenesis. Importantly, DFP could reverse the lipid peroxidation, inhibit ferroptosis, improve osteogenesis and angiogenesis in the OVX-induced mice. In vitro results demonstrated that DFP suppressed ferroptosis in iron-overload-induced BMSCs and ECs models, and subsequently improved osteogenesis differentiation of BMSCs and tube formation ability of ECs.
Conclusion: Ferroptosis is one of key mechanisms of defective coupling of osteogenesis and angiogenesis in postmenopausal osteoporosis. We reveal that DFP promotes osteogenesis and angiogenesis coupling by inhibiting estrogen-deficiency-induced ferroptosis.
Reference: (1) Xu P, et al. Free Radic Biol Med 2022;193:720.
Acknowledgments: National Natural Science Foundation of China [82374012, 81973447]; Zhejiang Provincial Medicine Foundation [2022ZX002, GZY-ZJ-KJ-23006, GZY-ZJ-SY-2402].

P994
IMPROVING FRAGILITY FRACTURE CARE IN A NEW ZEALAND RURAL SETTING

N. Ward[1], E. Venecourt-Jackson[1], T. Wilson[1], D. Lee[1]

[1]Fracture Liaison Service Team, Whakatane Hospital, Hauora a Toi Bay of Plenty, Tauranga, New Zealand

Objective: Improving hip fracture bone protection medication use in a small rural hospital.
Methods: The Australian New Zealand Hip Fracture Registry (ANZHFR)[1] collects data on bone protection medication outcomes after hip fracture. Data for Whakatane hospital, a small rural hospital in the Eastern Bay of Plenty (EBOP) with a population of 56, 000 covering a large geographical area, with a significant proportion of our patients living in rural settings combined with a large Māori population (40%)[2], showed < 10% of patients were treated post hip fracture from 2017–2020. An orthogeriatric service started in August 2019 and a full complement of a Fracture Liaison Service (FLS) commenced in July 2021. We wanted to assess the impact of this service on the use of bone protection medication for hip fracture patients in the EBOP population.
Results: Prior to 2020, Whakatane hospital was achieving < 10% bone protection medication for hip fracture patients. Providing a geriatrician and FLS nurse one day per week and pharmacist half a day, the ANZHFR data for bone protection medication at 120 d shows Whakatane Hospital ranked No: 1 in New Zealand for both 2021 and 2022, with over 80% of their patients given bone protection medication.
Conclusion: Given the rural setting, both treatment and review in the community is a challenge due to accessibility and cost. The introduction of a hospital orthogeriatric service and FLS working together with dedicated follow up has significantly improved bone protection medication use for hip fracture patients and now has the ANZHFR bone protection medication at 120-day outcome as the best in New Zealand.
References:
1. Australian and New Zealand Hip Fracture Registry: New Zealand Hip Fracture Registry.
2. Place Summaries | Whakatane District | Stats NZ.

P995
INTEGRATING A FRAGILITY FRACTURE REGISTRY WITH AN FLS PATIENT MANAGEMENT SYSTEM: THE NEW ZEALAND EXPERIENCE

N. Ward[1], D. Mackenzie[2], F. Anderson[3], R. Harris[3], C. Gill[2], P. Mitchell[2], S. Stewart[4], D. Kim[5], K. Kim[2], A. Roddick[2]

[1]New Zealand arm of Australian and New Zealand Fragility Fracture Registry, Wellington, New Zealand, Tauranga, New Zealand, [2]Osteoporosis New Zealand, Wellington, Auckland, New Zealand, [3]New Zealand arm of Australian and New Zealand Fragility Fracture Registry, Wellington, New Zealand, [4]OperaIT Data Services, Logan, Queensland, Brisbane, Australia, [5]Diabetes and Endocrinology Services, North Shore Hospital, Te Whatu Ora Waitematā, Auckland, New Zealand

Objective: Implementing the nationwide rollout of the newly developed Australia & New Zealand Fragility Fracture Registry (ANZFFR) in New Zealand, which serves as both a data collection tool for measuring against clinical standards and a tailored Patient Management System (PMS) for Fracture Liaison Services (FLS).
Methods: The ANZFFR, designed as a PMS, integrates National Clinical Standards as Key Performance Indicators into a software application, encompassing patient information, diary management, and treatment guidance. FLS teams, including administrative staff, received training for day-to-day registry management upon securing ethics approval at each site. The continuously updated registry dashboards allow teams to assess their performance against national KPIs effortlessly. Substantial funding for FLS expansion was secured through negotiations between Osteoporosis New Zealand (ONZ) and the Accident Compensation Corporation of New Zealand (ACC), with the aim of enhancing national compliance with care standards. Extensive piloting with FLS teams refined functionality, leading to the registry going live in May 2022 after receiving national ethics approval in December 2021.
Results: By November 2023, 21 out of 22 FLS teams in New Zealand, covering 95% of the population, have adopted the ANZFFR as their PMS. Feedback from FLSs is overwhelmingly positive, with many regarding the PMS as a valuable labour-saving tool. As of 10 January 2024, 19,785 patients counts and 20,837 fragility fractures recorded.
Conclusion: The successful nationwide rollout of the ANZFR represents a significant achievement in advancing FLS in New Zealand. This success is indicative of the team's acknowledgment of the registry as an efficient patient management system, offering time savings, valuable real time service data, with a responsive and effective support system. With the first annual report released March 2024 (for July 2022-June 2023 data for 11,600 patients).

P996
TRENDS IN PREVALENCE OF HYPOVITAMINOSIS D OVER A 10-YEAR PERIOD IN JAPAN: RESEARCH ON OSTEOARTHRITIS/OSTEOPOROSIS AGAINST DISABILITY (ROAD) STUDY

N. Yoshimura[1], T. Iidaka[1], G. Tanegashima[1], S. Muraki[1], H. Oka[2], K. Nakamura[3], S. Tanaka[4]

[1]Dept. of Prev. Med. for Locomotive Organ Disorders, The Univ. of Tokyo, [2]Division of Musculoskeletal AI System Development, Faculty of Medicine, The Univ. of Tokyo, [3]Towa Hospital, [4]Dept. of Orthopaedic Surgery, Sensory and Motor System Medicine, Graduate School of Medicine, The Univ. of Tokyo, Tokyo, Japan

Objective: To clarify the trends in the prevalence of vitamin D insufficiency and deficiency among general inhabitants using population-based cohort data from the baseline and a survey conducted 10 y later.
Methods: The baseline survey of the Research on Osteoarthritis/Osteoporosis Against Disability (ROAD) study was conducted from 2005–2007. Blood examination was performed to measure serum 25-hydroxyvitamin D (25D) and intact PTH levels in 1683 participants (595 men, 1088 women). Participants completed an interviewer-administered questionnaire, underwent measurements of BMD, and had X-ray examinations. The fourth survey was conducted from 2015–2016; 1902 individuals (636 men, 1,266 women) completed assessments identical to those in the baseline survey. Vitamin D deficiency and insufficiency were defined by serum 25D levels < 20 ng/mL and ≥ 20 ng/mL but < 30 ng/mL, respectively.
Results: The mean levels of serum vitamin D were 23.3 ng/mL at baseline and 25.1 ng/mL in the fourth survey, respectively, which

increased significantly (baseline vs. 4th, $p < 0.0001$). The prevalence of vitamin D insufficiency at baseline and the 4th survey was 52.9% and 54.8%, respectively, and those of deficiency was 29.5% and 21.6%, respectively. The proportion of hypovitaminosis D decreased significantly over 10 years (baseline 82.5% vs. 4th 76.5%, $p < 0.001$). **Conclusion:** In the population-based survey with a 10-y interval, the prevalence of hypovitaminosis D decreased significantly. This favorable change could contribute to the decrease in the occurrence of osteoporosis and osteoporotic fractures in the future.

P997
EFFECT OF RADISH (*RAPHANUS SATIVUS*) DERIVED EXOSOMES ON OSTEOARTHRITIS

N. Ünsal[1], M. Y. C. Yıldırım Canpolat[1], O. E. Eren[1], B. K. Kabataş[1], F. Şahin[1]

[1]Yeditepe Univ., Biotechnology, İstanbul, Turkey

Osteoarthritis (OA), characterized by articular cartilage loss, is a well-established cause of impairment. Given the underlying pathology of OA, it is clear that injured cartilage has a low ability for regeneration. This means the proposed action is essential. Deterioration of articular cartilage, alterations in subchondral bone, and synovitis are hallmarks of this complex illness. Current OA treatments focus mostly on alleviating symptoms like pain and inflammation rather than stopping the disease itself from progressing. There is a significant knowledge gap when it comes to the mechanism that contribute to the OA development. Articular cartilage's extracellular matrix homeostasis is kept in check by a delicate balancing act between anabolic and catabolic pathways; abnormalities in this equilibrium are linked to OA. Chondrocytes are the special cells that make up cartilage in joints. Collagens, proteoglycans, and non-collagen proteins are all synthesized by these cells to form the extracellular matrix. Chondrocyte responses to molecular cues vary between areas and stages of illness, suggesting that mechanical stress and biochemical variables play major roles in disease development. In this regard, the utilization of plant-based products in the treatment of medical disorders is gradually becoming a preferred option due to the fewer negative effects associated with these items. In this respect, objective of this study to examine potential effects of *Raphanus sativus* derived exosomes on OA treatment by defining proliferative, anti-inflammation potential and upregulating cartilage specific activities on protein and gene expression levels for osteoarthritis. Our results demonstrated that, *Raphanus sativus* derived exosomes has anti-inflammation effect on OA while decreasing expression of IL-1β and IL-6 levels and inducing TGFβ. Also, these exosomes has proliferative effect on OA chondrocyte cells while promoting main extracellular matrix components. Based on these findings, *Raphanus sativus* derived exosomes appear as a potential therapeutic for OA treatment.

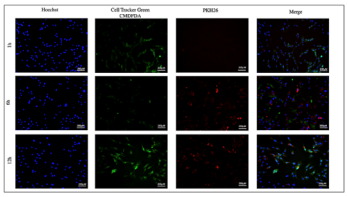


Figure 4. 3. Uptake images HC-OA cells with 100 µg/mL of *R. sativus* exosomes for 1st, 6th and 12th hour (20X magnification)

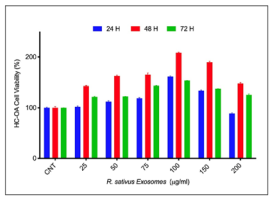


Figure 4. 2. Different doses of *R.sativus* exosomes between 25-200 µg/mL effects on HC-OA cells for 3 days and proliferation percentages compared to control group. The results are the mean standard deviation of three separate experiments.

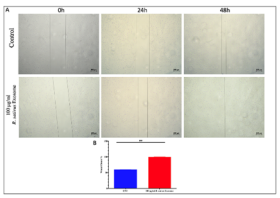


Figure 4. 5. (a) Images of scratch assay first 2 days under light microscope with 200 µm scale bar for control and 100 µg/ml radish exosome treated HC-OA cells. (b) Rate of closure HC-OA cells with radish exosome treated and untreated. Data are indicated with ± SD, *P < 0.05.

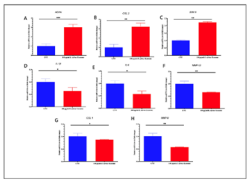


Figure 4. 6. Relative mRNA expression levels by fold change for HC-OA cells after 100 µg/ml of radish exosome treatment. (a) ACAN: Aggrecan, (b) Col 2: Collagen type II, (c) SOX-9: Transcription factor SOX-9, (d) IL1β: Interleukin 1-beta, e IL-6: Interleukin, (f) MMP13: Matrix metalloproteinase-13, (g) Col 1: Collagen type I (h) MMP9: Matrixmetalloproteinase-9, Multiple t tests with two-tails were used to analyze the results. Data are indicated with SEM, n=6, and *P0.05

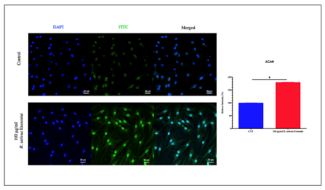


Figure 4. 11. ICC quantification and location of ACAN protein expression of HC-OA cells by confocal microscopy. All results were analyzed by two tailed multiple t tests. Data are shown with ± SD, n=3.

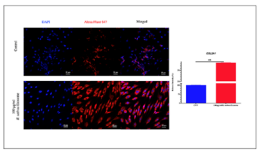


Figure 4. 12. ICC quantification and location of COL2A1 protein expression of HC-OA cells by confocal microscopy. All results were analyzed by two tailed multiple t tests. Data are shown with ± SD, n=3

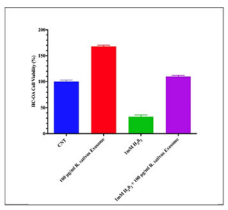


Figure 4. 4. Result of anti-inflammation effect of *R. sativus* exosomes (100 µg/mL) on HC-OA cell line by using 1mM of H_2O_2. The data shown is the average standard deviation from three separate studies.

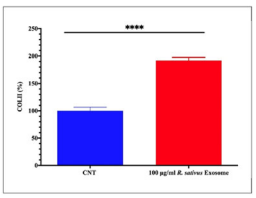


Figure 4. 7. Col II expression levels of HC-OA cells. Multiple t tests with two-tails were used to analyze the results. The data are shown with SEM, n=3, *P0.05 and **P0.01

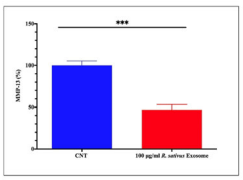


Figure 4. 8. MMP-13 expression levels of HC-OA cells. Multiple t tests with two-tails were used to analyze the results. The data are shown with SEM, n=3, *P0.05 and **P0.01

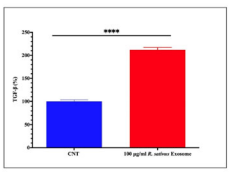


Figure 4. 9. TGF-β1 expression levels of HC-OA cells. Multiple t tests with two-tails were used to analyze the results. The data are shown with SEM, n=3, *P0.05 and **P0.01

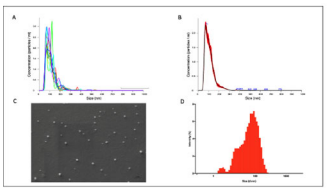


Figure 4. 1. Exosome characterizations based on size and shape. (a) Nanoparticle Tracking Assay (NTA) FTLA concentration/Size graph. (b) Averaged FTLA Concentration/Size graph. (c) Scanning Electron Microscope (SEM) image. (d) Size distribution of *R. sativus* exosome with zeta sizer.

P998
EFFECT OF ANTIHYPERTENSIVE MEDICATIONS ON BONE MINERAL DENSITY IN ADULTS AGED 18 YEARS AND ABOVE AT A TERTIARY CARE HOSPITAL IN TAIWAN

N.-C. Shih[1,2]

[1]Dept. of Family Medicine, Taichung Veterans General Hospital, [2]Institute of Medicine, Chung Shan Medical Univ., Taichung, Taiwan

Objective: To investigate the effect of classic antihypertensive drugs on BMD and risk of osteoporosis among adult hypertensive patients.
Methods: In this cross-sectional study, adults (≥ 18 y) diagnosed with hypertension were consecutively enrolled at a single medical center from January 2000 to December 2021. Individuals who had been taking antihypertensive medications for more than 3 months after the diagnosis of hypertension and had undergone DXA examination were further selected for the study. We evaluated differences in femoral neck and lumbar spine BMD and estimated the odds ratios (ORs) of osteoporosis between adults groups with different antihypertensive use.
Results: A total of 1255 patients (584 males and 671 females) with mean age of 69.7 ± 12.5 y were included. Among them, 574 individuals were diagnosed with osteoporosis, 504 with osteopenia, and 177 with normal bone density. Regardless of femoral neck BMD, lumbar spine BMD, T-score (spine), or T-score (femur), there were significant differences among individuals taking different antihypertensive drug (angiotensin-converting enzyme [ACE] inhibitors/angiotensin receptor blockers [ARBs], calcium channel blockers [CCBs], combined users) ($P < 0.01$). Patients using ACE inhibitors/ARBs (OR = 0.66; 95%CI 0.51, 0.86; p = 0.002), β-blockers (OR = 0.54; 95%CI 0.40, 0.74; $p < 0.001$) showed a lower risk of osteoporosis compared to those on CCBs as the reference group.
Conclusion: Compared to patients with hypertension who take CCBs, those treated with ACE inhibitors, ARBs, or β-blockers demonstrated a greater reduction in the risk of osteoporosis.
Acknowledgments: Thanks to Chiann-Yi Hsu and Biostatistics Team at Taichung Veterans General Hospital, Taichung, Taiwan.

P999
EXPERIMENTAL CORRECTION OF THYROID STATUS IN PATIENTS WITH RHEUMATOID ARTHRITIS

O. A. Rusanova[1], O. I. Emelianova[1], S. S. Spitsina[1], A. S. Trofimenko[1], S. A. Bedina[1]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, Russia

Системные аутоиммунные заболевания, развивающиеся вследствие недостатков иммунной регуляции, приводят к неконтролируемой гиперпродукции антител к компонентам собственных тканей человека и развитию аутоиммунного воспаления, в которое вов, лекается, в том числе, и щитовидная железа. Для устранения антител из крови мы используем метод гемосорбции с использованием иммобилизованных гранулированных препаратов с магнитными свойствами — модификацию, предложенную Гонтаром и др. в 2007 году.
Цель. Изучить in vitro изменения продукции антител к гормонам щитовидной железы (трийодтиронину и тироксину) на экспериментальной модели гемосорбции у больных ревматоидным артритом.
Методы. Под наблюдением находились семьдесят пять больных ревматоидным артритом; из них у 25 человек было сопутствующее заболевание щитовидной железы. Вторую группу составили 65 больных с диагнозом системная красная волчанка; из них у 33 человек были заболевания щитовидной железы. В третьей группе из 42 больных системной склеродермией у 9 человек имелось заболевание щитовидной железы. Группу сравнения составили 30 практически здоровых лиц. Антитела к трийодтиронину и тироксину определяли методом твердофазного иммуноферментного анализа с использованием иммобилизованных гранулированных препаратов этих гормонов. Элиминацию антител достигали пропусканием крови через полиакриламидный носитель с магнитными свойствами (как сорбент) с ковалентно иммобилизованными тиреоидными гормонами с помощью перистальтического насоса. Гормоны вводили в гранулированный препарат методом эмульсионной полимеризации с последующей фиксацией глутаровым альдегидом. Антитела измеряли до и после сорбции.
Полученные результаты. В контрольной группе антитела к трийодтиронину измеряли 0,033 ± 0,022 единицы поглощения, а антитела к тироксину—0,045 ± 0,018 единиц поглощения. У больных ревматоидным артритом до сорбции уровень антител к трийодтиронину составлял 0,132 ± 0,027 единиц оптической плотности, а антител к тироксину—0,156 ± 0,06 единиц оптической плотности. После сорбции уровень антител к трийодтиронину составил 0,037 ± 0,007 единиц оптической плотности, а антител к тироксину—0,039 ± 0,009 единиц оптической плотности. Во второй группе больных системной красной волчанкой исходные значения составили 1,127 ± 0,064 ед. оптической плотности и 0,135 ± 0,077 ед. После процедуры значения составили 0,82 ± 0,008 единиц оптической плотности и 0,062 ± 0,007 единиц оптической плотности. В третьей группе больных системной склеродермией до сорбции уровень антител к трийодтиронину находился в пределах 0,129 ± 0,056 единиц поглощения, антител к тироксину—0,146 ± 0,026 единиц поглощения; после процедуры значения составили 0,057 ± 0,009 единиц оптической плотности и 0,048 ± 0,008 единиц оптической плотности соответственно.
Заключение. Экспериментальная модель гемосорбции с использованием сорбентов на основе гормонов щитовидной железы для элиминации антител из крови больных ревматоидным артритом показала достоверное снижение антител к трийодтиронину и тироксину по сравнению с исходными значениями. Уровень этих антител стал соответствовать уровню антител в контрольной группе, что позволило улучшить состояние щитовидной железы у пациентов с системными нарушениями и нормализовать функцию щитовидной железы.

P1000
AUTOIMMUNE MARKERS OF NERVOUS SYSTEM LESION IN PATIENTS WITH RHEUMATOID ARTHRITIS

O. A. Rusanova[1], O. I. Emelianova[1], S. S. Spitsina[1], A. S. Trofimenko[1], S. A. Bedina[1]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, Russia

Широкий спектр патологических неврологических признаков у больных аутоиммунными системными заболеваниями позволяет рассматривать их как модельные системы для изучения патогенетического механизма развития поражений центральной и периферической нервной системы. Потенциальными мишенями аутоиммунной агрессии могут быть различные биополимеры нервной ткани, в том числе миелин, его основной белок и белок S-100.

ЦЕЛЬ. Определение диагностической значимости аутоантител к основному белку миелина (ОБМ) и белку S-100 для прогнозирования неврологических нарушений центральной и периферической нервной системы у больных ревматоидным артритом.

МАТЕРИАЛЫ И МЕТОДЫ. В исследование вошли 94 пац, иента, госпитализированных в 25 городских больниц с диагнозом ревматоидный артрит. Антитела к ОБМ и белку-100 определяли в сыворотке крови методом непрямого иммуноферментного анализа (ИФА) с использованием магнитных сорбентов, магнитные сорбенты синтезировали методом эмульсионной полимеризации в токе газообразного азота.
ПОЛУЧЕННЫЕ РЕЗУЛЬТАТЫ. В сыворотке крови здоровых лиц уровень антител к ОБМ составлял 0,03 ± 0,01 ЕД, антител к белку S-100—0,02 ± 0,01 ЕД. Повышенные антитела к ОБМ выявлены у 37 (39,4%) больных ревматоидным артритом, пов, ышенные антитела к S-100 выявлены у 30 (32,4%) больных ревматоидным артритом. Высокий уровень антител к BMP и белку S-100 при ревматоидном артрите связан с поражением централ, ьной и периферической нервной системы. При ревматоидном артрите максимальные значения антител к ОБМ выявлены у больных с периферическим поражением периферической нервной системы (мононевропатия и невралгия тройничного нерва) и ЦНС (нарушения сна, фиксационная амнезия, забывание давно минувших событий, дизартрия, поражение лобных долей и эпилептиформные припадки, вертебробазилярная недостаточность).
ВЫВОДЫ. Выявленные закономерности поражения периферической и центральной нервной системы у больных ревматоидным артритом с повышенным уровнем антител к ОБМ позволяют прогнозировать клиническое течение заболевания и обеспечить раннее лечение начинающегося заболевания.

P1001
BONE MINERAL DENSITY CURVE FROM A QATARI POPULATION: DATA FROM QATAR BIOBANK

O. Alsaed[1], F. Alam[1], N. Abdulla[1], I. Abdulmomen[1], A. Lutf[1], S. Alemadi[1]

[1]Hamad Medical Corporation, Dept. of Medicine, Rheumatology Division, Doha, Qatar

Objective: Based on the available hip fracture data from the gulf cooperation council (GCC) countries, the incidence rate of fragility fracture is much lower to that of European and North American populations which makes populations from GCC to have a lower probability of fracture risk when these fracture data are used to formulate each nation fracture risk assessment (FRAX®) tool. In light of this, we hypothesized that the BMD of Arab population is also different from North America and European countries. We aimed to generate a reference BMD curve of neck of femur (NOF) and total hip (TH) from Qatari healthy individuals and compare it with age-sex matched individuals from US NHANES (National Health and Nutrition Examination Survey) population (Z score).
Methods: BMD readings of Qatari individuals aged between 20–69 years old were obtained from Qatar Biobank i-DXA (Lunar®) database. The exclusion criteria were: history of major osteoporotic fracture, renal impairment (eGFR < 60 ml/min), primary hypo/hyper parathyroid diseases, uncontrolled hyperthyroidism, hyperadrenalism, hypogonadism, active malignancy or history of malignancy, chronic liver diseases, inflammatory bowel disease, uncontrolled diabetes mellitus type II (HbA1c > 6.5), diabetes mellitus type I, early oophorectomy or early menopause (below age of 45), severe deficiency of 25 hydroxyvitamin D < 20 ng/ml (50 nmol/L), any autoimmune rheumatic diseases, history of using anti-osteoporosis drugs, chronic use of systemic glucocorticoid, sex hormone deprivation therapy, anticonvulsants and heparin, BMI < 18 or > 35 kg/m^2 and participants with short stature < 150 cm. The study population was divided into five 10-y age groups: 20–29, 30–39, 40–49, 50–59, and 60–69. Conventionally, the sample size of 30 is sufficient for normative measures.
Results: 523 subjects were captured. Female to male ratio for each age group 20–29, 30–39, 40–49, 50–59, and 60–69 was 62:51, 74:80, 40:48, 40:40 and 41:47, respectively. Males had higher BMD in all age groups in both NOF and TH. BMD peaked at age of 20 s in males and at age of 30 s in females (Fig. 1). The lowest Z-score (-0.957) was observed at females age group 20–29 (Table 1).

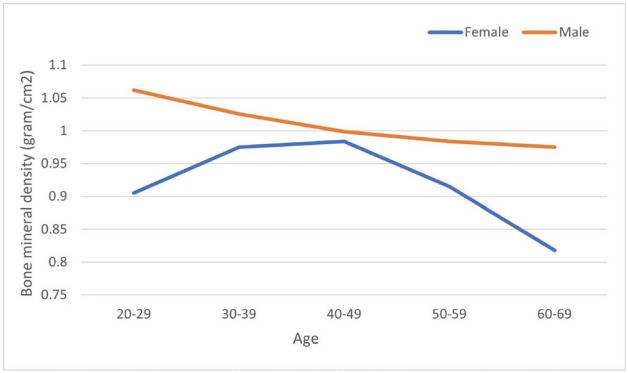


Figure 1. Comparison between males and females' neck of femur BMD at different age groups.

Table 1. Mean BMD (standard deviation) of neck of femur and total hip at different age groups with the corresponding mean Z-score.

	Female				Male			
Age	No.	Total hip (SD)	NOF (SD)	NOF Z-score	No.	Total hip (SD)	NOF (SD)	NOF Z-score
20-29	62	0.929 (0.102)	0.905 (0.109)	-0.957	51	1.073 (0.136)	1.062 (0.133)	-0.181
30-39	74	1.009 (0.124)	0.975 (0.123)	-0.189	80	1.057 (0.140)	1.026 (0.144)	-0.190
40-49	40	1.022 (0.130)	0.984 (0.153)	0.202	48	1.067 (0.127)	0.999 (0.129)	-0.107
50-59	40	0.973 (0.132)	0.915 (0.126)	0.060	40	1.074 (0.114)	0.984 (0.111)	0.094
60-69	41	0.910 (0.107)	0.818 (0.115)	-0.208	47	1.077 (0.134)	0.975 (0.130)	0.305
No, number; NOF, neck of femur; SD, standard deviation								

Conclusion: The NOF Z-score of the healthy Qatari individuals is within 0.3 standard deviation except for females at age of 20 s, it is close to 1.

P1002
CLINICAL CHARACTERISTICS AND MAJOR ADVERSE CARDIOVASCULAR EVENTS IN PATIENTS USING ROMOSOZUMAB

O. Alsaed[1], I. Abdulmomen[1], S. Alemadi[1]

[1]Hamad Medical Corporation, Dept. of Medicine, Rheumatology Division, Doha, Qatar

Objective: Usually, patients with osteoporosis are elderly and have multiple cardiovascular disease comorbidities. Romosozumab is a novel anabolic agent that is approved for postmenopausal women with very high-risk profile for fragility fractures. The USA of Food and Drug Administration has labeled romosozumab use as a potential risk for myocardial infarction, stroke, and cardiovascular death. Which hinders physicians in prescribing this agent. We aimed to elaborate the number of major adverse cardiovascular events (MACE) and ischemic stroke associated with romosozumab use in Qatar population from Jan 2020 to Dec 2023.
Methods: All prescriptions of romosozumab were captured electronically from the database of the pharmacy of Hamad Medical Corporation (HMC) from Jan 2020 to Dec 2023. Patients with nondispensed prescriptions were excluded from the analysis. Electronic medical records (EMR) of these patients were reviewed retrospectively to identify the demographic and clinical characteristics, baseline atherosclerotic cardiovascular disease (ASCVD) score, starting and stopping dates of romosozumab, MACE and ischemic stroke during romosozumab use.

Results: 31 romosozumab prescriptions were identified from the database of the pharmacy of HMC during the study period. Data of three subjects were excluded from the analysis as their prescriptions were not dispensed. The total number of patients who received romosozumab during the study period was 28 subjects with mean (± SD) age 67.6 (± 11.5) y. Females were 26 (92%) subjects. The baseline ASCVD score was as the following: low risk 8 (28%), borderline 2 (7.1%), intermediate 6 (21.4%), and high 7 (25%). ASCVD score was not assessable in 5 subjects due to missing variables from EMR. 15 (53.6%) subjects had at least one fragility fracture. The mean (± SD) T-score of the cohort received romosozumab was -3.3(± 0.8). Anti-osteoporosis medications naïve subjects were 16 (57.1%). The number of subjects who received zoledronic acid, alendronate, denosumab or teriparatide before romosozumab was 5(17.9%), 3(10.7%), 5(17.9%) 5(17.9%), respectively. The mean (± SD) duration of romosozumab therapy was 10.6 (± 4.7) months. Two subjects stopped romosozumab before completing the 12 months therapy for nonmedical reasons. One subject received romosozumab for two years. No reports of MACE or ischemic stroke from this cohort during the study period.
Conclusion: There were no MACE or ischemic stroke reports during receiving romosozumab in patients with high risk ASCVD score. This finding needs to be confirmed in a larger population with comparator arm.

P1004
GENDER DISPARITIES IN AXIAL SPONDYLOARTHRITIS: UNRAVELING CLINICAL CHARACTERISTICS AND DISEASE DYNAMICS

O. Boudriga[1], H. Ferjani[1], D. Ben Nessib[1], K. Maatallah[1], D. Kaffel[1], W. Hamdi[1]

[1]Kassab Institute of Orthopedics, Rheumatology, Tunis, Tunisia

Objective: Axial spondyloarthritis (AxSpA) is a chronic inflammatory rheumatic disorder subdivided into radiographic AxSpA (r-AxSpA) and non-radiographic AxSpA (nr-AxSpA). Historically, SpA was predominantly considered a male disease. However, increased disease awareness has altered this perspective, leading to a greater inclusion of women. This study aims to examine the clinical presentation, disease onset characteristics, metrology, HLA frequency, and clinical features of male and female AxSpA patients.
Methods: A retrospective study was conducted, including 115 patients meeting the Assessment of SpondyloArthritis International Society (ASAS) classification criteria for AxSpA published in 2009. We compared features between genders and utilized SPSS 26.0 for statistical analysis.
Results: The study comprised 40 (34.8%) females and 75 (65.2%) males. Statistically significant differences in ASAS classification were observed; nr-AxSpA was more prevalent among females (67.5%) than males (17.3%), P = 0.01. HLA-B27 frequency was comparable between men and women (45.9 vs. 40%, P = 0.594). Symptom distribution at disease onset was similar in both genders. Enthesopathy was more prevalent among women than men (57.5 vs. 37.3%, P = 0.038). Coxitis was significantly predominant in males than females (52.5 vs. 16.7%, P < 0.0001). No differences were noted in extra-articular manifestations (uveitis, psoriasis, and inflammatory bowel disease). In males, disease onset was more acute (47.5 vs. 16.7%, P < 0.001). The age at the beginning of the disease was 39.95 ± 11.05 y for females and 28.45 ± 10.47 y for males (P < 0.001). The time to diagnosis (in months) was 34 [11.5–132] for females and 14 [3–60] for males (P < 0.001). Both men and women had comparable functional impairment measured by BASFI (50 vs. 44.1%, p = 0.570) and disease activity measured by ASDAS CRP (44.4 vs. 38.9%, p = 0.931).
Conclusion: Nr-AxSpA is more frequent in women than in men, although radiographic disease is more prominent in men. The prevalence of HLA-B27 is comparable in both genders with AxSpA. Males are older at the onset of the disease and were diagnosed sooner than females. Females had similar disease activity and functional impairment as males.

P1005
ASSESSMENT OF CLINICAL, RADIOLOGICAL, AND BIOLOGICAL CHARACTERISTICS IN AXIAL SPONDYLOARTHRITIS WITH COXITIS

O. Boudriga[1], H. Ferjani[1], D. Ben Nessib[1], K. Maatallah[1], D. Kaffel[1], W. Hamdi[1]

[1]Kassab Institute of Orthopedics, Rheumatology, Tunis, Tunisia

Objective: Axial spondyloarthritis (axSpA) stands out as the most prevalent chronic inflammatory rheumatic disease involving the hips, representing a significant indicator of disease severity due to its considerable impact on functionality. This study seeks to elucidate the clinical, biological, and radiological features of axSpA with coxitis, as well as to identify factors associated with its occurrence.
Methods: A retrospective and analytical study was undertaken, encompassing patients diagnosed with axSpA. Data on demographics, clinical aspects, biological markers, radiological findings, and activity scores were collected. The significance threshold was set at $p < 0.05$.
Results: The study involved 115 axSpA patients, with 65.2% being men. The mean age was 40.6 ± 11.05 y, and the mean age at onset was 33.02 ± 10.72. Smoking prevalence was 11.3%. HLA-B27 was positive in 44.35%, and uveitis occurred in 7.83% of patients. Coxitis was present in 39.13% of patients, initiating in 11.11% and being bilateral in 66.89% of cases. Coxitis was more prevalent in men, with males constituting 75.55% in axSpA with coxitis compared to 58.57% without coxitis ($p < 0.001$). The mean age of SpA onset was lower in patients with coxitis (29.24 ± 11.5 vs. 36.61 ± 11.51 y; p = 0.003). Pure axial form and low back and buttock pain were more common in patients with coxitis (17.78 vs. 13.33%, p = 0.034, 31.11 vs. 22.22%, p = 0.023, respectively). Enthesopathy was more frequent in SpA without coxitis (53.33 vs. 31.11%, $p < 0.001$). Inflammatory markers (CRP and ESR) were significantly higher in patients with coxitis (19.16 ± 23.21 vs. 8.58 ± 14.6, p = 0.008, and 44.82 ± 25.57 vs. 24.88 ± 17.42, $p < 0.001$ respectively). No significant differences were observed between the two groups for disease activity measured by ASDAS-CRP and BASDAI (p = 0.95; p = 0.38, respectively). The frequency of a family history of SpA, smoking, HLAB27, uveitis, and the presence of radiographic sacroiliitis remained unchanged, regardless of the presence or absence of coxitis. In multivariate analysis, coxitis was associated with male gender, early age of onset, and pure axial form.
Conclusion: Our study reveals an association between the presence of coxitis and male gender, early disease onset, the pure axial form of axSpA, and biological inflammatory syndrome.

P1006
DETERMINANTS OF HIP INVOLVEMENT IN AXIAL SPONDYLOARTHRITIS

H. Ferjani[1], O. Boudriga[1], D. Ben Nessib[1], K. Maatallah[1], D. Kaffel[1], W. Hamdi[1]

[1]Kassab Institute of Orthopedics, Rheumatology, Tunis, Tunisia

Objective: Hip involvement in axial spondyloarthritis (axSpA) significantly contributes to the functional prognosis and adversely impacts the patient's quality of life (1). Recognizing these factors has

the potential to shape our management strategy through the formulation of targeted therapeutic protocols. This study aims to ascertain the factors associated with hip involvement in spondyloarthritis.

Methods: This single-center prospective observational study was conducted between June 2021 and June 2023. AxSpA patients meeting ASAS criteria were included, and comprehensive clinical, biological, and imaging data were collected on a patient-by-patient basis.

Results: A total of 115 axSpA patients were evaluated, with 39.13% (45 patients) exhibiting hip involvement. Among these, there were 34 men and 11 women (gender ratio = 3.09), with an average age of 40.6 ± 11.05 y. The biological inflammatory syndrome was observed in 68.89% of cases, and HLA B27 was found in 35.56% of patients. Anatomio-radiological forms included the destructive form (37.78%), condensant constructive form (22.22%), initial form (24.44%), and synostotic form (15.56%). TNFα treatment was initiated in 68.89% of cases, with a third of patients undergoing total hip arthroplasty. Factors associated with hip involvement included functional impotence assessed by BASFI ($p = 0.002$), limitation of spinal and joint mobility by BASMI ($p < 0.001$), structural damage by total BASRI ($p < 0.001$), and initiation of anti-TNFα treatment ($p = 0.003$). Conversely, the age of hip involvement, gender, bilateral involvement, high scores of the BASDAI and ASDAS indices, and the presence of biological inflammatory syndrome did not appear to be implicated.

Conclusion: Hip involvement in axSpA appears to be prevalent in our country, serving as a significant predictor of poor prognosis and indicating a severe form of the disease.

Reference: (1) Ziadé N, et al. Rheumatol Oxf Engl 2022;61:667.

P1007
ASSESSING DISEASE ACTIVITY AND FUNCTION IN PATIENTS WITH NONRADIOGRAPHIC AXIAL SPONDYLOARTHRITIS: A COMPARISON BETWEEN CLINICAL AND IMAGING ARMS

O. Boudriga[1], H. Ferjani[1], D. Ben Nessib[1], K. Maatallah[1], D. Kaffel[1], W. Hamdi[1]

[1]Kassab Institute of Orthopedics, Rheumatology, Tunis, Tunisia

Objective: The concept of axial spondyloarthritis (axSpA) and nonradiographic axSpA (nr-axSpA), a subgroup of axSpA, has recently emerged. There are several studies proving the similar levels in disease activity and quality of life in patients with or without structural damage in spondyloarthritis. The aim of this study is to compare disease activity, functional status and quality of life in patients from the clinical and imaging arm of nonradiographic axial spondyloarthritis.

Methods: A cross-sectional survey was conducted in 40 patients with nr-axSpA meeting the Assessment of SpondyloArthritis International Society (ASAS) classification criteria published in 2009. Demographics and clinical data were collected. Disease activity (BASDAI) and functional status (BASFI) were compared between the patients with or without MRI data for sacroiliitis. The level of significance was set to 0.05.

Results: A total of 34 patients from the imaging arm of nonradiographic arm and 12 patients from the clinical arm of nr-axSpA patients were included in this analysis. A higher proportion of patients from the imaging arm were female patients (68.9 vs. 32.1%). The mean age was 39.8 ± 11.08 in the imaging arm and 39.67 ± 11.57 in the clinical arm ($p = 0.865$), with mean symptoms duration in both groups respectively 3.76 ± 3.46 and 2.75 ± 1.48 y ($p = 0.345$). The mean value of C-reactive protein was predominant in the imaging arm (15.81 ± 15.59 and 7.05 ± 10.04, $p = 0.028$). The disease activity determined using BASDAI was 5.3 ± 2.01 vs. 4.8 ± 2.18 ($p = 0.594$) and using ASDAS-CRP 2.31 ± 0.87 vs. 2.05 ± 0.52 ($p = 0.835$) in the imaging and clinical arm. The evaluation of the function BASFI was 4.96 ± 1.22 vs. 4.48 ± 1.14, $p = 0.865$ in both groups of patients with nr-axSpA.

Conclusion: Patients in the both imaging and clinical arms of nr-axSpA exhibit similar clinical features, with a notable predominance of biological inflammatory syndrome in the imaging arm. The functional status of the disease remains comparable among the investigated subgroups of nr-axSpA patients.

P1008
DETERMINANTS OF CERVICAL PROGRESSION IN INDIVIDUALS WITH AXIAL SPONDYLOARTHRITIS

H. Ferjani[1], O. Boudriga[1], D. Ben Nessib[1], K. Maatallah[1], D. Kaffel[1], W. Hamdi[1]

[1]Kassab Institute of Orthopedics, Rheumatology, Tunis, Tunisia

Objective: The assessment of cervical, lumbar spinal structures, and hip joints holds significant importance, as reflected in variables within scoring systems for patients with axial spondyloarthritis (axSpA). This study aimed to investigate the factors contributing to cervical spinal progression in patients with axSpA.

Methods: Patients diagnosed with axSpA, whose cervical modified Stoke Ankylosing Spondylitis Spinal Score (mSASS) was evaluated through cervical X-rays, were included in the study. Demographic, clinical, and laboratory characteristics were recorded. The relationship between the presence of cervical structural damage and other factors was assessed through both univariate and multivariate analyses.

Results: Among the 115 patients in the study, 65.22% were male, and the median age at diagnosis (IQR) was 33 (14). Additionally, 65.22% of the patients had radiographic axSpA. Demographic, clinical, and laboratory characteristics were comparable in the study groups. Cervical involvement was identified in 21 patients (18.26%). The presence of cervical structural damage was associated with symptom duration ($p = 0.004$), age at symptom onset ($p = 0.011$), age at diagnosis ($p < 0.001$), the presence of total ankylosis in sacroiliac joint X-ray ($p < 0.001$), cervical mSASS score ($p < 0.001$), the presence of cervical syndesmophyte ($p < 0.001$), and baseline lumbar mSASS score ($p < 0.001$). Cervical progression did not show associations with HLA-B27, smoking, the presence of either extramusculoskeletal or peripheral involvement, nor with disease activity scores (BASDAI, ASDAS-CRP). In multivariate analysis, age at diagnosis ($p < 0.001$), the presence of cervical syndesmophyte ($p = 0.014$), and sacroiliac joint score ($p = 0.004$) were identified as factors associated with cervical progression.

Conclusion: It is essential to consider age at diagnosis, the presence of spinal involvement, and sacroiliac joint score as potential predictors of cervical spinal progression during the follow-up of axSpA patients.

P1009
COST-EFFECTIVENESS ANALYSIS OF PHARMACEUTICAL-GRADE CHONDROITIN SULFATE IN THE TREATMENT OF KNEE OSTEOARTHRITIS: A POST HOC ASSESSMENT DERIVED FROM INDIVIDUAL PATIENT DATA FROM A RANDOMISED CLINICAL TRIAL

O. Bruyère[1], J.-Y. Reginster[1]

[1]1 WHO Collaborating Center for Epidemiologic Aspects of Musculo-skeletal Health and Ageing, Division of Public Health, Epidemiology and Health Economics, Univ. of Liège, Belgium, Liège, Belgium

Objective: In a previously published randomised, placebo-controlled trial, 800 mg/d of pharmaceutical-grade chondroitin sulfate (CS) was shown to be superior to placebo in reducing pain and improving function over 6 months in patients with symptomatic knee osteoarthritis (OA) (Reginster J-Y, et al. Ann Rheum Dis 2017;76:1537). The aim of the current post hoc analyses is to evaluate the cost-effectiveness of CS compared to placebo in a European perspective using individual patient data from this clinical trial.
Methods: Patients with knee OA randomised to CS or placebo were followed up at 1, 3 and 6 months. The algo-functional Lequesne index was used to derive the EQ-5D-5L score based on a validated formula. The EQ-5D-5L scores at each time point were used to calculate the changes in quality-adjusted life years (QALYs) with the area-under-the-curve (AUC) method. Costs were assessed using the average price of CS in the countries where (1) the original study took place and (2) CS is currently marketed. The costs of CS in 3 countries were then used (i.e., Czech Republic, Italy and Switzerland). The incremental cost-effectiveness ratio (ICER) threshold for CS to be considered cost-effective was set at 91,8705 EUR per QALY (equivalent to the usually recommended threshold of US $100,000). The study used an intention-to-treat (ITT) population, i.e., patients who received one dose of the study drug, and imputed missing values using the basal observation carried forward method.
Results: No significant differences in baseline characteristics were observed between the CS group (N = 199) and the placebo group (N = 205). The mean cost of CS for 6 months of treatment was 179 EUR. After 6 months of treatment, CS showed a mean ICER of 31,415 EUR per QALY gained, indicating cost-effectiveness compared to placebo.
Conclusion: These results highlight the role of CS as a cost-effective therapeutic option in the management of OA. However, further studies taking into account the use of other health care resources are warranted for a more complete understanding.
Disclosures:
Research Grant from IBSA.

P1010
MAPPING THE LEQUESNE FUNCTIONAL INDEX INTO THE EQ-5D-5L UTILITY INDEX IN PATIENTS WITH KNEE OSTEOARTHRITIS

N. Dardenne[1], A.-F. Donneau[1], O. Bruyère[2]

[1]Biostatistics Center (B-STAT), Univ. Hospital and Univ. of Liège, Belgium, Liège, Belgium, [2] WHO Collaborating Center for Epidemiologic Aspects of Musculo-skeletal Health and Ageing, Division of Public Health, Epidemiology and Health Economics, Liège, Belgium

Objective: To map the Lequesne Index onto the EuroQol 5 Dimension (EQ-5D-5L) utility index in patients with knee osteoarthritis (OA).
Methods: The baseline data from a previously published randomized controlled trial were used to develop mapping functions. All patients diagnosed with knee osteoarthritis (OA) completed both the EQ-5D-5L and Lequesne questionnaires. Out of all patients included at baseline, 461 were used for the mapping development phase and 230 for the validation phase. For the development phase, various modelling techniques, including general linear models (GLM), Tobit and beta regression models, were employed to derive several mappings functions. Factors such as age, sex, and BMI were also taken into account. The selection of preferred models was based on the Akaike information criteria (AIC), the Bayesian information criteria (BIC), the adjusted R^2, the mean absolute error (MAE), and root mean squared error (RMSE). For the validation phase, the pre-selected derived functions were assessed through MAE, RMSE, and the intraclass correlation coefficient (ICC). This study follows the MApping onto Preference-based measures reporting Standards (MAPS) statement.
Results: Five models were developed by means GLM, Tobit and Beta regressions. Two models including the effect of age, sex and/or BMI and the Lequesne Index as explanatory variables presented the best goodness-of-fit indexes whatever the type of regression. For the validation phase, the predictive performance of these models was similar for the three types of regression. They also showed similar MAE and RMSE values., although the ranges obtained using the Beta regression models were wider and closer to those of the validation dataset. ICC values were also better for the Beta regression models. At last, both models tented to overpredict for lower EQ-5D-5L values while they tended to underpredict for better health status, whatever the type of regression.
Conclusion: To the best of our knowledge, these mapping functions represent the very first attempts to translate the Lequesne Index to EQ-5D-5L values in patients with knee OA. These functions demonstrated a satisfactory fit and precision, offering valuable tools for clinicians and researchers, particularly in situations where cost-effectiveness studies are required, and generic preference-based health-related quality of life instruments for utility derivation are not accessible.
Disclosures:
Research Grant from IBSA.

P1011
COMPARISON OF REGENERATIVE METHODS IN TREATMENT OF OSTEOCHONDRAL LESIONS: EVALUATION IN AN ANIMAL MODEL

O. Burianov[1], T. Omelchenko[1], Y. E. Levytskiy[1], L. Khimion[2]

[1]Bogomolets National Medical Univ., Traumatology and Orthopedics Dept., [2]Shupyk National Healthcare Univ. of Ukraine, Internal Diseases, Family Medicine, Hematology and Transfusiology Dept., Kyiv, Ukraine

Objective: To evaluate by morphologic studies and compare results of treatment of the osteochondral lesions with use of different regenerative methods (filling with collagen-fibrin matrix, BMDCT, PRP) in experimental study on 32 rabbits.
Methods: The study included 4 series of experimental animals which were given different regenerative treatment and no treatment after artificial surgical standard osteochondral defects (SOD) had been performed. SOD was reproduced in the medial part of the femur of a critical size with a diameter of 3 mm in a depth of 5 mm. The defect was not filled (1st series, control group), filled with collagen-fibrin matrix (2nd series), collagen-fibrin matrix with PRP (3rd series) or with BMDCT (4th series). On 41st day after damage we performed histologic evaluation of the regenerate's tissue (integration into the surrounding tissues, structure, content of cellular structures,

noncellular elements, which formed in the defect) was using scale recommended by the Committee of the International Cartilage Regeneration Union (SCRS) with our modifications.
Results: Analysis of the results of treatment using a modified histological evaluation scale showed that hyaline cartilage was present only in the samples from experimental animals of series No. 3 and No. 4 and they did not show significant stratification of the surface of the cartilage. In regenerates samples from group No. 3, the formation of hyaline cartilaginous tissue with chondroblast, chondrocytes and fibrochondrocytes, which densely filled the bone and cartilage defects, was found in the area of the bone and cartilage defect. In the experimental group of animals No. 4, defects located in the articular cartilage were filled with a dense, well developed hyaline cartilaginous tissue with a high degree of integration with the edges of the defect. The comparison of the regenerates histology in the control animals (1st series) and experimental groups was performed and significant difference was found in all parameters between controls and samples from PRP and BMDCT groups, the latter demonstrated better quality of the regenerate tissue and its cellular composition.
Conclusion: Use of the regenerative techniques in treatment of the osteochondral artificial defects in experiment demonstrates better outcomes then natural healing, with the most promising results proved by morphology study in case of BMDCT application.

P1012
ASSESSMENT OF MENISCAL EXTRUSION IN PATIENTS WITH DEGENERATIVE MEDIAL MENISCUS ROOT TEAR FOLLOWING SURGICAL TREATMENT

O. Burianov[1], V. Lykhodii[1], M. Zadnichenko[1], T. Pshenychnyi[2], V. Lianskorunskyi[1]

[1]Bogomolets National Medical Univ., Dept. of Traumatology and Orthopedics, [2]SI "The Institute of Traumatology and Orthopedics" by NAMS of Ukraine, Kyiv, Ukraine

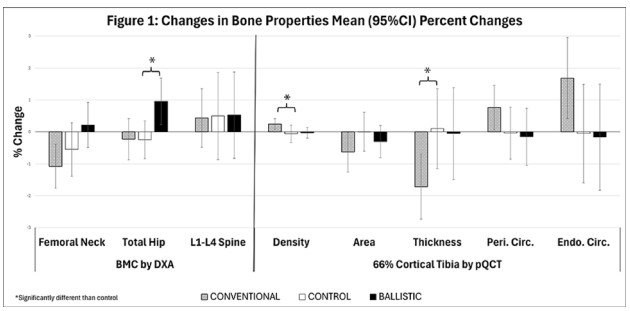
Objective: Compare of medial meniscal extrusion (MME) in patients with degenerative medial meniscal root tear (MMRT) after partial meniscectomy and transtibial medial meniscal root repair (without additional augmentation).
Methods: Observed pre- and postoperative (12 months) MRI scans of 55 patients with symptomatic degenerative medial meniscus root tear who underwent arthroscopic surgery. MME was evaluated as the distance between a vertical line passing by the outer edge of medial tibial plateaus and another vertical line tangential to the outer margin of the medial meniscus. Patients were divided into two groups. In the main group (n_m = 18) the repair of medial meniscus root tear was performed under arthroscopic control using transtibial fixation. In the comparison group (n_c = 37), a partial meniscectomy was performed, which consisted of the removal of the damaged posterior horn and part of the body of the medial meniscus under arthroscopic control.
Results: The mean age in patients of the main group was 53.61 ± 4.92 y, comparison group – 54.16 ± 4.4 y (p = 0.67). BMI in the main group was 32.1 ± 1.85, comparison group – 31.8 ± 1.92 (p = 0.68). In the main group were 14(77.8%) females and 4(22.2%) males and in the comparison group were 26 (70.3%) females and 11 (29.7%) males (p = 0.56). Before surgery, the MME in patients of the main group (n_m = 18) was 3.9 ± 1.2 mm, in the comparison group (n_c = 37)—3.2 ± 1.7 mm (p = 0.1). In the main group (n_m = 18) MME before surgery was 3.9 ± 1.2 mm and 12 months after surgery – 3.0 ± 1.8 mm (p = 0.1). In the comparison group (n_c = 37) MME before surgery was 3.2 ± 1.7 mm and 12 months after surgery – 4.0 ± 1.2 mm (p = 0.02). 12 months after surgery, on MRI in patients of the main group (n_m = 18) MME was 3.0 ± 1.8 mm, in the comparison group (n_c = 37)—4.0 ± 1.2 mm (p = 0.01).
Conclusion: Increasing of medial meniscal extrusion in patients with MMRT who underwent partial meniscectomy indicates progression of OA and worsening of MRI symptoms in short follow-up period. Medial meniscus root repair prevents further progression of the medial meniscal extrusion, and potentially it could decrease rapid progression of the knee OA, but it doesn't complete restore normal position of the medial meniscus.

P1013
EFFECT OF EIGHT MONTHS OF BALLISTIC AND CONVENTIONAL RESISTANCE EXERCISE TRAINING ON BONE STRENGTH IN POSTMENOPAUSAL WOMEN: THE REPROOF STUDY

O. Caliskan[1], E. A. Marques[1], J. P. Folland[1], K. Brooke-Wavell[1]

[1]Loughborough Univ., Loughborough, UK

Objective: High-load, progressive resistance training (RT) is recommended for osteoporosis (OP) prevention. Fast ballistic RT involves moving as explosively as possible with a light/moderate load, attempting to launch the load, if possible, to maximize power production throughout the whole movement, but effects on BMD are unknown. We aimed to investigate the influence of ballistic and conventional RT, relative to control, on BMC and BMD in postmenopausal women.
Methods: The resistance exercise programme on risk of osteoporosis and osteoarthritis in females (REPROOF) was an 8-month RCT involving healthy, postmenopausal (> 4 y) women (50–70 y), randomised to ballistic (BRT), conventional (CRT) resistance training and control (CON) groups. Both RT groups attended similar sessions twice a week with hack squats and unilateral calf raises. One repetition maximum (1RM) was measured monthly and used to determine undulating periodized loads between 20–50% 1RM in BRT and 60–80% 1RM in CRT. Both hips and lumbar spine were measured by DXA (GE iDXA), and the tibia was measured by pQCT (Stratec XCT-2000L). Group comparisons were made by regression adjusting for baseline.
Results: 109 women were randomised. 82 completed the study; 63.1 ± 3.7 y; 24.5 ± 3.5 kgm^{-2}. Femoral neck T-score -1.0. DXA scans were available in 28 BRT, 29 CRT and 25 CON and pQCT in 27 BRT, 26 CRT and 23 CON. Mean adherence was ~ 98% in RT groups. BRT showed significant improvements; total hip BMC by mean (95%CI) 0.33 (0.07, 0.59) g (p = 0.02) and BMD by 0.008 (0.001, 0.014) gcm^{-2} (p = 0.02) compared to CON. CRT increased cortical density by 3.18 (0.05,6.31) gcm^{-2} (p = 0.05) but reduced cortical thickness by -0.07 (-0.13,-0.01) mm (p = 0.03) relative to CON in (Fig. 1).



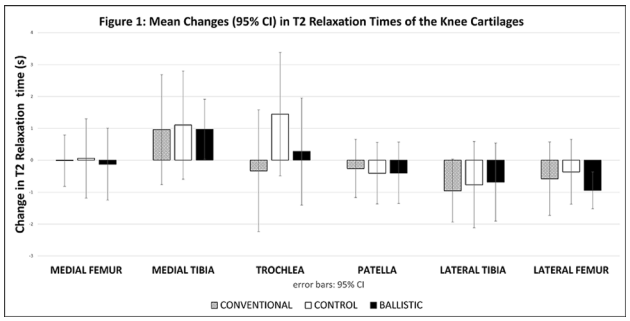
Conclusion: Ballistic RT increased total hip BMC and BMD. This contrasts with previous findings that high-load RT is necessary for bone adaptation. Ballistic RT was feasible in healthy postmenopausal women and may have a role in OP prevention.

P1014
CHANGES IN T2 RELAXATION TIMES OF THE KNEE JOINT FOLLOWING A BALLISTIC AND CONVENTIONAL RESISTANCE TRAINING PROGRAMME IN POSTMENOPAUSAL WOMEN: THE REPROOF STUDY

O. Caliskan[1], E. A. Marques[1], W. J. Rennie[2], J. P. Folland[1], K. Brooke-Wavell[1]

[1]Loughborough Univ., Loughborough, [2]Univ. Hospitals of Leicester NHS Trust, Leicester, UK

Objective: Resistance training (RT) is recommended for osteoarthritis management, but its role in prevention is less clear. T2 relaxation depends on cartilage water and collagen content, with higher values being predictive of osteoarthritis, but the effects of RT are unknown. Ballistic RT involves light to moderate loads at very high velocities, attempting to launch the load, whereas conventional RT involves higher loads at lower velocities. We aimed to investigate the change in T2 relaxation times after ballistic and conventional RT relative to controls in postmenopausal women.
Methods: The resistance exercise programme on the risk of osteoporosis and osteoarthritis in females (REPROOF) was 8-month RCT. Healthy, postmenopausal (> 4 y) women (50–70 y) were randomly allocated to ballistic (BRT), conventional (CRT), or control (CON) groups. Both RT groups attended similar twice-weekly sessions focused on hack squats and calf raises. Monthly measured one repetition maximum (1RM) used to calculate undulating periodized loads between 20–50% 1RM in BRT and 60–80% 1RM in CRT. 3D scans of the left knee were acquired by a 3 T MRI scanner (GE Discovery MR750w). Medial, trochlear, lateral femur, medial and lateral tibia, and patella T2 relaxation times were measured from sagittal T2 sequences. RM-ANOVA was used.
Results: 66 of 109 randomised participants (25BRT, 21CRT and 20CON; 63.1 ± 3.5 y; 24.7 ± 3.5 kgm^{-2}) had valid pre and post-scans. Adherence was 98% in both RT groups. Intratester CV in mapping was between 0.7 and 2.6% in all ROIs. T2 relaxation times decreased by 0.93 sn (CI: -1.51, -0.36, p = 0.003) in lateral femoral cartilage in the BRT with no difference between the RT groups and CON [group*ROI (p = 0.572) and group (p = 0.835)].



Conclusion: No significant differences were found between groups, indicating that neither type of RT had a detrimental effect on cartilage composition. BRT is feasible in this population with no adverse effects on knee cartilage despite greater impact.

P1015
DETERMINATION OF ANTIBODIES TO GLUTATHIONE PEROXIDASE IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS USING MAGNETIC-CONTROLLED IMMUNOSORBENTS

O. Emelyanova[1], O. Rusanova[1], A. Trofimenko[1], S. Spitsina[2]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, [2]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd State Medical Univ., Volgograd, Russia

Objective: Research in recent years has shown that free radical and peroxidation reactions also take part in the damage to the connective tissue structures of various organs and systems during the development and progression of the lupus process, the products of which can change the antigenic structures of tissue. Two antioxidant defense systems prevent the intensification of free radical oxidation—non-enzymatic (vitamins A and K, tocopherols, glutathione, etc.) and enzymatic, which includes superoxide dismutase (SOD), glutathione peroxidase (GP), glutathione reductase (GR), catalase (CAT), etc. GP has a powerful antiperoxide effect and plays an important role in the processes of oxidation-antioxidation. Since in systemic lupus erythematosus (SLE) there is an increase in reactive oxygen species, one would obviously expect a compensatory increase in the synthesis of components of the body's antioxidant system, in particular GP, which led to the inhibition of free radicals. But with SLE, on the contrary, the accumulation of secondary toxic products of free radical reactions occurs. Research shows that one of the reasons for the weakening of individual components of the enzyme antioxidant defense in rheumatic diseases is the formation of antibodies to antioxidant enzymes, including GP. We studied the development of additional criteria for laboratory immunodiagnosis of SLE using magnetically controlled immunosorbents based on glutathione peroxidase.
Methods: The serum of 30 donors, 40 with SLE was studied. SLE patients: 9 patients (22.2%) had a low degree of activity, 22 (55%) had a moderate degree and 9 patients (22.2%) had the maximum degree of activity of the pathological process. Antibodies to HP were determined using the enzyme immunoassay method when fixing the antigen in magnetically controlled sorbents using the Gontar method. The results were expressed in optical density units.
Results: In a study of blood serum from healthy individuals, the level of antibodies to GP was 0.196 ± 0.117 optical density units. Elevated levels of antibodies to GP were detected in 24 (60%) patients with SLE. In SLE patients, the level of antibodies to GP significantly depended on the pathological process ($p < 0.05$) and kidney damage ($p < 0.05$). Anti-GP antibodies were more often detected in patients with active SLE (ECLAM > 2). A positive correlation was found between the level of antibodies to GP and the values of the ECLAM activity index (r = 0.376, p = 0.04). As a result of immunosuppressive therapy, there was a tendency to reduce the level of antibodies to GP to 34.2%.
Conclusion: The determination of antibodies to GP in patients with SLE using magnetosorbents is diagnostically informative and can be used as an additional method for the immunodiagnosis of SLE. Detection of antibodies to GP may serve as an indication for active therapy with the inclusion of synthetic antioxidants.

P1016
DIAGNOSTIC VALUE OF CERULOPLASMIN INDICATORS IN PATIENTS WITH RHEUMATOID ARTHRITIS

O. Emelyanova[1], O. Rusanova[1], A. Trofimenko[1], S. Spitsina[2]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, [2]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd State Medical Univ., Volgograd, Russia

Objective: Antibody formation to ceruloplasmin (CP) in rheumatoid arthritis (RA) is a poorly understood problem. The choice of this copper-containing alpha 2—blood plasma glycoprotein, which has multienzyme properties, as an object of study was not accidental. CP is one of the main extracellular antioxidant enzymes; it plays an important role in the pathogenesis of rheumatic diseases, including RA. We aimed to improve the immunological diagnosis of RA by parallel determination of antibodies to CP, as well as its quantity and enzymatic activity.
Methods: The serum of 30 healthy individuals and 102 patients with RA was studied. Antibodies to CP were determined by ELISA using immobilized granular antigen preparations (IGAP) (modification of I.P. Gontar et al., 2002). Determination of the amount of CP was carried out using the enzyme immunoassay method according to I.S. Kuzmina et al. (1991) using a commercial enzyme-linked immunosorbent diagnostic kit produced by the Research Institute of Vaccines and Serums named after Mechnikov.
Results: According to ELISA data, the average level of antibodies to CP in donor serum was 0.020 ± 0.006 e.o.p. The level of normal indicators of specific antibodies, defined as $M \pm 2$ s, includes extinction values in the range from 0–0.086. The average value of oxidase activity and the amount of CP in healthy individuals was 716 ± 26.3 ng/ml and 921 ± 32 mg/ml, respectively. During the research, a significant increase in the content of antibodies to CP, activity and quantity of CP in patients with RA was revealed, in all cases, the studied parameters correlated with the degree of disease activity ($p < 0,05$), with the I degree of activity—antibodies to CP is 0.094 ± 0.012 e.o.p., CP activity is 952 ± 46.1 ng/ml, the number of CP is 1289 ± 71.4 mg/ml; at II degree activity – antibodies to CP 0.136 ± 0.007 e.o.p., CP activity—1164 ± 39.2 ng/ml, number of CP—1762 ± 67.3 mg/ml; at stage III activity—antibodies to CP—0.184 ± 0.011 e.o.p., CP activity—1369 ± 87.5 ng/ml, number of CP – 1796 ± 102.4 mg/ml. At the end of the course of inpatient treatment, compared with the initial data, there was a significant decrease in the activity and number of CP (at stage I of RA activity $p < 0,001$, and at II degree—$p < 0,01$ for both indicators, at III degree—$p < 0,05$). The decrease in antibodies to CP is characterized by slow dynamics, especially in patients with pronounced activity of the pathological process, which reflects serious disorders in the immune system that are not completely relieved by a 30-day course of hospital treatment.
Conclusion: Determining CP indicators allows us to expand the existing understanding of the pathogenesis of RA, and the determination of antibodies to CP can be used to improve methods of immunological diagnosis of this disease.

P1017
OPTIMIZING ELIMINATION OF ANTI-CARDIOLIPIN ANTIBODIES IN PATIENTS WITH ANTIPHOSPHOLIPID SYNDROME AS A COMPONENT OF PATHOGENETIC THERAPY FOR PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

O. Emelyanova[1], O. Rusanova[1], A. Trofimenko[1]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, Russia

Objective: Anti-cardiolipin antibodies (ACA) determine the development of a certain subtype of systemic lupus erythematosus (SLE) with signs of antiphospholipid syndrome (APS). We studied in vitro elimination of pathogenetic anti-cardiolipin antibodies in SLE patients with APS.
Methods: Magnetic sorbent was obtained by spatially oriented fixation of antigen taking into account the hydrophobic and hydrophilic properties of cardiolipin molecule. The study was conducted in accordance with the principles of the World Medical Association's Declaration of Helsinki; the patients' informed consent was obtained in each case. The diagnosis of APS was confirmed with Hughes and Harris criteria; verification of the diagnosis was done using ACR criteria. The activity of SLE was assessed using SLEDAI score. The group of SLE patients included 63 individuals aged 15–62. The mean SLE activity was 7.3 ± 3.6 points on SLEDAI score. Immunoadsorption was performed in vitro using 20 ml of a patient's blood which was perfused using a peristaltic micropump at a rate of 25 ml/h through a glass column containing 1 ml of magnetic hemosorbent. Antibodies to IgG cardiolipin were assessed prior to and after sorption using an immunoenzyme assay. The concentration of antibodies was shown in absorbance units. The findings were shown as an arithmetical mean ($M \pm m$), a difference was considered statistically significant at $p < 0.001$.
Results: Sorption of anti-cardiolipin antibodies using magnetic sorbents yielded a pronounced decrease in antibody concentration (baseline: 0.390 ± 0.021 absorbance units, afterwards: 0.141 ± 0.006 at $p < 0.001$).
Conclusion: Selective sorption of anti-cardiolipin antibodies is an innovative technique of immunosupportive therapy; it implies extracorporeal blood circulation in a column filled with an appropriate sorbent.

P1018
ASSESSMENT OF FACTORS AFFECTING FREQUENCY OF MORTALITY IN OLDER AGE GROUPS WITH PROXIMAL FEMOR FRACTURE

Y. Popenko[1], N. Shadchneva[1], V. Kaliberdenko[1], E. Kuliyeva[1], T. Shaldybin[2], A. Zakharova[1], O. Galkina[1]

[1]V.I. Vernadsky Crimean Federal Univ., [2]Medaira Clinic, Simferopol, Russia

Objective: Fractures of the proximal femur are among the most severe complications of osteoporosis. Mortality with this fracture reaches 16.5–27.3% one year after it was received (Kates SL et al.,

2010; Kang HY et al., 2010) and 34.5–39.0% after two years (Ngobeni RS et al., 2010; Hu F et al., 2012).
Methods: A continuous prospective 2-y observational study was conducted, which included all patients with low-energy fractures of the proximal femur. 446 people were examined, of which 112 were male (25.11%) and 334 female patients (74.89%), with an average age of 76.81 ± 10.32 y. Mortality was assessed in the hospital, after 3, 6, 12 and 24 months through telephone contact with the patient or his relatives, in some cases (if it was impossible to contact the patient) through a clinic at the place of residence. Statistical analysis was performed using the StatSoft, Inc. software package. STATISTICA (data analysis software system), version 12, MedCalc Statistical Software version 15.8 (MedCalc Software). The relationship between various factors and the mortality rate was assessed by calculating the rank correlation coefficient τ-Kendall and γ).
Results: During the study, overall in-hospital mortality was 9.66%, after 3 months – 21.75%, after 6 months – 26.46%, 12 months – 29.82%, 24 months – 34.53%. The correlation analysis carried out showed a significant relationship between in-hospital mortality and age and the presence of disability in all periods of observation. In addition, after 12 and 24 months, mortality was associated with MMSE scale scores when a patient had a pronounced decline in cognitive function, after 6, 12, 24 months – with the frequency of falls, the presence of visual impairment, and after 12 months – with Parkinson's. From the indicators of physical activity of patients at all stages of observation, a connection was established with the duration of walking before the fracture and the degree of restoration of mobility during hospitalization and after discharge from the hospital.
Conclusion: The mortality of patients after a fracture turned out to be directly related to the severity of their condition upon admission and the development of complications during hospitalization (delirium, deep vein thrombosis of the legs and its treatment), with the presence of severe concomitant pathology at the time of the fracture, primarily cardiovascular diseases and decreased cognitive function. In addition, the increased risk of death was influenced by the patient's level of physical activity before and after the fracture and a number of factors that increase the risk of falls (including visual impairment, Parkinson's, repeated falls).

P1019
CASE REPORT: FEMORAL HEAD AVASCULAR NECROSIS CAUSED BY CORTISONE IN HIGH DOSES IN A YOUNG PATIENT

O. Gelaj[1], B. Bulku[2], A. Kollcaku[1], C. Todhe[1], Y. Ibrahimllari[2]

[1]Rheumatology Dept., Mother Theresa Univ. Center, [2]Radiology Dept., Salus Hospital, Tirana, Albania

The COVID-19 pandemic, widely regarded as one of the most significant global health crises of the modern era, has led to various medical complications that have yet to be fully comprehended by healthcare practitioners. Sepsis and the complications resulting from the widespread use of medications such as corticosteroids, antibiotics, etc. are among the most critical outcomes of this condition. One of the rarer complications associated with this illness is femoral head avascular necrosis, which is generally marked by intense pain and elevated inflammatory markers. It is brought on by high doses and prolonged use of corticosteroids.
Case report: This report describes a male patient, age 24, who was referred to our emergency room complaining of significant hip discomfort that persisted even at rest with restricted range of motion. He initially just mentioned that he had a severe lung infection with Sars-COVID-19 six months prior, and that he had received long-term therapy with high doses of cortisone and antibiotics. During the radiology examination, the MRI revealed alternating signals at the bilateral symphyses pubis sights and at the proximal femur sight, which were identified as necrotic areas. Additionally, a diminution in the middle region of the corpus vertebral was noted. Afterwards, based in part on the laboratory tests, we requested a thorough anamnesis, and he disclosed that he had had drepanocitosis since the age of 6. Due to a differential diagnosis, we also had to involve the hematology unit at this point. We were now faced with the dilemma of whether femoral avascular necrosis resulted from high, persistent cortisone dosages or from hematological problems.
Conclusion: The risk of femoral head avascular necrosis can be raised by both conditions, including high dosages of cortisone and drepatocitosis. Prolonged high dosages of cortisone use during the COVID-19 pandemic may have caused many complications, including avascular necrosis of the femur head. We need to proceed with vigilance when taking the anamnesis, though, as it may help us determine the best possible course of approach.

P1020
AMOUNT OF CERULOPLASMIN, ITS BIOCHEMICAL AND IMMUNOLOGIC ACTIVITY IN PATIENTS WITH RHEUMATOID ARTHRITIS

O. I. Emelianova[1], O. A. Rusanova[1], S. S. Spitsina[1], S. A. Bedina[1], A. S. Trofimenko[1]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Russian Federation, Volgograd, Russia

Objective: Production of antibodies to ceruloplasmin (CP) in rheumatoid arthritis is an issue that has not been studied well enough. We investigated improving diagnosis of rheumatoid arthritis by determination of antibodies to CP as well as its amount and enzymatic activity.
Methods: We studied the serum from 30 apparently healthy individuals, and 108 rheumatoid arthritis patients. Antibodies to CP were determined by enzyme immunoassay using immobilized granulated antigen preparations (modification by Gontar et al., 2002). The amount of CP was determined by enzyme immunoassay according to the method of I.S. Kuzmina et al. (1991) using commercial diagnostic agent manufactured by Mechnikov Research Institute for Vaccines and Sera.
Results: Enzyme immunoassay showed a mean level of CP antibodies in donor sera of 0,020 ± 0,006 optical density units. The mean value of oxidase activity and the amount of CP in healthy people was 716 ± 26,3 and 921 ± 32 ng/ml, correspondingly. In the process of study we revealed a reliable increase in CP antibody count, the activity and amount of CP in patients with rheumatoid arthritis while in all cases the parameters under study correlated with the degree of disease activity ($p < 0,05$): at activity degree I CP antibodies were 0,098 ± 0,011; CP activity was 954 ± 48,1; CP amount was 1292 ± 73,4. At activity degree II CP antibodies were 0,138 ± 0,007; CP activity was 1163 ± 39,6; CP amount was 1763 ± 69,3. At activity degree III, CP antibodies were 0,182 ± 0,015; CP activity was 1368 ± 89,5; CP amount was 1794 ± 102,8. After a course of hospital treatment was completed, we noted a reliable decrease in the activity, amount of CP and antibodies in CP.
Conclusion: Determination of CP antibodies, as well as quantitative content of CP and its oxidase activity can serve as indicators of the activity of rheumatoid arthritis, as well as an accessory criterion of the effectiveness of administered therapy.

P1021
REHABILITATION MEASURES IN OSTEOSARCOPENIA

O. M. Ignatiev[1], M. I. Turchin[1], T. O. Yermolenko[1]

[1]Odessa National Medical Univ., Odessa, Ukraine

Objective: The structural and functional state of bone and skeletal muscle tissue is a biomarker of healthy aging, and the treatment and rehabilitation of osteosarcopenia (OSP) is part of antiaging strategy. This emphasizes the clinical and social significance of OSP, the need to study this condition, risk factors, search for predictors, prevention, effective treatment and rehabilitation. The purpose of the work is to evaluate the effectiveness of using modern computerized HUBER systems in restoring postural balance in osteosarcopenia.
Methods: There were 140 postmenopausal women (56.7 ± 2.3 years old) with osteosarcopies under observation. BMD was measured using DXA. Patients received standard osteotropic therapy (metabolites of vitamin D and denosumab) and two groups were randomized in rehabilitation methods: 1 (n = 90)—a complex program on the HUBER platform with the function of biological feedback; 2 (n = 50) training according to the classic complex program on the balancing platform-hemisphere "OsportBosu" without the function of biological feedback. To assess the functional state of the locomotor apparatus, a complex of registration and processing of biosignals in vertebrology "Insight TM" was used: pain sensitivity (algometry); flexible acoustics (ROM, inclinometry); surface electromyography (EMG); thermography of back muscles (Therma); heart rate variability (HRV).
Results: All patients (100%) complained of pain in the back, in the bones of the pelvis and limbs, weakness, increased fatigue and decreased ability to work. In the groups, patients were comparable in age and BMD. The T-score was (-3.52 ± 0.54) standard deviation. Evaluation of the effectiveness of treatment showed an increase ($p < 0.05$) in the time of maintaining balance in patients of group I after 6 and 12 months by 70% compared to the same in group II. As a result of treatment, there was an improvement ($p < 0.05$) in the biomechanical and neurological condition of the spine using a set of exercises proposed on the Huber apparatus. There was also a positive trend in the data on "maintaining time balance" in patients in group 1. The results on the time of maintaining balance indicate that individual and dosed implementation of complex coordination tasks on the Huber hardware complex contributes to the preservation of the patient's coordination capabilities.
Conclusion: Rehabilitation measures using hardware biofeedback are a highly effective method of medical support for patients with osteosarcopy.

P1022
EVALUATION OF SAFETY OF BIOACTIVE CONCENTRATE OF SMALL MARINE FISH IN SENILE PATIENTS WITH KNEE OSTEOARTHRITIS AND HIGH COMORBIDITY RATES

O. Malyshenko[1], M. Koroleva[1], M. Letaeva[1], J. Averkieva[1], T. Raskina[1]

[1]Kemerovo State Medical Univ., Kemerovo, Russia

Objective: To evaluate the safety of bioactive concentrate of small marine fish (BCSSF) in elderly patients with osteoarthritis of the knee joint and high comorbidity.
Methods: The study included 20 patients with knee joint OA, whose average age was 77.6 (75.8; 80.5) y. Patients received injections of BCSSF daily for 1 ml intramuscularly in courses of 20 d with a 6-month interval (in total 2 courses). The effectiveness of therapy was assessed by VAS and WOMAC index, the safety of the drug was assessed based on clinical and laboratory parameters during the entire follow-up period.
Results: In elderly patients with knee joint OA, a high level of comorbidity was revealed—5.4 + 0.8 diseases. The Charlson index was 1–2 points for 2 (10.0%) patients, 3–4 points in 14 (70.0%), ≥ 5 points in 4 (20.0%). By the end of the first course of BCSSF therapy, a statistically significant decrease in the total WOMAC index and a significant reduction in VAS pain were found. The positive dynamics persisted throughout the entire observation period. Thus, the number of patients who responded to therapy with a decrease in pain in the knee joint according to VAS by 20% or more by B1 was 13 (65.0%) patients, by B2 – 12 (60.0%). A statistically significant decrease in the total WOMAC index was revealed at all visits compared with the indicators obtained when the patient was included in the study: B0—1125 ± 135.0, B1—647 ± 229.0, B2—642 ± 224.0 ($p \leq 0.001$). No serious adverse events and clinically significant changes in laboratory parameters were detected during the entire observation period.
Conclusion: The results of the study demonstrate the effectiveness of BCSSF in patients with knee joint OA and confirm the safety of its use in elderly patients with high comorbidity, which makes it possible to consider it as a first-line drug in the complex therapy of OA.

P1023
RELATIONSHIP OF SARCOPENIA AND CAROTID ATHEROSCLEROSIS IN ELDERLY MEN WITH OSTEOARTHRITIS OF THE KNEE

O. Malyshenko[1], M. Koroleva[1], M. Letaeva[1], J. Averkieva[1], T. Raskina[1]

[1]Kemerovo State Medical Univ., Kemerovo, Russia

Objective: To evaluate the association of sarcopenia and carotid atherosclerosis in elderly male patients with osteoarthritis (OA) of the knee.
Methods: The study included 36 patients (mean age 68.9 (66; 71) y) with an established diagnosis of stage II-III knee OA according to the

Kellgren-Lawrence classification. Diagnosis of sarcopenia was based on the recommendations of EWGSOP 2010 with the determination of 3 parameters: muscle strength, muscle mass and muscle function. The severity of atherosclerotic lesions of the carotid arteries was assessed using color duplex scanning with the study of intima-media thickness (IMT), the presence of atherosclerotic plaques and the degree of arterial stenosis. A comparative analysis was carried out in 3 groups: 1st – 10 patients without sarcopenia, 2nd – 12 patients with presarcopenia, and 3rd – 14 patients with sarcopenia.

Results: IMT in the group of patients with sarcopenia was statistically significantly ($p = 0.005$) greater than the same indicator in men without sarcopenia. The majority of patients included in the study (63.9%) had atherosclerotic lesions of the carotid arteries. The most severe damage to the carotid arteries with multiple atherosclerotic plaques and stenosis of 50% or more was significantly more often determined in patients with sarcopenia—35.7% compared to the group of patients with presarcopenia (8.3%, $p = 0.015$) and without sarcopenia (10.0%, $p = 0.013$). According to the results of the correlation analysis, a significant negative relationship was established between the severity of carotid atherosclerosis and the musculoskeletal index ($r = -0.227$, $p = 0.047$).

Conclusion: The relationship between carotid atherosclerosis and body composition disorders in men with knee OA allows us to discuss atherosclerosis and sarcopenia as two conditions that have common pathogenetic mechanisms and potentially increase the risk of adverse outcomes.

P1024
EXPLORING THE IMPACT OF CONSERVATIVE TREATMENT ON QUALITY OF LIFE IN ADOLESCENTS WITH ADOLESCENT IDIOPATHIC SCOLIOSIS

O. Mohamed Fathy Kamal[1], C. Cuenca González[2], Y. Labrada Rodríguez[3], L. Garvin Ocampos[2], L. Monleón Llorente[2], M.-E. Cuadra Madrid[1]

[1]Dept. of Physical Medicine and Rehabilitation, Hospital Central de la Defensa, [2]Dept. of Physical Medicine and Rehabilitation, Hospital Clínico San Carlos, [3]Hospital de Guadarrama, Madrid, Spain

Objective: In the management of adolescent idiopathic scoliosis (AIS), the consideration of patients' quality of life (QoL) is often overlooked as a primary treatment goal. Assessing QoL presents a challenge for healthcare professionals, emphasizing the need to incorporate this parameter for optimal clinical practice. The primary objective of this investigation was to assess QoL, utilizing the SRS 22 questionnaire, in adolescents undergoing conservative treatment for AIS.

Methods: This study employed a descriptive retrospective design conducted within the Ortho-prothesis Unit, spanning from January 2019 to May 2020. Forty adolescents meeting inclusion and exclusion criteria, undergoing conservative treatment for AIS, were enrolled. Analyzed parameters included age, sex, Cobb angle, daily/night brace usage, brace type, and QoL assessed through the SRS 22 questionnaire. Telephone-based SRS 22 questionnaires were administered, while additional variables were extracted from clinical histories.

Results: Cobb angles ranged from 20–29° in 37.5% of patients and 30–39° in another 37.5%. Predominant brace types included Cheneau and Providence. Patients exhibited lower scores in self-image perception and mental health domains. The brace treatment group demonstrated poorer outcomes in self-image perception and mental health compared to the non-braced group (p 0.006 and p 0.04, respectively). Overall SRS 22 questionnaire scores were worse in patients with a greater angle of deviation (p 0.019). No statistically significant correlations were identified between QoL and variables such as sex, daily/night brace usage, and type of brace.

Conclusion: AIS adversely affects patients' quality of life, particularly in the domains of body image and mental health. The extent of this impact correlates with a greater angle of deviation and the decision to use or not use a brace.

P1025
EFFECTS OF ZOLEDRONIC ACID IN MEN WITH STEROID-INDUCED OSTEOPOROSIS AND INFLAMMATORY JOINT DISEASE

O. Mytrokhina[1]

[1]Dnipro State Medical Univ., Dnipro, Ukraine

Objective: Long-term use of glucocorticoids causes decreased bone mass and an increased risk of fractures. However, osteoporosis is more common in women than in men and is often considered as women's disease. However, in recent years the number of fractures in men has increased. Prevention and treatment of osteoporosis in men with long-term therapy with glucocorticoids remains an actual issue. The role of zoledronic acid in the treatment of steroid-induced osteoporosis in men with inflammatory joint diseases remains debatable. We aimed to evaluate the effects of zoledronic acid for steroid-induced osteoporosis in men with inflammatory joints disease.

Methods: 40 patients (mean age 58,30 ± 4,76 y) with inflammatory joints disease were enrolled. All patients were men and received glucocorticoid during > 5 y (mean duration of treatment 3,80 ± 0,67 y). Men had osteoporosis documented by either a lumbar spine T-score ≤ –2.5 or lumbar spine T-score ≤ –1.5 with 2 mild or 1 moderate prevalent vertebral fracture. 20 (50%) patients received the standard treatment and zoledronic acid 5 mg infusion once a year (1 group), while 20 (50%) (2 group) received only the standard treatment during 3 y. BMD, visual analog scale (VAS) were performed in all patients at baseline and at the end of the study.

Results: BMD and VAS did not differ significantly between the groups. After 3 y of treatment with zoledronic acid the incidence of symptoms, including arthralgia were significantly lower in the 1 group in compare with the 2 group ($P = 0.01$). The increase of BMD was greater in the 1 group than in the 2 group ($P = 0.05$). During 3 y among patients in the 2 group 35% have compression fractures in compare with the 1 group ($P = 0.01$).

Conclusion: Zoledronic acid is effective and safe for men with glucocorticoid-induced osteoporosis with inflammatory joints disease. Its use may provide benefits for the reduction of hospitalizations and mortality in its category of patients.

P1026
BONE MINERAL DENSITY, TRABECULAR BONE SCORE, SALT TRANSPORT IN PATIENTS WITH KIDNEY STONE DISEASES

O. Nishkumay[1], O. Nikitin[1], A. Korytskyi[2], I. Kordubailo[2], M. Chan[3], M. Wong[3]

[1]Bogomolets National Medical Univ., Kyiv, Ukraine, [2]Kyiv Regional Clinical Hospital, Kyiv, Ukraine, [3]European Wellness Academy, Edenkoben, Germany

Objective: Osteoporosis (OP)-decreased BMD, takes the leading place in the structure of morbidity and mortality. Among the main risk factors of OP is not adequate daily calcium intake. The global calcium map shows that many countries have low average levels of calcium intake. The fear of both patients and doctors regarding possible side effects, such as kidney stone diseases (KSD) is one of the main reasons for low calcium intake. The research aimed to conduct a

comparative assessment of the BMD and TBS, salt transport analysis in patients depending on KSD.

Methods: The study was conducted based on the Urology Department of the Bogomolets National Medical University, Department of Urology, "Kyiv Regional Clinical Hospital". To qualitatively assess crystalluria, a study of salt transport was carried out. Assessment of BMD was carried out by DXA (Hologic Discovery), using the ISCD-2019 criteria to divide the examinees into groups (osteoporosis, osteopenia, normal). The TBS iNsight method was used to assess the bone tissue quality indicator (TBS). The study included 80 patients, 15 men (18.8%) and 65 women (81.3%). Patients were divided depending on the presence of KSD. The I group included 32 participants without KSD (women—31 (96.9%), men—1 (3.1%), median age 63.2 [58.8–67.4] y). The II group included 48 patients with KSD (women—34 (70.8%)), men—14 (29.2%), average age 55.5 y [51.5–62.5]).

Results: There was no established difference amount of percentage normal, osteopenia, and osteoporosis between groups, as there was no difference between BMD indicators. However, the TBS index was significantly lower in patients with KSD ($p < 0.05$). In patients with KSD, the level of oxalate excretion exceeded both the reference norm and the dates of patients without nephrolithiasis ($p < 0.01$).

Conclusion: In patients with KSD was revealed decreased TBS and oxalaturia. Since a decrease in the TBS index even with a normal BMD is also an increased risk factor for bone fractures, it is extremely important for patients to conduct a correlational analysis of risk factors in a group of patients with nephrolithiasis.

P1027
COMPARATIVE ANALYSIS OF BONE LOSS IN PATIENTS WITH EROSIVE AND NON-EROSIVE HAND OSTEOARTHRITIS: A 5-YEAR LONGITUDINAL STUDY

O. Ruzickova[1], K. Pavelka[2], O. Sleglova[2], L. Senolt[2]

[1]Institute of Research in Rheumatology, [2]Institution of Research in Rheumatology, Prague, Czech Republic

Objective: Hand osteoarthritis (OA) and its more severe subset erosive hand OA are common causes of pain and morbidity. Some metabolic factors were suggested to be implicated in erosive disease. Few studies investigated differences in systemic bone loss between erosive and non-erosive hand OA. We aimed to compare the change of BMD between patients with erosive and non-erosive hand OA in a 5-y longitudinal study.

Methods: Consecutive patients with symptomatic HOA fulfilling the ACR criteria were included in this study. Erosive hand OA was defined by at least one erosive interphalangeal joint. All patients underwent clinical assessments of joint swelling and radiographs of both hands (Table 1). DXA examination of lumbar spine, total femur and femur neck was performed at the baseline, after 2 y and after 5 y. The data were adjusted for gender, comorbidities such as diabetes mellitus and dyslipidemia.

Table 1.

Characteristic		Non-erosive HOA (n=50)	Erosive HOA (n=62)	p-value
Age	Mean (SD)	63.7 (7.4)	66.6 (8.3)	0,057
Gender	Female (%)	45 (90.0)	57 (91.9)	0,981
BMI	Mean (SD)	26.7 (3.6)	28.2 (4.4)	0,051

Results: Altogether, 112 patients (10 male) with symptomatic nodal HOA were included in this study and followed between April 2012 and January 2018. Out of these patients, 62 had erosive disease after 5 y. The disease duration ($p < 0.01$) was significantly higher in patients with erosive compared with non-erosive disease at baseline. There was no difference in T-score (SD) and BMD (g/cm^2) between erosive and non-erosive hand OA at baseline, after two and after 5 y (Tables 2,3,4).

Table 2.

	Baseline (N=112)	24 months (N=112)	60 months (N=112)
T-score L spine			
Erosive, Mean (SD)	-0.973 (1.76)	-1.05 (1.48)	-1.12 (1.49)
Non-erosive, Mean (SD)	-0.522 (1.37)	-0.472 (1.64)	-0.613 (1.66)
Overall, Mean (SD)	-0.771 (1.60)	-0.806 (1.57)	-0.908 (1.57)
L spine bone density (g/cm^2)			
Erosive, Mean (SD)	1.05 (0.210)	1.05 (0.183)	1.04 (0.185)
Non-erosive, Mean (SD)	1.11 (0.163)	1.12 (0.206)	1.10 (0.209)
Overall, Mean (SD)	1.08 (0.192)	1.08 (0.195)	1.07 (0.197)
T-score of total femur			
Erosive, Mean (SD)	-0.671 (0.978)	-0.726 (0.978)	-0.850 (0.947)
Non-erosive, Mean (SD)	-0.362 (0.968)	-0.306 (1.11)	-0.430 (1.14)
Overall, Mean (SD)	-0.533 (0.981)	-0.550 (1.05)	-0.674 (1.05)
Total femoral bone density (g/cm^2)			
Erosive, Mean (SD)	0.918 (0.157)	0.922 (0.130)	0.901 (0.122)
Non-erosive, Mean (SD)	0.969 (0.139)	0.975 (0.148)	0.957 (0.151)
Overall, Mean (SD)	0.941 (0.151)	0.944 (0.139)	0.925 (0.137)
T-score of femoral neck			
Erosive, Mean (SD)	-1.17 (0.805)	-1.06 (0.922)	-1.10 (0.930)
Non-erosive, Mean (SD)	-0.874 (0.879)	-0.683 (0.948)	-0.760 (1.06)
Overall, Mean (SD)	-1.04 (0.848)	-0.904 (0.948)	-0.958 (0.994)
Femoral neck bone density (g/cm^2)			
Erosive, Mean (SD)	0.877 (0.110)	0.864 (0.110)	0.853 (0.115)
Non-erosive, Mean (SD)	0.919 (0.127)	0.917 (0.129)	0.898 (0.138)
Overall, Mean (SD)	0.896 (0.119)	0.887 (0.121)	0.872 (0.127)

Table 3.

DXA features	P-value
T-score L spine	0,08
L spine bone density (g/cm^2)	0,054
T-score of total femur	0,103
Total femoral bone density (g/cm^2)	0,057
T-score of femoral neck	0,083
Femoral neck bone density (g/cm^2)	0,076

ANOVA-computed p-values from linear mixed-effect models

Table 3.

DXA features	Contrast at	Difference between erosive and nonerosive	Adjusted p-value
T-score L spine	Baseline	-0,379	0,367
	2 years after	-0,461	0,22
	Five years after	-0,421	0,289
L spine bone density (g/cm^2)	Baseline	-0,05	0,261
	Two years after	-0,06	0,143
	Five years after	-0,053	0,228
T-score of total femur	Baseline	-0,247	0,229
	Two years after	-0,216	0,357
	Five years after	-0,191	0,46
Total femoral bone density (g/cm^2)	Baseline	-0,047	0,069
	Two years after	-0,032	0,348
	Five years after	-0,029	0,415
T-score of femoral neck	Baseline	-0,301	0,153
	Two years after	-0,222	0,412
	Five years after	-0,213	0,446
Femoral neck bone density (g/cm^2)	Baseline	-0,039	0,072
	Two years after	-0,027	0,34
	Five years after	-0,018	0,658

Contrasts were computed from linear mixed-effect models
Results are averaged over the levels of: gender, comorbid_diabetes_mellitus, comorbid_hypercholesterolemia
Degrees-of-freedom method: Kenward-Roger
P value adjustment: Sidak method for 3 tests

Conclusion: We found no differences in systemic bone loss between erosive and non-erosive hand OA over period of 5 y.

Acknowledgement: This work was supported by the project AZV no. 18–00542 and MHCR No. 023728.

P1028
QUESTION THE DENSITY AS A BONE STRENGTH MEASUREMENT

A. Akhmetzyanova[1], K. Sharafutdinova[1], D. Sabirova[1], M. Baltin[1], O. Gerasimov[1], T. Baltina[1], O. Sachenkov[1]

[1]Kazan Federal Univ., Kazan, Russia

Objective: To evaluate the effect of complete spinal cord injury (cSCI) and incomplete spinal cord injury (iSCI) on the mechanical properties of bones in experimental rats: density, ultimate strength, Young's modulus of the bone tissue of the tibia and femur.

Methods: The research was conducted using the non-pedigree rats weighing 180–200 g. iSCI was introduced between Th8-Th9 levels using the modified A.R. Allen method by 2.5 g load weighing falling vertically from 5 cm height [1]. cSCI was performed by section between Th8- Th9 segments [2]. Three-point bending tests were carried out to determine the mechanical parameters [3].

Results: In the study geometric, mass and mechanical properties of the femur and tibia were measured. Both types of spinal cord injury lead to a decrease in the bone strength. cSCI results in a reduction in the rat femur strength. The Young's modulus and density of the rat femur and tibia remain unchanged in both types of spinal cord injury.

Conclusion: It is necessary to create new clinical diagnostic techniques that can accurately evaluate the strength of bone tissue in individuals with cSCI. The research also highlights the elevated risk faced by patients with iSCI, as they experience a significant decrease in bone strength that cannot be distinguished through density measurements alone.

References:

1. Allen AR. Nerv Ment Dis 1998;31:141
2. Baltin M, et al. Biomedicines 2023;11:2026
3. Akhmetzyanova A, et al. Russ J Biomech 2022;4:38

Acknowledgment: The research was funded by the subsidy allocated to Kazan Federal University for the state assignment in the sphere of scientific activities, project No. FZSM-2023–0009.

P1029
AGE FEATURES IN CLINICAL MANIFESTATIONS OF ANKYLOSING SPONDYLITIS IN MILITARY SERVICEMEN

O. Kuryata[1], O. Sirenko[1], M. Grechanyk[1]

[1]Dnipro State Medical Univ., Dnipro, Ukraine

Objective: A substantial fraction of Ukrainian military service members with ankylosing spondylitis (AS) continued in service. However, the doubling in risk of discharge for AS is comparable to that for personnel with diabetes mellitus. The early diagnosis of AS taking into account age features can improve the efficiency of military servicemen rehabilitation. Aim of the study is to investigate the clinical manifestations, and age features of pain syndrome in Ukrainian military servicemen with AS before treatment onset.

Methods: We retrospectively studied the AS cases recorded from March 2022 to June 2023 of the rheumatology department of the largest Regional Clinical Hospital in Dnipro (Ukraine); the diagnosis was based on the ASAS-EULAR recommendations for AS. A total of 38 AS cases were diagnosed among 72 military servicemen (median age 36.7 [26.2;48.7]). The first group consisted of 15 patients aged 25–35 y, the second—23 patients aged 36–50 y.

Results: All the patients had chronic back pain. 30 (79%, 95% C.I. 77–85%) patients presented sacroiliitis of whom 21 (70%, 95% C.I. 64–76%) were bilateral. 29 military servicemen (76%, 95% C.I. 68–81%) had peripheral joint involvement. Among the patients of the first group, the peripheral joint involvement is established significantly more often – 12 (80%, 95% C.I. 72–85%) against 17 (59%, 95% C.I. 54–66%) in second group ($p < 0.05$). Four patients presented with anterior uveitis (10%, 95% C.I. 7–13%) and all were 25–35 years old. HLA-B27 antigen was found in 36 patients (95%, 95% C.I. 88–97%). Median pain intense based on VAS score was 8.8 [6.9; 9.5] in the first group, while in the second group this indicator was significantly lower 6.5 [5.7; 7.8] ($p < 0.05$). Median CRP level was 10.2 [6.2; 12.4] in the first group, in the second group—9.1 [5.8; 11.8] ($p > 0.05$).

Conclusion: Young military servicemen with ankylosing spondylitis presented significantly more frequent peripheral form and more intense pain syndrome, which must be taken into account during the rehabilitation of these patients.

P1030
FRACTURE RISK ASSESSMENT, BODY MASS INDEX AND INFLAMMATION IN PATIENTS WITH ARTERIAL HYPERTENSION AND CHRONIC PAIN IN MUSCULOSKELETAL DISEASES

O. Kuryata[1], O. Sirenko[1], M. Grechanyk[1]

[1]Dnipro State Medical Univ., Dnipro, Ukraine

Objective: The fracture risk assessment (FRAX®) algorithms are the most widely used clinical tools for the calculation of fracture risk. It is widely recognised that the calculation could be refined by more granular data about existing risk factors (e.g., glucocorticoid dose, number of prior fractures, recency of fracture etc.) or by inclusion of additional risk factors (e.g., falls, type 2 diabetes). Musculoskeletal disorders are the leading cause of disability worldwide and represent a growing problem due to the ageing population. For example, back pain, which has been reported to be the leading cause of disability in

both high-income and developing countries, results in an increased fear of pain in the elderly population. FRAX is an algorithm for fracture risk assessment useful for the primary prevention of osteoporosis, albeit it might present some limitations. Therefore, aim of our study was to evaluate the role of BMI and BP in correlation with FRAX to predict fragility fractures in patients with arterial hypertension and chronic pain in musculoskeletal diseases. We aimed to compare the relationship FRAX score, BMI and erythrocyte sedimentation rate (ESR) in patients with arterial hypertension and chronic pain in musculoskeletal diseases.

Methods: We studied 48 patients with arterial hypertension in combination with chronic pain in musculoskeletal diseases mean age 54,8 ± 5,04 (group A) and 42 patients with arterial hypertension without chronic pain in musculoskeletal diseases mean age 52,6 ± 4,7 (group B). Patients never treated with anti-osteoporotic drugs. The 10-y hip fracture risk was calculated with FRAX score and a value ≥ 2.5% signified an increased risk. Statistical significance was set at $p < 0.05$.

Results: FRAX score in a group A was higher (5,68 ± 4,1) than in group B (2,4 ± 2,1) ($p < 0,05$). The mean level of BMI: 29,3 ± 4,4 kg/m^2 in group A, 27,1 ± 2,5 kg/m^2 in a group B ($p < 0,05$). According to FRAX score, value ≥ 2.5% was found in 45 patients (93%) in a group A and in 20 patients (44%) in a group B ($p < 0,05$). There was correlation between the FRAX, weight ($r = 0,43$; $p < 0,05$), BMI ($r = -0,41$; $p < 0,05$) and ESR ($r = 0,47$; $p < 0,05$) in a group A however in a group B such connection was not observed. The mean level systolic blood pressure (BP) in a group A was higher (150,2 ± 5,8 mm Hg) than in group B (131,3 ± 4,4) ($p < 0,05$). The mean level diastolic BP changes did not significantly differ between the two groups (93,4 ± 8,4 mm Hg and 93,8 ± 6,4 mm Hg, $p = 0,54$). The level of systolic BP in a group A associated with FRAX score ($r = -0,40$; $p < 0,05$) than in group B.

Conclusion: Risk of fracture is increased in patients with arterial hypertension and chronic pain in musculoskeletal diseases. FRAX score in a group A was higher than in group B. There was correlation between FRAX score, BMI and ESR in patients with arterial hypertension and chronic pain in musculoskeletal diseases.

P1031
A BIBLIOMETRIC ANALYSIS OF SCIENTIFIC PUBLICATIONS IN THE FIELD OF THE EFFECT OF HYPOGLYCEMIC AGENTS ON BONE HEALTH

O. Tabatabaei-Malazy[1], B. Larijani[1]

[1]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Numerous studies are assessed the effect of anti-diabetic drugs on bone health. We aimed to conduct a bibliometric analysis of the scientific outputs in this field to identify the publication trend, productive country and institutions, active researchers, the journals involved, and the most popular research topics.

Methods: We carried out a bibliometric study by a comprehensive search in Scopus web database up to 4 Jan 2024. After excluding unrelated scientific papers, bibliometric metrics were extracted from the remaining papers by "analyze results", and "citation reports" tools available in Scopus, and VOSviewer 1.6.20.

Results: Within 3860 records, 532 studies were related to this topic. A time trend increasing was shown in publications with the highest number in 2022 (n = 53, 9.96%). Main type of the papers was original articles (n = 310, 8358.27%). Top three productive countries were the US (n = 151, 28.38%), China (n = 86, 16. 17%), and the UK (n = 54, 10.15%). The majority of the published papers belonged to "Osteoporos Int" (n = 20, 3.76%), "J Clin Endocrinol Metab" (n = 16, 3.01%), and "Diabetes Obes Metab" (n = 14, 2.63%). The total citation number, and H-index of 532 articles were 21,572, and 73, respectively. The highest cited paper (787) was a randomized controlled trial entitled "Pioglitazone after ischemic stroke or transient ischemic attack", published in "N Engl J Med". Top three ranked institutes in producing these documents were Steno Diabetes Center Copenhagen, Denmark (n = 17, 3.20%), followed by Universiteit Maastricht (n = 15, 2.82%) Netherlands, Aarhus Universitets hospital (n = 15, 2.82%), Denmark, and then Aalborg Universitets hospital (n = 14, 2.63%), Denmark. Top author was P Vestergaard from Denmark. Out of the 883 keywords, the top keywords included "diabetes", "osteoporosis", "metformin" and "fracture".

Conclusion: There is a large research output in the field of anti-diabetic agents and bone. We found a good position for the US as top productive country, Denmark due to its prominent authors, and institutes and "Osteoporos Int" as notable journal in dissemination of influential publications.

P1032
MAPPING OF THE SCIENTIFIC RESEARCH ON LINKS BETWEEN CVD AND BONE MASS IN OLD AGES: A SCIENTOMETRIC INVESTIGATION

O. Tabatabaei-Malazy[1], P. Khashayar[2], R. Atlasi[3], P. Khashayar[4], B. Larijani[1]

[1]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran, [2]School of life and Medical Sciences, Univ. of Hertfordshire, Hatfield, UK, [3]Non-Communicable Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran, [4]Ghent Univ., Dept. of Chemistry, Ghent, Belgium.

Objective: Cardiovascular disease (CVD) ranks first among chronic non-communicable diseases worldwide. With the surge noted in the elderly population globally, the prevalence of osteoporosis is also on rise, imposing a heavy burden on the society. The relationship between bone mass and CVD in older adults has become the focus of many studies. The present research aims to map the scientific research conducted on the links between CVD and bone mass in old ages.

Methods: A bibliometric study was carried out thorough a comprehensive search strategy in the Web of Science (WOS) database up to 1 Jan 2024. From 967 records, 294 studies were included in the bibliometric analysis, conducted using the WOS database analysis software and bibliometrix R-package 4.1.1. for illustration.

Results: Most publications were produced in 2020 (n = 21, 7.14%), with original (n = 258, 87.75%) followed by review articles (n = 25, 8.50%). Most of these articles were published by "Osteoporos Int" (n = 36, 12.24%), "J Bone Miner Res" (n = 21, 7.14%) and "Calcif Tissue Int" (n = 14, 4.76%), respectively. The top three productive countries were the USA (n = 85, 28.91%), China (49) and Japan (23). The top three institutes active in the field were University of California System (n = 19, 6.46%), followed by Harvard University, and University of California San Francisco with same number of publications (n = 13, 4.42%). The total citation number of these articles was 11,723, with "Zoledronic acid and clinical fractures and mortality after hip fracture" being the highest cited paper (1332 citations). This randomized, double-blind, placebo-controlled trial was published in "N Engl J Med". The top authors were JA Cauley from University of Pittsburgh and P Szulc from University of Lyon both with 8 articles (2.72%). Most articles were in the field of "Endocrinology Metabolism" (n = 116, 39.45%) and "Cardiovascular System Cardiology" (n = 38, 12.92).

Conclusion: CVD and osteoporosis are common age-related conditions associated with significant morbidity, mortality, and disability.

This article illustrates the hot topics, valuable articles, and productive authors in this research field, helping to point out the gaps and possible future collaborations.

P1033
COMPARISON OF FUNCTIONAL OUTCOME IN CKD AND NON-CKD PATIENTS FOLLOWING FEMORAL NECK FRACTURE UNDERGOING BIPOLAR HEMIARTHROPLASTY

O.-A. Phruetthiphat[1], Y. Plumarom[1], Y. Satravaha[2], P. Pinijprapa[1]

[1]Phramongkutklao Hospital, [2]Orthodontic Dept., Mahidol Univ., Bangkok, Thailand

Objective: Chronic kidney disease (CKD) is a growing global health concern, affecting an estimated 10% of the world's population. CKD is associated with a number of adverse health outcomes, including an increased risk of hip fracture. Femoral neck fracture is a common and debilitating injury, which can lead to significant loss of function and independence. Bipolar hemiarthroplasty (BHA) is a common surgical treatment for femoral neck fracture, with generally good outcomes. However, previous research has provided less data on functional outcomes related to chronic kidney disease (CKD) in femoral neck fracture compared to the abundance of data available for osteoarthritis of the hip. Purpose of this study is going to compare the functional outcome between CKD and non-CKD underwent BHA for femoral neck fracture as well as to identify the comparison between advanced CKD and nonadvanced CKD.
Methods: 438 patients over 60 years old who sustained a femoral neck fracture from low energy trauma underwent BHA were collected. All patients were classified into 2 groups based on glomerular filtration rate (GFR): those patients without chronic kidney disease [GFR at least 60 ml/min] and those patients with CKD [GFR < 60 ml/min]. We further categorized patients into nonadvanced [GFR at least 30 ml/min] and advanced CKD [GFR < 30 ml/min]. Patients' demography and comorbidities were reviewed in both groups. Femoral bone morphology was evaluated by Dorr classification including operative parameters. Harris hip score was used for assessment the functional outcome at preinjury status, and postoperative period at 1 and 2 y.
Results: According to a comparison between CKD and non-CKD groups, there was no difference in age, gender, and BMI in both groups while the ASA class was significantly different between 2 groups ($p < 0.001$). In addition, there was no difference in Dorr type, implant design, and operative parameters in both groups. However, the preinjury status, 1 y, and 2 y HHS were significantly different between both groups ($p < 0.001$, $p = 0.002$, and $p = 0.011$, respectively). A comparison between advanced and non-advanced CKD demonstrated a significant in BMI, ASA class, time to rehabilitation, and HHS. Those patients with advanced CKD were significantly higher ASA class ($p < 0.001$), longer time to rehabilitation ($p = 0.043$), and lower preinjury HHS, one year, and 2 y HHS than the nonadvanced CKD group ($p < 0.001$, $p < 0.001$, and $p = 0.002$, respectively).
Conclusion: CKD is a significant factor influencing functional outcomes in patients with femoral neck fracture treated with bipolar hemiarthroplasty. Studies consistently demonstrate poorer underlying health status and functional outcomes in CKD patients compared to their non-CKD counterparts.

P1034
BONE HEALTH IN A UTERINE CANCER SURVIVOR WITH TSH SUPPRESSIVE THERAPY

O.-C. Sima[1], A.-M. Gheorghe[1], A.-I. Trandafir[1], A. Ghemigian[2], G. Voicu[3], E. Petrova[2]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, [3]C.I. Parhon National Institute of Endocrinology, Bucharest, Romania

Bone resorption is stimulated by levothyroxine in TSH (thyroid stimulating hormone) suppressive therapy (TST), therefore decreasing BMD (1–10) We aim to introduce the bone status in a patient with a long history of TST in addition to a uterine cancer.
Case report: A 68-year-old female is admitted for bone assessment due to her medical history. She had surgical menopause at the age of 42 after total hysterectomy with bilateral adnexectomy for uterine leiomyoma (no hormonal replacement therapy) followed by the diagnosis of a squamous cell carcinoma of the uterine cervix, (treated with chemotherapy and radiotherapy 8 y ago). She also underwent total thyroidectomy for differentiated thyroid carcinoma 22 y prior, followed by TST. Previous DXA showed osteopenia: lumbar L1-L4 BMD = 1.005 g/cm^2, T-score = -1.5SD, Z-score = -1SD, femoral neck BMD = 0.888 g/cm^2, T-score = -1.1SD, Z-score = -0.3SD, total hip BMD = 1.048 g/cm^2, T-score = 0.3SD, Z-score = 0.7SD. She continued with 1000–2000 UI/d of cholecalciferol for 8 y. Currently, the thyroid panel confirms TST under 125 µg/d of levothyroxine and she has normal mineral metabolism assays, including 25-hydroxyvitamin D. Bone turnover markers are within normal range, except for formation marker osteocalcin = 10.73(15–46) ng/mL. No prevalent fracture is detected at profile spine X-ray. DXA-BMD is stationary: L1-L4 BMD = 0.916 g/cm^2, T-score = -2.1SD, Z-score = -1.3SD, femoral neck BMD = 0.862 g/cm^2, T-score = -1.0SD, Z-score = -0.1SD, total hip BMD = 1.059 g/cm^2, T-score = 0.5SD, Z-score = 1.1SD. TBS is normal of 1.431 (yet, she is known with pre-diabetes).
Conclusion: Despite several risk factors (early menopause, TST, and perhaps diabetes and a certain suppression of osteocalcin), a decision of not starting specific medication against osteoporosis was taken with serial DXA follow-up; this "wait and see" approach was based on DXA and FRAX-derivate risks (MOF of 7.9%, respectively, HF of 0.9%, adjusted for TBS of 6.8%, and 0.8%).
References:
1. Bugala NM, et al. Diagnostics 2022;12:2080
2. Bechir ES, et al. Revista de Chimie 2019;70:3515
3. Gheorghisan-Galateanu AA, et al. Acta Endocrinologica-Bucharest 2017;13:356
4. Ghemigian A, et al. Exp Ther Med 2022;23:88
5. Sandru F, et al. Rom J Military Med 2020;123:166
6. Albulescu DM, et al. Revista de Chimie 2018;69:3683
7. Popescu M, et al. Revista de Chimie 2018;69:2089
8. Tuculina MJ, et al. Exp Ther Med 2022;23:288
9. Nicola AG, et al. Diagnostics 2022;12:2168
10. Osman A, et al. Metabolites 2023;13:1192

P1035
LONG-TERM THERAPY FOR BREAST CANCER AND BONE HEALTH IMPACT: A CASE-BASED STUDY

O.-C. Sima[1], A.-I. Trandafir[1], A. Dumitrascu[2], A.-M. Gheorghe[1], E. Petrova[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology, [3]C.I. Parhon National Institute of

Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Aromatase inhibitors are listed among the therapy options for breast malignancy, especially for postmenopausal women. However, the estrogen-depriving action has a negative impact on both bone health.[1–10] We aim to introduce a patient with breast cancer and long-term treatment with anastrozole. Method: case report.

Case report: This was a 70-year-old female patient, diagnosed with breast cancer at the age of 62, for which she underwent surgery and treatment with anastrozole for 5 y. She entered spontaneous menopause at the age of 48. On the first endocrine admission, she had been following anastrozole therapy for 2 y and DXA showed osteopenia, with lumbar L1-L4 BMD = 0.983 g/cm^2, T-score = -1.6SD, Z-score = -0.7SD, femoral neck BMD = 0.825 g/cm^2, T-score = -1.5SD, Z-score = -0.6SD, total hip BMD = 0.913 g/cm^2, T-score = -0.8SD, Z-score = -0.1SD. Treatment with alendronate 70 mg/week was initiated (in addition to 2000 UI/d cholecalciferol) which she followed for almost 4 y She voluntarily stopped anti-resorptive medication for one more year (amid COVID-19 pandemic regulations). However (after her 5-y anastrozole regime was stopped) DXA remained within normal limits: L1-L4 BMD = 1.166 g/cm^2, T-score = -0.2SD, Z-score = 0.9SD, femoral neck BMD = 0.896 g/cm^2, T-score = -0.9 SD, Z-score = 0.1SD, as well as the bone turnover markers (BTM): osteocalcin = 19.92 ng/mL (normal:15–46), alkaline phosphatase = 53 U/L (normal:40–150), P1NP = 39.58 ng/mL (normal:20.25–76.31), and CrossLaps = 0.3 ng/mL (normal:0.3–0.782), respectively, the phosphorus-calcium metabolism assays, except for a mild vitamin D deficiency: 25-hydroxyvitamin D of 24.42 ng/mL (normal $>$ 30), but without secondary hyperparathyroidism: parathormone of 38.04 pg/mL (normal:15–65). She had no prevalent fragility fracture. Drug holiday was decided to continue under surveillance based on periodical DXA check-up in addition to vitamin D replacement.

Conclusion: Patients with breast malignancy and aromatase inhibitor therapy are highly predisposed to bone mass loss. However, a good DXA and BTM response at the end of this therapy, might allow a drug holiday for anti-osteoporotic medication, as well.

References:

1. Ghemigian A, et al. Exp Ther Med 2021;22:1219
2. Bugala NM, et al. Diagnostics 2022;12:2080
3. Albulescu DM, et al. Revista de Chimie 2018;69:36,837
4. Gheorghisan-Galateanu AA, et al. JPMA 2017;67:917
5. Popescu M, et al. Diagnostics 2022;12:960
6. Tuculina MJ, et al. Exp Ther Med 2022;23:288
7. Nicola AG, et al. Diagnostics 2022;12:2168
8. Bechir ES, et al. Revista de Chimie 2019;70:3515
9. Osman A, et al. Metabolites 2023;13:1192
10. Sandru F, et al. Exp Ther Med 2021;22:756

P1036

LOW TRABECULAR BONE SCORE IN A PATIENT WITH ADRENAL TUMOR, CHRONIC KIDNEY FAILURE, AND METABOLIC SYNDROME

O.-C. Sima[1], A.-I. Trandafir[1], A.-M. Gheorghe[1], E. Petrova[2], A. Dumitrascu[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, [3]C.I. Parhon National Institute of Endocrinology, Bucharest, Romania

Bone health can be affected by a variety of conditions, including adrenal tumors-related mild/intermittent autonomous cortisol secretion (ACS) due to adrenal tumors, chronic kidney disease, and diabetes mellitus. [1–10] We aim to introduce a patient with low TBS as a tip of the iceberg for several endocrine and metabolic conditions.

Case report: This is a 79-year-old lady admitted for the evaluation of a right adrenal tumor of 2.3 cm discovered 2 years prior on an abdominal computed tomography scan (that was performed for non-specific abdominal complains). She delayed further investigations at that point due to COVID-19 pandemic circumstances. Her medical background includes high blood pressure, dyslipidemia, obesity, and cholelithiasis. On admission, baseline morning ACTH = 10.96 pg/mL(normal:3–66), and cortisol = 11.96 μg/dL (normal:4.82–19.5) were normal; post-1 mg dexamethasone test cortisol was 1.33 μg/dL (normal: $<$ 1.8), suggesting no ACS. Plasma and 24-h urinary metanephrines/normetanephrines were normal, as well as aldosterone/renin ratio, chromogranin A, and neuron specific enolase (confirming an adrenal incidentaloma). Other findings showed elevated blood glucose = 147 mg/dL (normal:83–110), glycated hemoglobinA1c = 6.2% (normal $<$ 5.9), creatinine = 1.36 mg/dL (normal:0.5–1.1), urea = 40 mg/dL (normal:22–43), and uric acid = 7.8 mg/dL (normal:2.6–6). Type 2 diabetes with renal involvement was confirmed, respectively, a mild hypovitaminosis D (25-hydroxyvitamin D of 26 ng/mL). DXA showed osteopenia: lumbar BMD = 0.923 g/cm^2, T-score = -2.4SD, Z-score = -1.7SD, femoral neck BMD = 0.793 g/cm^2, T-score = -1.6SD, Z-score = -0.5SD, total hip BMD = 0.902 g/cm^2, T-score = -0.8SD, Z-score = 0.1SD, and low TBS = 1.220. Serum bone formation markers were normal. She was recommended adequate lifestyle intervention for glucose and renal profile, uric acid and arterial hypertension lowering medication, respectively daily alphacalcidol 0.5 μg/d plus surveillance of the adrenal mass, and bone status.

Conclusion: Bone microarchitecture might be damaged in spite of a normal BMD; while solely TBS-based threshold of intervention against osteoporosis is still an open issue.

References:

1. Ghemigian A, et al. Exp Ther Med 2022;23:88
2. Sandru F, et al. Exp Ther Med 2021;22:756
3. Albulescu DM, et al. Revista de Chimie 2018;69:3683
4. Popescu M, et al. Revista de Chimie 2018;69:2089

5. Gheorghisan-Galateanu AA, et al. Acta Endocrinologica-Bucharest 2017;13:356
6. Tuculina MJ, et al. Exp Ther Med 2022;23:288
7. Bechir ES, et al. Revista de Chimie 2019;70:3515
8. Popescu AD, et al. Diagnostics 2022;12:2669
9. Osman A, et al. Metabolites 2023;13:1192
10. Bugala NM, et al. Diagnostics 2022;12:2080

P1037
REAL-LIFE-MEDICINE- BASED SAMPLE CASE OF COMPLICATED OSTEOPOROSIS

O.-C. Sima[1], A.-I. Trandafir[1], A.-M. Gheorghe[1], E. Petrova[2], A. Dumitrascu[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, [3]C.I. Parhon National Institute of Endocrinology, Bucharest, Romania

Fracture risk reduction is the focus for complicated osteoporosis, but individual response to different anti-osteoporotic drugs is the key in anti-osteoporosis management. [1–9] We aim to introduce a patient with severe osteoporosis who suffered multiple fragility fractures despite therapy.

Case report: This is a 71-year-old female who entered menopause at 50. Her medical history includes invasive lobular breast carcinoma at 66 for which she received neoadjuvant chemotherapy and tamoxifen for 2 y after mammary surgery. She was diagnosed with osteoporosis since the age of 53 and treated with bisphosphonates for 8 y, suffering multiple fragility fractures despite being compliant. Then daily teriparatide was followed for 2 y and continued with denosumab for 1 y when the patient decided the stop any medication for 1 y. At that point, the mammary malignancy was detected and treated until achieving remission. Hence, she came back for a bone assessment only after another 3 y while being in drug holiday. DXA showed osteoporosis, but better scores than before: L2-L3 BMD = 0.815 g/cm^2, T-score = -3.2SD, Z-score = -1.5SD, femoral neck BMD = 0.821 g/cm^2, T-score = -1.6SD, Z-score = 0.1SD, total hip BMD = 0.843 g/cm^2, T-score = -1.3SD, Z-score = 0.1SD. Zoledronate 5 mg was administered and vitamin D supplementation. After 1 y, DXA reveals osteopenia scores: L1-L4 BMD = 0.903 g/cm^2, T-score = -2.3SD, Z-score = -1.0SD, femoral neck BMD = 0.831 g/cm^2, T-score = -1.2SD, Z-score = 0.1SD, total hip BMD = 0.816 g/cm^2, T-score = -1.5SD, Z-score = -0.5SD, a mildly reduced TBS = 1.252, and suppressed bone turnover markers: osteocalcin = 14.32 ng/mL (normal:15–46), alkaline phosphatase = 31 U/L (normal:40–150), P1NP = 27.7 ng/mL (normal:14.28–58.92), and CrossLaps = 0.12 ng/mL (0.33–0.782). No new fracture was found at screening X-ray. She was recommended to continue with further vitamin D supplementation and periodical follow-up since redo of zoledronate might be postponed up to 36 months.

Conclusion: The particular aspects of this sample case are: multiple fractures despite adequate therapy, followed by an otherwise good response to 3-y anti-osteoporotic treatment gap having denosumab as the last drug before self-decision of drug holiday.

References:

1. Popescu M, et al. Rom J Morphol Embryol 2022;63:39
2. Tuculina MJ, et al. Exp Ther Med 2022;23:288
3. Bugala NM, et al. Diagnostics 2022;12:2080
4. Osman A, et al. Metabolites 2023;13:1192
5. Nicola AG, et al. Diagnostics 2022;12:2168
6. Trandafir AI, et al. J Clin Med 2023;12:7399
7. Popescu AD, et al. Diagnostics 2022;12:2669
8. Bechir ES, et al. Revista de Chimie 2018;69:3565
9. Popescu M, et al. Diagnostics 2022;12:960

P1038
DECISION OF DRUG HOLIDAY FOR A PATIENT WITH PRIMARY HYPERPARATHYROIDISM-RELATED MULTIPLE FRAGILITY FRACTURES

O.-C. Sima[1], D.-E. Rentea[2], A.-I. Trandafir[1], A.-M. Gheorghe[1], E. Petrova[3]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & C.I. Parhon National Institute of Endocrinology, [2]C.I. Parhon National Institute of Endocrinology, [3]C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Primary hyperparathyroidism(PHP)-related osteoporosis involves different challenges during post-operatory follow-up across a large period of time amid menopause; step-by-step decision of anti-osteoporotic medication should be taken due to increasing years since menopause and aging despite blood PTH correction.[1–6] We introduce a patient who suffered multiple fragility fractures caused by PHP complicated with severe osteoporosis.

Case report: This is a 72-year-old female patient, admitted for bone status evaluation. She has a history of PHP and 5 fragility fractures that occurred before the actual diagnosis of PHP requiring 1-y apart two times parathyroidectomy due to asynchronous bilateral parathyroid tumors (without a genetic background). After surgery, lowest T-score at central DXA was at lumbar spine (-2.8); she was treated with zoledronate 5 mg IV for 3 y, followed by 1 y of ibandronate IV, at the end of which DXA improved (in addition to post-surgery PTH correction following the second intervention) lumbar L1-L4 BMD of 0.911 g/cm^2, T-score of -2.2, Z-score of -1.3; femoral neck BMD of 0.754 g/cm^2, T-score of -2, Z-score of -1; total hip BMD of 0.876 g/cm^2, T-score of -1, Z-score of -0.3; and third distal radius BMD of 0.537 g/cm^2, T-score of -2.5, Z-score of -1.4. 5 mg zoledronate IV was administered once again with 12-month DXA results showing a further improvement; hence a drug holiday was decided. After 8 y of drug holiday (under close surveillance), DXA revealed an additional increase of BMD as follows: L1-L4 BMD of 0.962 g/cm^2, T-score of -1.8, Z-score of -0.6; femoral neck BMD of 0.778 g/cm^2, T-score of -1.7, Z-score of -0.4; total hip BMD of 0.938 g/cm^2, T-score of -0.5, Z-score of 0.5; and third distal radius BMD of 0.704 g/cm^2, T-score of -2, Z-score of 0.1. Of note, a degraded microarchitecture was identified based on TBS of 1.219. Since no new clinical fracture occurred, neither an asymptomatic one was identified at screening profile spine X-ray, further drug holiday was recommended.

Conclusion: Upon correction of an endocrine cause of secondary osteoporosis, despite being already complicated with fractures, a decision of bisphosphonates holyday should be taken with caution, but some patients might prove an exceptional response and no additional exposure to anti-osteoporotic regimes is needed. TBS-based decision of therapy in subjects with corrected PHP remains challenging.

References:

1. Popescu M, et al. Diagnostics 2022;12:960
2. Tuculina MJ, et al. Rom J Oral Rehab 2022;14:78
3. Popescu AD, et al. Diagnostics 2022;12:2669
4. Osman A, et al. Metabolites 2023;13:1192
5. Bechir ES, et al. Revista de Chimie 2018;69:3565
6. Trandafir AI, et al. J Clin Med 2023;12:7399

P1039
THE RIGHT SWITCH AT THE RIGHT MOMENT: IMPORTANCE OF FOLLOW-UP IN PATIENTS WITH ANTIOSTEOPOROTIC TREATMENT

O.-C. Sima[1], D.-E. Rentea[2], M. Costachescu[3], A.-I. Trandafir[1], A.-M. Gheorghe[1], E. Petrova[4]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology, [2]Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology, [3]Dept. of Radiology and Medical Imaging, Fundeni Clinical Institute, [4]Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Osteoporosis leads to bone fragility, thus increasing the risk of low trauma fractures. Whether it is due to menopause or secondary causes, a personalized approach is mandatory, particularly when deciding the switch of anti-osteoporotic drugs.[1–5] We aim to introduce a patient with a long history of treated osteoporosis and associated pitfalls.

Case report: This is a 75-year-old patient admitted for bone assays. Her personal medical history includes total thyroidectomy performed at 69 for a left follicular adenoma. She is also known with osteoporosis since the age of 64, when DXA showed lumbar L1-L4 BMD = 0.661 g/cm^2, T-score = -4.3SD, Z-score = -3.3SD. Treatment with oral weekly risedronate was followed for 5 y (with cholecalciferol 1000–2000 UI/d); however, despite compliance and no obvious new cause of bone loss, DXA confirmed a decrease in L1-L4 BMD of 0.638 g/cm^2, T-score = -4.5SD, Z-score = -3.4SD, and L1, L2, L3 vertebral fractures were discovered on X-ray. Therefore, a switch to teriparatide 20 mg/d subcutaneously was done. After 2 y, DXA improved: L1-L4 BMD = 0.781 g/cm^2, T-score = -3.3SD, Z-score = -1.9SD without novel fractures. IV ibandronate was administered every 3 months for 1 y with poor BMD response, followed by denosumab 60 mg subcutaneously every 6 months for 4 y (during COVID-19 pandemic years, she was not reassessed by DXA). Currently, DXA reflects a BMD improvement: L1-L4 BMD = 0.857 g/cm^2, T-score = -2.9SD, Z-score = -1.5SD; femoral neck BMD = 0.798 g/cm^2, T-score = -1.5SD, Z-score = 0SD, total hip BMD = 0.848 g/cm^2, T-score = -1.3SD, Z-score = 0.1SD, with degraded microarchitecture as pointed by TBS of 1.220. Bone formation marker osteocalcin is slightly decreased (11.58 ng/mL, normal:15–46), while alkaline phosphatase and P1NP are normal; bone resorption marker CrossLaps is also suppressed (0.11 ng/mL, normal:0.33–0.782). A decision of further continuing denosumab and vitamin D was established.

Conclusion: Despite no obvious causes, the patient was not responsive to bisphosphonates, but successfully finished the 2-y teriparatide protocol and continued to have stationary BMD under denosumab, thus confirming that the type of anti-resorptive drug should be individually decided and periodical follow-up is essential.

References:

1. Bechir ES, et al. Revista de Chimie 2018;69:3565
2. Osman A, et al. Metabolites 2023;13:1192
3. Popescu M, et al. Diagnostics 2022;12:960
4. Tuculina MJ, et al. Rom J Oral Rehab 2022;14:78
5. Popescu AD, et al. Diagnostics 2022;12:2669

P1040
MULTIPLE FRAGILITY FRACTURES DESPITE ANTI-OSTEOPOROSIS MEDICATION.

O.-C. Sima[1], M. Costachescu[2], A.-I. Trandafir[1], A.-M. Gheorghe[1], E. Petrova[3], L. Suveica[4]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology, Bucharest, Romania, [2]Dept. of Radiology and Medical Imaging, Fundeni Clinical Institute, Bucharest, Romania, [3]Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania, [4]Family Medicine Dept., "Nicolae Testemiţanu" State Univ. of Medicine and Pharmacy of the Republic of Moldova, Chisinau, Moldova

Low BMD may be found in patients before menopause onset and these cases represent a challenge in the daily medical practice. Periodical check-up is crucial in order to find the optimal timing of treatment initiation or drug switch when results are not adequate.[1–5] We aim to introduce a patient confirmed with a childhood musculoskeletal disorder and a long history of osteoporosis associated with multiple fragility fractures.

Case report: This was a 71-year-old female admitted for DXA scan. She has congenital dysplasia of the right hip for which surgery was performed and poliomyelitis sequelae. She entered menopause at the age of 57, but she was diagnosed with osteoporosis at 51. Treatment with alendronate was recommended for a few years, followed by risedronate until the age of 57, when she suffered multiple vertebral fractures. After this, the patient started taking oral ibandronate. This was her treatment for 7 y (of note, a metatarsal fracture occurred after 1 y after initiation). At the end of this bisphosphonates sequence, DXA showed (left) total hip BMD = 0.645 g/cm^2, T-score = -3SD, Z-score = -1.5SD, femoral neck BMD = 0.59 g/cm^2, T-score = -3.3SD, Z-score = -1.5SD. A switch to teriparatide was offered to the lady; yet, early after initiation, she complained at local accuses after subcutaneous injection and refused to continue it, neither she continued with another drug against osteoporosis and did not come back for another evaluation amid COVID-19 pandemic era. During this period, she had two other fractures of the right tibial malleolus and the left calcaneus. On current admission, biochemistry panel of calcium-phosphorus metabolism showed normal levels of total serum calcium, serum phosphorus, vitamin D and parathormone, as well, as bone turnover markers while DXA-BMD was stationary. A decision of injectable bisphosphonates (5 mg/y zoledronate) was done in addition to vitamin D and continuum surveillance.

Conclusion: Fragility fractures represent the main concern in osteoporotic patients; as seen in this case, long running panel of medication over the years might impact the overall compliance in one individual.

References:

1. Popescu M, et al. Rom J Morphol Embryol 2022;63:39
2. Popescu AD, et al. Diagnostics 2022;12:2669
3. Bechir ES, et al. Revista de Chimie 2018;69:3565
4. Osman A, et al. Metabolites 2023;13:1192
5. Tuculina MJ, et al. Rom J Oral Rehab 2022;14:78

P1041
SEQUENTIAL THERAPY BEFORE AND AFTER 24-MONTH DAILY TERIPARATIDE PROTOCOL FOR COMPLICATED MENOPAUSAL OSTEOPOROSIS

O.-C. Sima[1], M. Costachescu[2], E. Petrova[3], A.-M. Gheorghe[1], A.-I. Trandafir[1], L. Suveica[4]

[1]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology, Bucharest, Romania, [2]Dept. of Radiology and Medical Imaging, Fundeni Clinical Institute, Bucharest, Romania, [3]Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania, [4]Family Medicine Dept., "Nicolae Testemiţanu" State Univ. of Medicine and Pharmacy of the Republic of Moldova, Chisinau, Moldova

Menopausal osteoporosis is characterized by an imbalance between bone formation and resorption, with an increase of the latter, and teriparatide represents an anabolic agent that promotes bone formation, hence reducing the risk of osteoporotic fractures, particularly at vertebral site. [1–5] Our purpose is introducing a patient that followed a full-course 24-month teriparatide protocol, preceded and followed by bisphosphonates therapy.

Case report: This is a 59-year-old female patient admitted for a DXA control. At the age of 51, DXA confirmed osteoporosis: L1-L4 BMD = 0.878 g/cm^2, T-score = -2.5SD, Z-score = -1.8SD, femoral neck BMD = 0.766 g/cm^2, T-score = -2SD, Z-score = -1SD, total hip BMD = 0.758 g/cm^2, T-score = -2SD, Z-score = -1.3SD. She started oral weekly risedronate which she followed for 3 y before suffering a single vertebra fracture. After this, teriparatide was initiated and at the end of the 2-y therapy, DXA showed increased L1-L3 BMD = 0.955 g/cm^2, T-score = -1.8SD, Z-score = -0.9SD, femoral neck BMD = 0.786 g/cm^2, T-score = -1.8SD, Z-score = -0.8SD, total hip BMD = 0.792 g/cm^2, T-score = -1.7SD, Z-score = -1SD, and the management was continued with anti-resorptive treatment. Currently, after another 3 y of intravenous ibandronate, DXA reveals no further bone loss (in addition to lack of any additional fracture) L1-L4 BMD = 0.941 g/cm^2, T-score = -2SD, Z-score = -0.8SD, femoral neck BMD = 0.772 g/cm^2, T-score = -1.7SD, Z-score = 0.6SD, total hip BMD = 0.804 g/cm^2, T-score = -1.6SD, Z-score = -0.8SD. A normal bone microarchitecture is confirmed by TBS of 1.474. Ibandronate IV in association with vitamin D supplements was further offered to the lady as well as a recommendation of lifelong skeleton health surveillance.

Conclusion: When fragility fractures occur in osteoporotic patients that already follow anti-resorptive treatment, teriparatide is useful, however, a re-introduction of post-teriparatide bisphosphonates course is highly recommended.

References:

1. Popescu AD, et al. Diagnostics 2022;12:2669
2. Bechir ES, et al. Revista de Chimie 2018;69:3565
3. Popescu M, et al. Rom J Morphol Embryol 2022;63:39
4. Osman A, et al. Metabolites 2023;13:1192
5. Tuculina MJ, et al. Rom J Oral Rehab 2022;14:78

P1042
SEVERE TETANY OCCURANCE AFTER TOTAL TYROIDECTOMY FOR A BENIGN PARTIALLY RETROSTERNAL GOITER

M. Costachescu[1], E. Petrova[2], O.-C. Sima[3], A.-M. Gheorghe[3], A.-I. Trandafir[3], D. Ioachim[4]

[1]Dept. of Radiology and Medical Imaging, Fundeni Clinical Institute, [2]Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, [3]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology, [4]Dept. of Pathology, C.I. Parhon National Institute of Endocrinology, Bucharest, Romania

Surgical removal (or transitory lesion amid neck surgery) of the parathyroid glands can lead to severe effects, among which the implications at the level of neuromuscular and cardiac systems are the most important. Manifestations cover a large spectrum, from mild tingling paresthesia to life-threatening cardiac arrythmias. [1–5] We aim to introduce a patient with symptomatic postoperative hypocalcemia.

Case report: Mineral metabolism is explored based on total serum calcium, phosphorus, 25-hydroxyvitamin D (25OHD), PTH, and bone turnover markers of formation (osteocalcin), respective of resorption (CrossLaps). This is a 33-year-old patient admitted for postsurgical check-up after total thyroidectomy for a benign multinodular goiter. She accused tingling paresthesia in her fingers, toes and around the mouth, accompanied by muscle cramping, starting 2 d after the surgery. From her medical history we mention two pregnancies, 8 and 5 y ago, that were complicated with pre-eclampsia and at the end of the second, an increase of the pre-existent endemic goiter was registered. Currently, the thyroid panel showed an elevated TSH of 16.53 mUI/mL (normal: 0.35–4.94) under levothyroxine 150 μg daily, indicating an insufficient substitutive dose. Phosphor-calcium metabolism revealed hypocalcemia and a mild hyperphosphatemia, with a total serum calcium of 7.32 mg/dL (normal: 8.4–10.3) and phosphorus of 4.8 mg/dL (normal: 2.3–4.7). 25OHD, PTH and bone turnover markers were within normal range (low normal PTH). Levothyroxine was raised to 162.5 μg/d. After 10-d regime of 1 g/d intravenous calcium, oral calcium supplements (in addition to intermittent intravenous calcium if needed) associated with calcitriol 0.5 mg/d were initiated with close surveillance.

Conclusion: Post-thyroidectomy follow-up should focus not only on TSH and FT4 evaluation, but also on mineral metabolism and balance, especially in cases with more difficult surgery of partially mediastinal masses. Severe (symptomatic) tetany which is discordant with low-normal PTH is expected to be transitory, as seen in this sample case.

References:

1. Osman A, et al. Metabolites 2023;13:1192
2. Popescu AD, et al. Diagnostics 2022;12:2669
3. Popescu M, et al. Romanian Journal of Morphology and Embryology 2022;63:39
4. Bechir ES, et al. Revista de Chimie 2018;69:3565
5. Tuculina MJ, et al. Romanian Journal of Oral Rehabilitation 2022;14:78

P1043
REDUCING BONE RESORPTION MIGHT NOT BE ENOUGH: THE IMPORTANCE OF CONSIDERING OSTEOANABOLIC AGENTS FOR SEVERE OSTEOPOROSIS

M. Costachescu[1], A.-M. Gheorghe[2], E. Petrova[3], A.-I. Trandafir[2], O.-C. Sima[2], D. Ioachim[4]

[1]Dept. of Radiology and Medical Imaging, Fundeni Clinical Institute, [2]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology, [3]Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, [4]Dept. of Pathology, C.I. Parhon National Institute of Endocrinology, Bucharest, Romania

Osteoporosis may be treated either with anti-resorptive or bone forming agents, with an individual (personalized) decision in patients

with a long history. [1–4] We aim to introduce the sequential approach for a lady with complicated osteoporosis.

Case report: This was a 55-year-old female patient diagnosed with osteoporosis at the age of 48. She entered spontaneous menopause at 47. Her personal medical history included rheumatoid arthritis for which she had 1 year of glucocorticoid therapy at the age of 49. She was first admitted at 48, when DXA revealed L1-L4 lumbar BMD of 0.899 g/cm^2, T-score = -2.3SD, Z-score = -2SD, femoral neck BMD = 0.726 g/cm^2, T-score = -2.2SD, Z-score = -1.5SD, total hip BMD = 0.815 g/cm^2, T-score = -1.5SD, Z-score = -1.1SD. Due to high-dose corticoids, she was assessed as having high fracture risk; hence, she started treatment with oral weekly risedronate. After 2 y, DXA showed a BMD decrease: L1-L4 BMD = 0.807 g/cm^2, T-score = -3.1SD, Z-score = -2.8SD, femoral neck BMD = 0.728 g/cm^2, T-score = -2.2SD, Z-score = -1.5SD, total hip BMD = 0.772 g/cm^2, T-score = -1.9SD, Z-score = -1.4SD. In addition, thoracolumbar spine X-ray showed novel multiple vertebral fractures at thoracic level. Bone turnover markers remained within normal range. Therefore, it was decided to start teriparatide for 2 y with a good response, followed by denosumab under which DXA shows an improvement—lumbar L1-L4 BMD = 0.896 g/cm^2, T-score = -2.4SD, Z-score = -1.7SD, femoral neck BMD = 0.641 g/cm^2, T-score = -2.9SD, Z-score = -1.9SD, total hip BMD = 0.758 g/cm^2, T-score = -2.0SD, Z-score = -1.4SD. Bone formation marker osteocalcin is decreased (9.78 ng/mL, normal:15–46), P1NP is normal (17.12 ng/mL, normal:20.25–76.31) and bone resorption marker CrossLaps is also below the normal range (0.04 ng/mL, normal:0.33–0.782). She was recommended to continue denosumab therapy with 2000 UI/d cholecalciferol.

Conclusion: In this case, a good response to bone forming agent was synchronous with the massive reduction of glucocorticoids doses, but lifelong anti-osteoporosis therapy is required, despite her relatively young age for a complicated osteoporosis due to multiple vertebral fractures.

References:

1. Popescu AD, et al. Diagnostics 2022;12:2669
2. Osman A, et al. Metabolites 2023;13:1192
3. Popescu M, et al. Rom J Morphol Embryol 2022;63:39
4. Bechir ES, et al. Revista de Chimie 2018;69:3565

P1044
PITFALLS OF BISPHOSPHONATES HOLIDAY AS AN OSTEOPOROSIS APPROACH

M. Costachescu[1], E. Petrova[2], A.-I. Trandafir[3], O.-C. Sima[3], A.-M. Gheorghe[3], D. Terzea[4]

[1]Dept. of Radiology and Medical Imaging, Fundeni Clinical Institute, [2]Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, [3]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology, [4]Dept. of Pathology, C.I. Parhon National Institute of Endocrinology, Bucharest, Romania

One of the most challenging areas of treating primary osteoporosis is represented by the issue of bisphosphonates holiday. [1–8] We aim to introduce a patient who started drug holiday after antiresorptive treatment that led to important bone mass loss.

Case report: This was a 61-year-old female patient who was admitted for bone status planned checkup. Her medical history included gastro-esophageal reflux disease that associated pharyngolaryngitis. She was initially diagnosed with osteoporosis ten years ago and treated with alendronate for 2.5 y, after which she was offered a drug holiday. 4 y ago, DXA evaluation showed osteopenia and it was decided to continue the bisphosphonates holiday with 1-y reassessment. Currently, DXA confirms osteoporosis with L1-L4 BMD of 0.708 g/cm^2, T-score of -3.1 SD and Z-score of -1.8 SD, total hip BMD of 0.804 g/cm^2, T-score of -1.6 SD and Z-score of -0.8 SD and femoral neck BMD of 0.657 g/cm^2, T-score of -2.3 SD and Z-score of -1.0 SD. Moreover, a de-suppression of bone formation markers osteocalcin = 32 ng/mL (normal:15–46), alkaline phosphatase = 71 U/L (normal:40–140), P1NP = 68 ng/mL (normal:20.25–76.31) and bone resorption marker CrossLaps = 0.6 ng/mL (normal:0.33–0.782) is registered. Thus, it is decided to start intravenous ibandronate every 3 months due and vitamin D supplements.

Conclusion: No incidental fracture was associated with the lowering of BMD, however BMD changes might stand alone for restarting specific medication against osteoporosis.

References:

1. Popescu AD, et al. Diagnostics 2022;12:2669
2. Osman A, et al. Metabolites 2023;13:1192
3. Popescu M, et al. Rom J Morphol Embryol 2022;63:39
4. Bechir ES, et al. Revista de Chimie 2018;69:3565
5. Prodana M, et al. Coatings 2020;10:526
6. Ciuche A, et al. Chirurgia (Bucur) 2012;107:206
7. Tizu M, et al. J Funct Biomater 2022;13:109
8. Nistor CE, et al. J Clin Med 2019;9:76

P1045
CONSIDERATIONS ON A TRAUMATIC FRACTURE IN A FEMALE WITH PRIMARY OSTEOPOROSIS

M. Costachescu[1], A.-M. Gheorghe[2], A.-I. Trandafir[2], O.-C. Sima[2], E. Petrova[3], D. Terzea[4]

[1]Dept. of Radiology and Medical Imaging, Fundeni Clinical Institute, [2]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology, [3]Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, [4]Dept. of Pathology, C.I. Parhon National Institute of Endocrinology, Bucharest, Romania

Menopause comes with significant changes in bone mass, as the decrease in estrogenic levels causes an imbalance between formation and resorption. Primary osteoporosis can lead to high risk of fractures, having a negative impact on the life of menopausal women, but additional traumatic fracture requires an adjustment of strategy in this instance. [1–8] We aim to introduce a patient with a history of a traumatic fracture and recently-diagnosed osteoporosis.

Case report: This is a 68-year-old female patient admitted for endocrine check-up. Her medical history includes a traumatic fracture in the right humerus more than a decade ago, followed by a defect in consolidation which resulted in the shortening of the left (nondominant) arm by 10 cm. She was also diagnosed with papillary thyroid carcinoma after total thyroidectomy, for which she received radioiodine therapy (160 mCi) and TSH suppression levothyroxine therapy. Currently, the thyroid panel is within normal range, with TSH = 0.35 mIU/mL (normal:0.25–4.94) and FT4 (Free levothyroxine) of 15.2 pmol/L (normal: 9–19), under levothyroxine 100 μg/d. Thyroglobulin is 2.07 ng/mL (normal: 3.5–7.7). Total serum calcium is normal, as well as phosphorus and vitamin D levels, and bone formation markers osteocalcin = 34.49 ng/mL (normal:15–46), alkaline phosphatase = 95 (40–150) UI/L, and P1NP = 68.6 ng/mL (normal: 20.25–76.31), and resorption marker CrossLaps = 0.76 ng/mL (normal: 0.33–0.782). DXA shows L1-L3 BMD = 0.942 g/cm^2, T-score = -2 SD, Z-score = -0.4 SD, femoral neck BMD = 0.833 g/cm^2, T-score = -1.2 SD, Z-score = 0.2 SD, total hip BMD = 0.898 g/cm^2, T-score = -0.8 SD, Z-score = 0.3 SD, third distal radius BMD = 0.577 g/cm^2, T-score = -3.4SD, Z-score = -1.8 SD,

confirming osteoporosis (of note, she had normal PTH and 25-hydroxyvitamin D; we used her dominant arm because of her prior lesion). A degrade microarchitecture in terms of low TBS of 1.225 was identified. Hence, a decision of initiating oral bisphosphonates was done in addition to vitamin D supplements and a second round of radioiodine treatment.

Conclusion: DXA at third distal dominant arm in cases with non-usable data for the dominant one are less useful in daily practice. However, in this case, the presence of the lowest T-score at this site in association with other fracture risks such as TSH suppressive therapy represented major clues for initiating specific therapy against osteoporosis.

References:

1. Prodana M, et al. Coatings 2020;10:526
2. Popescu AD, et al. Diagnostics 2022;12:2669
3. Tizu M, et al. J Funct Biomater 2022;13:109
4. Osman A, et al. Metabolites 2023;13:1192
5. Popescu M, et al. Rom J Morphol Embryol 2022;63:39
6. Nistor CE, et al. J Clin Med 2019;9:76
7. Bechir ES, et al. Revista de Chimie 2018;69:3565
8. Ciuche A, et al. Chirurgia (Bucur) 2012;107:20

P1046
BONE EFFECTS AFTER 24 MONTHS SINCE SINGLE 5-MG DOSE OF ZOLEDRONATE

M. Costachescu[1], A. Goldstein[2], O.-C. Sima[3], A.-M. Gheorghe[3], A.-I. Trandafir[3], E. Petrova[4]

[1]Dept. of Radiology and Medical Imaging, Fundeni Clinical Institute, [2]Dept. of Nuclear Medicine, C.I. Parhon National Institute of Endocrinology, [3]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology, [4]Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

After menopause, the lowering levels of estrogens lead to bone fragility and increased fracture risk, an aspect that is prolonged thought the entire life span across menopausal years, thus the importance of treatment strategies that increase the patients' adherence.[1–8] We aim to introduce the 24-month bone status assessment following single zoledronate injection against osteoporosis.

Case report: This is a 78-year-old lady with osteoporosis and previous fragility fractures at ribs and distal radius that were confirmed early after entering spontaneous menopause around the age of 50. Yet, she only started anti-osteoporotic treatment at the age of 61 (weekly alendronate) which she followed for three years, then two more years of oral ibandronate and one year of alendronate (due to protocol-based reimbursement at that time). After these 6 y, central DXA showed an improvement since initial score to L1-L4 lumbar BMD = 0.784 g/cm^2, T-score = -3.2SD, Z-score = -1.9SD, femoral neck BMD = 0.790 g/cm^2, T-score = -1.8SD, Z-score = -0.4SD, total hip BMD = 0.835 g/cm^2, T-score = -1.4SD, Z-score = -0.3SD (and no incidental fractures). She decided to stop the medication against osteoporosis (except for vitamin D supplements), but came each year for a DXA and bone markers evaluation during the following 6 y. Consecutively, DXA revealed a BMD increase in terms of L1-L4 T-score = -2.8SD. Since she already had prevalence fractures (but not novel ones), 5 mg zoledronate IV were administrated with a good 24-month effect: L1-L4 BMD = 0.883 g/cm^2, T-score = -2.5SD, Z-score = -0.8SD, femoral neck BMD = 0.760 g/cm^2, T-score = -2SD, Z-score = -0.2SD, total hip BMD = 0.842 g/cm^2, T-score = -1.3SD, Z-score = 0.3SD. Subsequently, a decision of prolonging the gap to the next administration was done; it was prolonged for three more years, when BMD decreased and the therapy was re-initiated.

Conclusion: A single 5-mg dose of zoledronate may have prolonged effects more than 12 months, thus the second and even the third year since its administration may be regarded, not as bisphosphonate holiday, but as long-term effect, thus being part of a long-standing strategy that is also meant to increase the subject's compliance.

References:

1. Tizu M, et al. J Funct Biomater 2022;13:109
2. Bechir ES, et al. Revista de Chimie 2018;69:3565
3. Ciuche A, et al. Chirurgia (Bucur) 2012;107:206
4. Popescu M, et al. Rom J Morphol Embryol 2022;63:39
5. Prodana M, et al. Coatings 2020;10:526
6. Osman A, et al. Metabolites 2023;13:1192
7. Nistor CE, et al. J Clin Med 2019;9:76
8. Popescu AD, et al. Diagnostics 2022;12:2669

P1047
DELAYED LOW PTH VALUES FOLLOWING PARATHYROIDECTOMY IN A PATIENT WITH MEN2A SYNDROME

M. Costachescu[1], A. Goldstein[2], A.-M. Gheorghe[3], A.-I. Trandafir[3], O.-C. Sima[3], E. Petrova[4]

[1]Dept. of Radiology and Medical Imaging, Fundeni Clinical Institute, [2]Dept. of Nuclear Medicine, C.I. Parhon National Institute of Endocrinology, [3]PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy & Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology, [4]Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

MEN2A (multiple endocrine neoplasia type 2A) is an inherited syndrome that usually manifests through the association of medullary thyroid carcinoma, pheochromocytoma and primary hyperparathyroidism. It is diagnosed through genetic testing of the *RET* (rearranged during transfection) mutation and it is transmitted in an autosomal dominant manner. Nearly all patients develop medullary thyroid carcinoma, but the presence of pheochromocytoma and primary hyperparathyroidism varies with the specific type of mutation present. [1–10] We aim to introduce a patient with MEN2A syndrome and late-onset tetany after synchronous thyroidectomy and parathyroidectomy.

Case reports: This was a 42-year-old female patient admitted for endocrine check-up after (two times) bilateral adrenalectomy for pheochromocytoma, and synchronous total thyroidectomy for medullary thyroid carcinoma and left inferior parathyroidectomy for a parathyroid tumor. Her family medical history revealed that her mother, her sister and her first-grade cousin were also diagnosed with MEN2A, yet, she was the only family member confirmed with primary hyperparathyroidism. One of her 2 daughters harbors *RET* pathogenic variant. Following the thyroid and parathyroid surgery, low normal calcium and PTH were intermittently found. However, currently, 10 y after surgery, thyroid assessment shows slightly elevated TSH = 4.96μUI/mL (normal: 0.35–4.94), normal FT4 (free levothyroxine) = 11.69 pmol/l (normal:9–19) under levothyroxine 100 μg/d and increased calcitonin of 18.5 pg/mL (normal:1–4.8). Cervical ultrasound did not indicate any remaining thyroid tissue after total thyroidectomy. Her biochemical phosphor-calcium panel shows decreased total serum calcium of 6.54 mg/dL (normal:8.4–10.3), high levels of phosphorus = 4.67 mg/dL (normal:2.5–4.5), normal 25-OHD (25-hydroxyvitamin D) = 40 ng/mL (normal:20–100) and low PTH = 10.76 pg/mL (normal:15–65) – these being the lowest value of PTH following the neck surgery. 24-h urinary calcium was

below normal range (0.02 g/24 h, normal: 0.07–0.3). Levothyroxine dose was increased to 112.5 μg/d, calcitriol 0.5 μg/d and calcium supplements were initiated.

Conclusion: This case highlights unexpected mild hypoparathyroidism following the removal of a single parathyroid tumor a decade before. Additional mechanisms such as autoimmune might be overlapped.

References:

1. Popa A, et al. J Clin Med 2023;12:1115
2. Nistor CE, et al. J Clin Med 2019;9:76
3. Tizu M, et al. J Funct Biomater 2022;13:109
4. Ciuche A, et al. Chirurgia (Bucur) 2012;107:206
5. Popescu M, et al. Rom J Morphol Embryol 2022;63:39
6. Osman A, et al. Metabolites 2023;13:1192
7. Popescu AD, et al. Diagnostics 2022;12:2669
8. Prodana M, et al. Coatings 2020;10:526
9. Maruntelu I, et al. Ann Transplant 2022;117:317
10. Gheorghe AM, et al. J Clin Med 2023;12:3416

P1048
DIFFICULTIES IN DECISION MAKING WITH REGARD TO MENOPAUSAL OSTEOPOROSIS COMPLICATED WITH AN ELBOW FRACTURE

M. Costachescu[1], O.-C. Sima[2], A.-M. Gheorghe[2], A.-I. Trandafir[2], E. Petrova[3]

[1]Dept. of Radiology and Medical Imaging, Fundeni Clinical Institute, [2]C.I. Parhon National Institute of Endocrinology & PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy, [3]Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Fragility fractures are associated with increased morbidity and mortality and reducing this risk is the most important aspect of anti-osteoporotic treatment. We aim to introduce a patient with osteoporosis that interrupted bisphosphonates therapy and suffered an elbow fracture. [1–10]

Case report: This is a 67-year-old female admitted for bone status investigation. She was diagnosed with osteoporosis at the age of 63, when DXA showed L1-L4 lumbar BMD = 0.829 g/cm^2, T-score = -2.8SD, Z-score = -1.6SD, femoral neck BMD = 0.796 g/cm^2, T-score = -1.7SD, Z-score = -0.5SD, total hip BMD = 0.848 g/cm^2, T-score = -1.3SD, Z-score = -0.3SD, third distal radius BMD = 0.504 g/cm^2, T-score = -2.9SD, Z-score = -1.7SD and treatment with weekly alendronate 70 mg was initiated. After 1 y, the lady stopped alendronate intake for 1 y due to COVID-19 pandemic restrictions and access difficulties to prescription; following this, she experienced a left elbow fracture. Weekly alendronate therapy was reinitiated, then a switch to oral weekly risedronate was done after 1 year due to mild gastrointestinal accuses. Currently, after 1 y of risedronate (associating a good clinical tolerance), DXA revealed an improvement L1-L4 BMD = 0.999 g/cm^2, T-score = -1.5SD, Z-score = -0.3SD, femoral neck BMD = 0.832 g/cm^2, T-score = -1.2SD, Z-score = 0.0SD, total hip BMD = 0.918 g/cm^2, T-score = -0.7SD, Z-score = 0.3SD, third distal radius BMD = 0.695 g/cm^2, T-score = -2.1SD, Z-score = -0.5SD. DXA-based TBS of 1.229 showed a degraded structure. Bone formation markers are within normal range: osteocalcin = 16.24 ng/mL (normal: 15–46), P1NP = 25.65 ng/mL (normal: 20.25–76.31) and bone resorption marker CrossLaps is slightly decreased of 0.31 ng/mL (normal: 0.33–0.782). Risedronate was further recommended in addition to adequate vitamin D intake.

Conclusion: Compliance to anti-osteoporotic treatment and periodical follow-up are mandatory in order to achieve good results, especially for patients with high risk of fragility fractures. A self-imposed drug holiday represents a challenge in the management of such patients.

References:

1. Popescu AD, et al. Diagnostics 2022;12:2669
2. Popa A, et al. J Clin Med 2023;12:1115
3. Tizu M, et al. J Funct Biomater 2022;13:109
4. Ciuche A, et al. Chirurgia (Bucur) 2012;107:206
5. Popescu M, et al. Rom J Morphol Embryol 2022;63:39
6. Prodana M, et al. Coatings 2020;10:526
7. Nistor CE, et al. J Clin Med 2019;9:76
8. Osman A, et al. Metabolites 2023;13:1192
9. Maruntelu I, et al. Ann Transplant 2022;117:317
10. Gheorghe AM, et al. J Clin Med 2023;12:3416

P1049
SYSTEMIC SCLEROSIS WITH FRAGILITY RIB FRACTURES: WHAT OPTIONS DO YOU HAVE IN DAILY PRACTICE?

M. Costachescu[1], A.-I. Trandafir[2], A.-M. Gheorghe[2], O.-C. Sima[2], E. Petrova[3]

[1]Dept. of Radiology and Medical Imaging, Fundeni Clinical Institute, [2]C.I. Parhon National Institute of Endocrinology & PhD Doctoral School, Carol Davila Univ. of Medicine and Pharmacy, [3]Dept. of Endocrinology, C.I. Parhon National Institute of Endocrinology & Dept. of Endocrinology, Carol Davila Univ. of Medicine and Pharmacy, Bucharest, Romania

Systemic sclerosis is an autoimmune disease that progresses with the affection of multiple organs, including the skin, lung, heart, gastrointestinal tract and musculoskeletal system. Patients with this condition are particularly predisposed to osteoporosis while subcutaneous administration might not work due to the skin involvement. [1–10] We aim to introduce a patient with systemic sclerosis and multiple rib fractures under antiresorptive treatment.

Case report: This was a 55-year-old female patient with advanced systemic sclerosis manifested with Raynaud syndrome, pulmonary fibrosis, esophagitis, pangastritis and calcinosis cutis. She was diagnosed with osteoporosis 11 years ago and followed treatment with bisphosphonates for 3 years, and she suffered two rib fractures under therapy. After 3 y of antiresorptive drugs, DXA showed L1-L4 BMD = 0.011 g/cm^2, T-score = -1.4SD, Z-score = -0.5SD, femoral neck BMD = 0.736 g/cm^2, T-score = -2.2SD, Z-score = -1SD, total hip BMD = 0.843 g/cm^2, T-score = -1.3SD, Z-score = -0.4SD. Therefore, a switch to anabolic medication with subcutaneous teriparatide 20 μg daily was done. After 1 year of teriparatide, BMD did not improve, possibly due to the scleroderma that interfered with administration; hence, she was considered non-responder. She continued with IV ibandronate for 2 y and new rib fractures occurred. After this event, 5 mg single annual zoledronate injection was administered, followed by denosumab for 4 y (60 mg every 6 months). Currently, DXA confirms further bone loss: L1-L4 BMD = 0.919 g/cm^2, T-score = -2.2SD, Z-score = -0.5SD, femoral neck = 0.632 g/cm^2, T-score = -2.9SD, Z-score = -1.4SD, total hip BMD = 0.752 g/cm^2, T-score = -2SD, Z-score = -0.8SD, with DXA-based TBS of 1.286 (a partially degraded microarchitecture). Calcium-phosphorus panel was at normal levels, including low normal levels of bone turnover markers. A decision to offer her zoledronate 5 mg intravenously was further established in addition to vitamin D supplementation.

Conclusion: Due to the nature of the disease, systemic sclerosis associated with osteoporosis leads to severe fragility fractures including at rib level. The failure of antiresorptive agents to improve BMD in this case pointed towards the need for anabolic medication.

However, the range of efficient drugs is limited by the multi-systemic complications, including cutaneous.

References:

1. Trandafir AI, et al. J Clin Med 2023;12:7399
2. Tizu M, et al. J Funct Biomater 2022;13:109
3. Nistor CE, et al. J Clin Med 2019;9:76
4. Ciuche A, et al. Chirurgia (Bucur) 2012;107:206
5. Popescu M, et al. Rom J Morphol Embryol 2022;63:39
6. Maruntelu I, et al. Ann Transplant 2022;117:317
7. Prodana M, et al. Coatings 2020;10:526
8. Gheorghe AM, et al. J Clin Med 2023;12:3416
9. Popa A, et al. J Clin Med 2023;12:1115
10. Cira CI,. et al. Int J Mol Sci 2023;24:4894

P1051
CORRELATIONS OF BONE TURNOVER MARKERS AND BMI IN PATIENTS WITH PSORIASIS

O.-M. Niţă[1], M. J. Ţuculina[2], D. M. Albulescu[1], L. E. Stoica[1], N. M. Bugălă[1], S. A. Preda[2]

[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania

Objective: Study of correlations of bone turnover marker values in relation to BMI in patients with psoriasis.[1–16].

Methods: The study was conducted between 2018–2020, included 58 patients with psoriasis (27 women and 38 men) aged between 23–74 y. BMI was calculated based on weight and height, using the classic kg/m^2 formula, with a study of the classic groups, respectively-groups based on BMI: normal weight (NW), with BMI between 18.5–24.9 kg/ m^2—15 cases, overweight (OW) group with BMI between 25–29.9 kg/m^2—18 cases, and obesity (first grade) group including patients with a BMI of 30–34,9 kg/m^2—25 cases The diagnosis of psoriasis was established based on the histopathological examination. The assessments include venous blood bone turnover markers as following: osteocalcin (electrochemiluminescence method) and bone resorption marker CrossLaps (electrochemiluminescence assay).

Results:

Group	Number of patients	OS (ng/mL)	CL (ng/mL)
NW	15	28.39±10.22	0.54±0.17
OW	18	25.39±12.73	0.50±0.24
I grade	25	22.32±11.79	0.43±0.22

Conclusion: Based on present study, the biochemical bone turnover markers are not distinctive between the groups of different BMI. Large intra-individual variations do not allow a predictive.

References:

1. Preda SA, et al. Rom J Morphol Embryol 2021;62:239
2. Bailescu I, et al. Exp Ther Med 2022;23:103
3. Preda SA, et al. Exp Ther Med 2022;23:254
4. Tuculina MJ, et al. Exp Ther Med 2022;23:288
5. Tuculina MJ, et al. Rom J of Oral Rehab 2022;14:78
6. Petrescu SMS, et al. Rom J of Oral Rehab 2022;14:38
7. Bechir ES, et al. Rev Chim (Bucharest) 2018;69:3565
8. Albulescu DM, et al. Rev Chim (Bucharest) 2018;69:2438
9. Diaconu CT, et al. Rom J of Oral Rehab 2023;15:411
10. Albulescu DM, et al. Rom J of Oral Rehab 2023;15:199
11. Bugălă NM, et al. Diagnostics (Basel) 2022;12:2080:1
12. Nicola AG, et al. Diagnostics (Basel) 2022;12:2168
13. Popescu AD, et al. Journal of Functional Biomaterials 2023;14:532
14. Dinescu SC, et al. Front. Med. 2023;10:1,286,085
15. Rusu A, et al. 14th International Conference Information Visualisation 2010:207 https://doi.org/10.1109/IV.2010.39
16. Eparu C, et al. Ovidius University Annals of Chemistry 2014;24:83

P1052
PSORIASIS, SEX HORMONES AND ERECTILE DYSFUNCTION

O.-M. Niţă[1], M. J. Ţuculina[2], D. M. Albulescu[1], L. E. Stoica[1], N. M. Bugălă[1], S. A. Preda[2]

[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania

Objective: Psoriasis is a chronic, relapsing skin disease that presents a wide variety of lesions, of different shapes and sizes, but the primary lesion is papulo-erythematous, covered by a shiny scale. Sex hormones play an essential role in the pathogenesis of psoriasis through their biological and immunological effects on the skin. Psoriasis, by its very nature, has a significant impact on the sexual function of patients and, therefore, on their quality of life. The role of this study was to establish correlations between serum sex hormones and erectile function in male patients with psoriasis. The study was compared with a group of healthy controls, we correlated these findings with various parameters of the dermatological disease. [1–16].

Methods: Total testosterone and serum estradiol were measured by an ELISA technique in 136 men with psoriasis and 47 healthy controls. Erectile function evaluation of all subjects included in the study was estimated by the international index of erectile function version-5.

Results: The group of patients with psoriasis showed a significantly lower serum level of total testosterone, a higher level of estradiol. The group of patients with psoriasis showed impaired erectile function compared to the group of healthy patients.

Conclusion: Hormonal values measured in the group of men with psoriasis prove a cause of the associated erectile dysfunction.

References:

1. Preda SA, et al. Rom J Morphol Embryol 2021;62:239
2. Bailescu I, et al. Exp Ther Med 2022;23:103
3. Preda SA, et al. Exp Ther Med 2022;23:254
4. Tuculina MJ, et al. Exp Ther Med 2022;23:288
5. Tuculina MJ, et al. Rom J of Oral Rehab 2022;14:78
6. Petrescu SMS, et al. Rom J of Oral Rehab 2022;14:38
7. Bechir ES, et al. Rev Chim (Bucharest) 2018;69:3565
8. Albulescu DM, et al. Rev Chim (Bucharest) 2018;69:2438
9. Diaconu CT, et al. Rom J of Oral Rehab 2023;15:411
10. Albulescu DM, et al. Rom J of Oral Rehab 2023;15:199
11. Bugălă NM, et al. Diagnostics (Basel) 2022;12:2080:1
12. Nicola AG, et al. Diagnostics (Basel) 2022;12:2168
13. Popescu AD, et al. Journal of Functional Biomaterials 2023;14:532
14. Dinescu SC, et al. Front. Med. 2023;10:1,286,085
15. Rusu A, et al. 14th International Conference Information Visualisation 2010:207 https://doi.org/10.1109/IV.2010.39
16. Eparu C, et al. Ovidius University Annals of Chemistry 2014;24:83

P1053
CORRELATIONS BETWEEN THYROID HORMONES AND PSORIASIS

O.-M. Niţă[1], M. J. Ţuculina[2], D. M. Albulescu[1], L. E. Stoica[1], N. M. Bugălă[1], S. A. Preda[2]

[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania

Objective: To evaluate the prevalence of thyroid diseases in patients confirmed with psoriasis compared to the group of healthy patients. [1–16].
Methods: The study was conducted in two groups. One group included patients with histopathologically confirmed psoriasis (59 patients—27 women—aged between 31–72 y and 32 men aged between 28–69 y) and a group of healthy patients (73 patients—44 female patients aged between 22–71 y—30 male patients aged between 23–62 y). Both groups of patients had thyroid evaluation in the form of measurement of TSH, free thyroxine (FT4), anti-thyroid peroxidase antibody (TPO Ab) and anti-thyroglobulin antibody (Tg Ab). Thyroid ultrasound examination was performed looking for volume, hypoechogenicity, pseudo-nodularity and increased vascularity. Psoriasis severity assessment was performed using the PASI (Psoriasis Area and Severity Index) score.
Results: In the group of patients with psoriasis, a significantly higher prevalence of TPO Ab, Tg Ab, hypo-echogenicity, pseudo-nodularity and vascularization was found. The prevalence in psoriasis vs. the healthy patient group was for TPO Ab (24.82 vs. 8.2%, $p = 0.022$), Tg Ab (29.94 vs. 10.12%, $p = 0.012$), hypoechogenicity (31.42 vs. 8.99%, $p = 0.023$), pseudonodularity (16.1 vs. 0%, $p = 0.002$) and increased vascularity (34.73 vs. 5.68%, $p = 0.002$). Psoriasis patients with age of onset at diagnosis $\geq$ 23 y No significant differences were reported in the prevalence of hypothyroidism and subclinical hypothyroidism between the two study groups. In patients with psoriasis, psoriasis types, severity, duration, age, sex, personal and family history of autoimmune diseases did not correlate with thyroid autoimmunity.
Conclusion: This study demonstrates a significant correlation between psoriasis and thyroid damage. Therefore, thyroid evaluation by anti-thyroid antibodies and ultrasound should be included in the diagnosis of patients with psoriasis.
References:

1. Preda SA, et al. Rom J Morphol Embryol 2021;62:239
2. Bailescu I, et al. Exp Ther Med 2022;23:103
3. Preda SA, et al. Exp Ther Med 2022;23:254
4. Tuculina MJ, et al. Exp Ther Med 2022;23:288
5. Tuculina MJ, et al. Rom J of Oral Rehab 2022;14:78
6. Petrescu SMS, et al. Rom J of Oral Rehab 2022;14:38
7. Bechir ES, et al. Rev Chim (Bucharest) 2018;69:3565
8. Albulescu DM, et al. Rev Chim (Bucharest) 2018;69:2438
9. Diaconu CT, et al. Rom J of Oral Rehab 2023;15:411
10. Albulescu DM, et al. Rom J of Oral Rehab 2023;15:199
11. Bugălă NM, et al. Diagnostics (Basel) 2022;12:2080:1
12. Nicola AG, et al. Diagnostics (Basel) 2022;12:2168
13. Popescu AD, et al. Journal of Functional Biomaterials 2023;14:532
14. Dinescu SC, et al. Front. Med. 2023;10:1,286,085
15. Rusu A, et al. 14th International Conference Information Visualisation 2010:207 https://doi.org/10.1109/IV.2010.39
16. Eparu C, et al. Ovidius University Annals of Chemistry 2014;24:83

P1054
NEUROLOGICAL, PSYCHIC AND BONE MANIFESTATIONS IN THYROID INSUFFICIENCY

O.-M. Niţă[1], M. J. Ţuculina[2], D. M. Albulescu[1], L. E. Stoica[1], N. M. Bugălă[1], S. A. Preda[2]

[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania

Objective: Identification of cases with thyroid insufficiency, clinical and biological objectification of the etiological diagnosis of hypothyroidism, evaluation of nervous and mental clinical manifestations, quantification of BMD by osteodensitometry (DXA).[1–16].
Methods: 36 cases (14 men and 22 women) were included in the study, whose ages were between 26–49 y, of which 13 developed hypothyroidism after surgical thyroidectomy, and 23 through an autoimmune mechanism. The following paraclinical investigations were performed: FT4 dosage, TSH, ATPO titer, thyroid ultrasound, and indirectly the thyroid function was evaluated through the existing changes in metabolism: lipidic, carbohydrate, enzymatic. Osteodensitometry (DXA) was assessed only in 5 cases with premature ovarian failure.
Results: Neuropsychic disorders are constantly severe and characteristic. It presents a slowing down (bradypsychia) of all the elements that make up the higher nervous activity. It shows permanent drowsiness, especially during the day, and the attention is deficient, with a lack of interest especially in personal and social events. Sensory and neurological disorders are constant but variable in intensity. In the 5 cases investigated by DXA, the T-score values were between -2.9 and -4,1 D.S. All cases presented high TSH values and the ATPO titer was increased in cases with autoimmune hypothyroidism.
Conclusion: Neuropsychic disorders are constant, characteristic and severe in hypothyroidism. Osteo-articular disorders are found especially in cases with severe hypothyroidism (myxedema).
References:

1. Preda SA, et al. Rom J Morphol Embryol 2021;62:239
2. Bailescu I, et al. Exp Ther Med 2022;23:103
3. Preda SA, et al. Exp Ther Med 2022;23:254
4. Tuculina MJ, et al. Exp Ther Med 2022;23:288
5. Tuculina MJ, et al. Rom J of Oral Rehab 2022;14:78
6. Petrescu SMS, et al. Rom J of Oral Rehab 2022;14:38
7. Bechir ES, et al. Rev Chim (Bucharest) 2018;69:3565
8. Albulescu DM, et al. Rev Chim (Bucharest) 2018;69:2438
9. Diaconu CT, et al. Rom J of Oral Rehab 2023;15:411
10. Albulescu DM, et al. Rom J of Oral Rehab 2023;15:199
11. Bugălă NM, et al. Diagnostics (Basel) 2022;12:2080:1
12. Nicola AG, et al. Diagnostics (Basel) 2022;12:2168
13. Popescu AD, et al. Journal of Functional Biomaterials 2023;14:532
14. Dinescu SC, et al. Front. Med. 2023;10:1,286,085
15. Rusu A, et al. 14th International Conference Information Visualisation 2010:207 https://doi.org/10.1109/IV.2010.39
16. Eparu C, et al. Ovidius University Annals of Chemistry 2014;24:83

P1055
THERAPEUTIC MANAGEMENT IN HYPOGONADIC OSTEOPOROSIS

O.-M. Niţă[1], M. J. Ţuculina[2], D. M. Albulescu[1], L. E. Stoica[1], N. M. Bugălă[1], S. A. Preda[2]

[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania

Objective: Hypogonadal osteoporosis can set in early, it is asymptomatic for a long time and the etiological diagnosis is sometimes laborious. The early diagnosis of gonadal insufficiency requires the adoption of some measures to prevent bone changes from the prepubertal, pubertal or postpubertal stage in order to ensure a maximum bone mass corresponding to sex and age.[1–16].
Methods: The case study is represented by 67 patients, of which with: late puberty (36 cases) and premature ovarian failure (31 cases). Clinical and paraclinical criteria were used to elucidate the etiological diagnosis.
Conclusion: The paper suggests two major objectives in the therapeutic strategy of hypogonadal osteoporosis: early diagnosis of gonadal insufficiency, in order to adopt some prophylactic measures of bone changes; estrogen-progestational/androgenic substitution associated with antiresorptive or proforming medication.
References:

1. Preda SA, et al. Rom J Morphol Embryol 2021;62:239
2. Bailescu I, et al. Exp Ther Med 2022;23:103
3. Preda SA, et al. Exp Ther Med 2022;23:254
4. Tuculina MJ, et al. Exp Ther Med 2022;23:288
4. Tuculina MJ, et al. Rom J of Oral Rehab 2022;14:78
5. Petrescu SMS, et al. Rom J of Oral Rehab 2022;14:38
6. Bechir ES, et al. Rev Chim (Bucharest) 2018;69:3565
7. Albulescu DM, et al. Rev Chim (Bucharest) 2018;69:2438
8. Diaconu CT, et al. Rom J of Oral Rehab 2023;15:411
9. Albulescu DM, et al. Rom J of Oral Rehab 2023;15:199
10. Bugălă NM, et al. Diagnostics (Basel) 2022;12:2080:1
11. Nicola AG, et al. Diagnostics (Basel) 2022;12:2168
12. Popescu AD, et al. Journal of Functional Biomaterials 2023;14:532
13. Dinescu SC, et al. Front. Med. 2023;10:1,286,085
14. Rusu A, et al. 14th International Conference Information Visualisation 2010:207 https://doi.org/10.1109/IV.2010.39
15. Eparu C, et al. Ovidius University Annals of Chemistry 2014;24:83

P1056
ROLE OF LOCAL CYTOKINES IN THE NERVOUS REGULATION OF OSTEOPOROSIS

O.-M. NIŢĂ[1], M. J. Ţuculina[2], D. M. Albulescu[1], L. E. Stoica[1], N. M. Bugălă[1], S. A. Preda[2]

[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania

The neuropeptide Y system (NPY) is one of the frequently expressed neuropeptides in neuronal tissues, being found in both central and peripheral nervous systems. In the brain, NPY has a complex distribution, with marked expression in a number of regions, with the highest levels of expression occurring within the hypothalamus. Specifically, hypothalamic NPY-ergic neurons are most prominently distributed in the arcuate nucleus. In peripheral nervous tissue, NPY is found in the sympathetic nervous system, co-stored and co-released with noradrenaline during nerve stimulation. While NPY expression was initially discovered in neural tissue, it is increasingly present in peripheral tissues. It is important to know that NPY is expressed in osteoblastic cells. In addition to NPY, there are two other ligands of the NPY family; peptide YY (PYY) and pancreatic polypeptide (PP).[1–16].
References:

1. Preda SA, et al. Rom J Morphol Embryol 2021;62:239
2. Bailescu I, et al. Exp Ther Med 2022;23:103
3. Preda SA, et al. Exp Ther Med 2022;23:254
4. Tuculina MJ, et al. Exp Ther Med 2022;23:288
5. Tuculina MJ, et al. Rom J of Oral Rehab 2022;14:78
6. Petrescu SMS, et al. Rom J of Oral Rehab 2022;14:38
7. Bechir ES, et al. Rev Chim (Bucharest) 2018;69:3565
8. Albulescu DM, et al. Rev Chim (Bucharest) 2018;69:2438
9. Diaconu CT, et al. Rom J of Oral Rehab 2023;15:411
10. Albulescu DM, et al. Rom J of Oral Rehab 2023;15:199
11. Bugălă NM, et al. Diagnostics (Basel) 2022;12:2080:1
12. Nicola AG, et al. Diagnostics (Basel) 2022;12:2168
13. Popescu AD, et al. Journal of Functional Biomaterials 2023;14:532
14. Dinescu SC, et al. Front. Med. 2023;10:1,286,085
15. Rusu A, et al. 14th International Conference Information Visualisation 2010:207 https://doi.org/10.1109/IV.2010.39
16. Eparu C, et al. Ovidius University Annals of Chemistry 2014;24:83

P1057
ESTROGEN AND BONE HEALTH IN MEN AND WOMEN

O.-M. Niţă[1], M. J. Ţuculina[2], D. M. Albulescu[1], L. E. Stoica[1], N. M. Bugălă[1], S. A. Preda.[2]
[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania.

Estrogen is the key regulator of bone metabolism in both men and women. Estrogens actively suppress bone turnover and maintain a balanced rate of bone formation and resorption. At the cellular level, estrogens affect the generation, lifespan, and functional activity of osteoclasts and osteoblasts. They decrease osteoclast formation and activity, while increasing osteoclast apoptosis. At the molecular level, estrogens decrease the production of cytokines, inhibiting osteoclast apoptosis, such as IL-1, IL-6, TNFα, M-CSF, and decrease the expression of the activated NfkB gene, a suppressor of apoptosis. In contrast, estrogens favor the expression of TGFβ, a direct inhibitor of osteoclast activity and an activator of osteoclastic apoptosis. Estradiol level also predicts fractures. Similar associations were found in men. Despite lower BMD and higher fracture risk in men with hypogonadism, there is little association between circulating testosterone, fracture, and bone loss. However, the combination of any low sex steroid hormone and 25-hydroxyvitamin D was associated with an increased risk of fracture. Menopausal hormone therapy has been shown to reduce fracture rates Clinical trials of testosterone therapy in older men yield tantalizing but inconclusive results. The results suggest that testosterone treatment probably improves BMD, but the results are less conclusive in older men than in younger men.[1–16].
References:

1. Preda SA, et al. Rom J Morphol Embryol 2021;62:239
2. Bailescu I, et al. Exp Ther Med 2022;23:103
3. Preda SA, et al. Exp Ther Med 2022;23:254
4. Tuculina MJ, et al. Exp Ther Med 2022;23:288
5. Tuculina MJ, et al. Rom J of Oral Rehab 2022;14:78
6. Petrescu SMS, et al. Rom J of Oral Rehab 2022;14:38
7. Bechir ES, et al. Rev Chim (Bucharest) 2018;69:3565
8. Albulescu DM, et al. Rev Chim (Bucharest) 2018;69:2438
9. Diaconu CT, et al. Rom J of Oral Rehab 2023;15:411
10. Albulescu DM, et al. Rom J of Oral Rehab 2023;15:199
11. Bugălă NM, et al. Diagnostics (Basel) 2022;12:2080:1

12. Nicola AG, et al. Diagnostics (Basel) 2022;12:2168
13. Popescu AD, et al. Journal of Functional Biomaterials 2023;14:532
14. Dinescu SC, et al. Front. Med. 2023;10:1,286,085
15. Rusu A, et al. 14th International Conference Information Visualisation 2010:207 https://doi.org/10.1109/IV.2010.39
16. Eparu C, et al. Ovidius University Annals of Chemistry 2014;24:83

P1058
THE IMPORTANCE OF MODERN INVESTIGATIONS IN ORTHODONTICS

O.-M. Niţă[1], F. I. Mărăşescu[2], P. Mărăşescu[2]

[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania

In the correct diagnosis of dento-maxillary abnormalities, the knowledge of their complex etiopathogenesis associated with the application of modern investigative techniques facilitates the application of a personalized treatment to the clinical case. At present, nutritional disorders play an essential role in the occurrence of these anomalies. A diet poor in vitamin A can cause the appearance of dental hypoplasia or a reduced calcification of the alveolar processes with the appearance of dento-alveolar disharmony with dental crowding. Vitamin D deficiency at young ages (up to 1 year) leads to the appearance of serious diseases (rickets), with repercussions in the development of the dento-maxillary apparatus and implicitly malocclusions. At older ages, it can cause the appearance of dental caries and tooth fractures with the appearance of dental malpositions. Hypo or hypersecretion of the endocrine glands along with factors also play a substantial role in the occurrence of malocclusions. Current orthodontic treatment techniques, also bring about undesirable changes in the enamel surface. This creates favorable conditions for the appearance of dental caries. The OCT (optical coherence tomography) helps us to identify the cracks that appear in the enamel structure following orthodontic treatment. The in vivo applicability of OCT will lead to an increase in the performance of orthodontic treatment techniques. CBCT (cone beam computed tomography), MRI, MEF are other modern investigative techniques that allow us to detect deficiencies in orthodontic treatment techniques. Thus, we can emphasize the accuracy and efficiency of these modern investigative techniques in orthodontics. Their role is to help us establish a quick and accurate diagnosis of dento-maxillary abnormalities. The purpose of these investigations is also to identify the etiological factors of these anomalies and subsequently correct them as much as possible. These investigations are also useful for improving the quality of orthodontic treatment materials and techniques.[1–16].

References:

1. Preda SA, et al. Rom J Morphol Embryol 2021;62:239
2. Bailescu I, et al. Exp Ther Med 2022;23:103
3. Preda SA, et al. Exp Ther Med 2022;23:254
4. Tuculina MJ, et al. Exp Ther Med 2022;23:288
5. Tuculina MJ, et al. Rom J of Oral Rehab 2022;14:78
6. Petrescu SMS, et al. Rom J of Oral Rehab 2022;14:38
7. Bechir ES, et al. Rev Chim (Bucharest) 2018;69:3565
8. Albulescu DM, et al. Rev Chim (Bucharest) 2018;69:2438
9. Diaconu CT, et al. Rom J of Oral Rehab 2023;15:411
10. Albulescu DM, et al. Rom J of Oral Rehab 2023;15:199
11. Bugălă NM, et al. Diagnostics (Basel) 2022;12:2080:1
12. Nicola AG, et al. Diagnostics (Basel) 2022;12:2168
13. Popescu AD, et al. Journal of Functional Biomaterials 2023;14:532
14. Dinescu SC, et al. Front. Med. 2023;10:1,286,085
15. Rusu A, et al. 14th International Conference Information Visualisation 2010:207 https://doi.org/10.1109/IV.2010.39
16. Eparu C, et al. Ovidius University Annals of Chemistry 2014;24:83

P1059
MEDICATION RELATED OSTEONECROSIS OF THE JAWS: A RETROSPECTIVE STUDY

O.-M. Niţă[1], G. A. Ciobanu[2], A. Camen[2], M. Ionescu[2], R. Mercuţ[1], S. M. Popescu[2]

[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania

Medication related osteonecrosis of the jaws (MRONJ) is a severe complication among patients treated with different types of medication, like bisphosphonates, usually for osteoporosis or for the prevention or treatment of bone metastases from various forms of cancer [1–4]. Frequently, bisphosphonate osteonecrosis is diagnosed in an advanced stage when it became clinically evident, as in case of the exposure of a bone area in the oral cavity [5,6]. MRONJ has a multifactorial aetiology, being implicated systemic factors such as hypertension [7], as well as local factors, such as dental extractions, periodontal disease and periapical infections [8–10]. The aim of the retrospective study was to determine the frequency of osteonecrosis cases in Oltenia region in the period 2012–2022. Material and method: The data extracted from the file charts and used in this study were: age, sex, environment, condition treated with bisphosphonate, MRONJ location and stage. The statistical analysis was performed with Microsoft Excel and SPSS for Windows. Results: The study included 126 patients, of which 51 men and 75 women, with an average age of 65.4 ± 9.5. The age groups most affected by MRONJ were between 70–79 and 60–69 years, with a disease frequency of 55%, respectively 32% of the group. MRONJ was predominant in women aged between 50–69 years, while for men the most affected age group was 70–79 years ($p < 0.05$). MRONJ was encountered especially in women with breast or ovarian cancer (31.94%), and in men with prostate cancer (18.06%). From MRONJ patients only 5.55% had osteoporosis, especially women. The main bisphosphonate implicated in MRONJ was IV zoledronic acid in cancer cases. Ibandronic acid, alendronic acid and risedronate sodium have been implicated in MRONJ in osteoporosis cases. From the studied group, 31.94% were diagnosed with osteonecrosis of the jaw and 68.06% with osteonecrosis of the mandible, achieving a ratio of 1:2.13 ($p < 0.005$). Patients presented to the hospital with an advanced stage of MRONJ, for mandibular MRONJ being stage II in 81% of cases and for maxillary MRONJ being stage III in 72% of cases ($p < 0.05$). **Conclusion:** MRONJ was encountered especially in patients with breast, ovarian or prostate neoplasm, with bone metastases, who received intravenous zoledronic acid, being especially present in the mandible, in advanced stages. Medication related osteonecrosis of the jaw in patients with osteoporosis was less common compared to osteonecrosis in patients with cancer.

References:

1. Ciobanu GA, et al. Rom J of Oral Rehab 2022;14:56
2. Ciobanu GA, et al. J Clin Med 2023;12:3383
3. Ciobanu GA, et al. Curr Health Sci J 2021;47:117
4. Ciobanu GA, et al. J Clin Med. 2023 29;12:3747
5. Ciobanu GA, et al. Int J Mol Sci 2023;24:14,345
6. Fărcaş-Berechet CM, et al. Rom J Morphol Embryol. 2019;60:1191
7. Bănică AC, et al. Rom J Morphol Embryol. 2018;59:811
8. Ţuculina MJ, et al. Rom J Morphol Embryol 2013;54:1081
9. Bechir ES, et al. Rev Chim (Bucureşti) 2019;70: 3176
10. Bechir ES, et al. Rev Chim (Bucureşti) 2019;70: 3515

P1060
IS THERE A CONNECTION BETWEEN BRUXISM AND VITAMIN D LEVELS?

O.-M. Niţă[1], A. M. Popescu[2], D. E. Vlăduţu[2], V. Mercuş[2], S. M. Popescu[2], M. J. Ţuculina[2]

[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania

Bruxism is a contraction disorder of the masticatory muscles [1–3] characterized by grinding and clenching of the teeth and/or thrusting and bracing of the mandible [4–8]. The prevalence of bruxism is 3.5-40.6% in children, 31.6% in adolescents (students) [9] and 21.5% in adults, with 5% for awake bruxism and 16.5% for sleep bruxism [10]. Vitamin D, or its active form 1,25-dihydroxyvitamin D3 [1,25(OH)2D3] influences masticatory muscles improving thickness and tonicity [11]. For this review, potential role of vitamin D in the etiology of bruxism was inquired in order to establish whether the current knowledge supports 25-hidroxyvitamin D (25-OHD) supplementation in bruxism associated with insufficient levels of vitamin D. Methods. A literature research was performed in Google Scholar, PubMed, Science Direct, Wiley and Scopus databases, and a total of 9 articles were included for analysis. Results. Among the studies published to date, investigating the role for vitamin D in the bruxism aetiology, there are 4 of them suggesting a connection between bruxism and vitamin D serum levels. As a result, bruxism suffering patients with deficient levels of vitamin D (< 30 ng/mL) could benefit from supplementation. Supplementation with vitamin D especially in winter could be a simple way to reduce the intensity and frequency of bruxism episodes. In order to introduce this approach in current practice, more randomized and placebo-controlled trials are needed.

References:

1. Vlăduţu DE, et al. Rom J of Oral Rehab 2022;14:26
2. Vlăduţu D, et al. Int J of Environ Res Public Health 2022;19:5415
3. Croitoru CI, et al. Stomatology Edu J 2014;1:28
4. Vlăduţu DE, et al. Int J of Environ Res Public Health 2023;20:581
5. Vlăduţu DE, et al. Int J of Environ Res Public Health 2023;20:4877
6. Mercut V, et al. Rom J of Oral Rehab 2021;13:37
7. Vatu M, et al. Rom J of Oral Rehab 2018;10:20
8. Ţuculina MJ, et al. Rom J Morphol Embryol 2013;54:1081
9. Bechir ES, et al. Rev Chim (Bucharest) 2019;70:3176
10. Bechir ES, et al. Rev Chim (Bucharest) 2019;70:3515

P1061
ROLE OF CHROMIUM PICOLINATE IN THE POTENTIATION OF INSULIN ACTION

O.-M. Niţă[1], S. A. Preda[2], N. M. Bugălă[1], D. M. Albulescu[1], L. E. Stoica[1], O. A. Diaconu[2], A. Nicola[2], M. Bătăiosu[2], C. Dăguci[2]

[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania

Chromium, in the form of trivalent chromium, is a trace element naturally present in many foods and available as a dietary supplement. Chromium may play a role in carbohydrate, lipid, and protein metabolism by potentiating the action of insulin. Although the precise mechanism for this activity has not been identified, scientists suggest that chromium binds to an oligopeptide to form cromodulin, a low molecular weight substance that binds to chromium and activates the insulin receptor to stimulate insulin action. Chromium may also have antioxidant effects. Chromium may have beneficial effects on impaired glucose tolerance and diabetes mellitus, metabolic syndrome, polycystic ovary syndrome, dyslipidemia, and obesity. We aim to measure the impact of chromium supplementation on anthropometric indices. Concomitant use of chromium with insulin may increase the risk of hypoglycemia. Since some studies have shown that chromium supplementation may lower blood sugar levels, metformin or other diabetes medications taken with chromium may increase the risk of hypoglycemia.[1–16].

References:

1. Preda SA, et al. Rom J Morphol Embryol 2021;62:239
2. Bailescu I, et al. Exp Ther Med 2022;23:103
3. Preda SA, et al. Exp Ther Med 2022;23:254
4. Tuculina MJ, et al. Exp Ther Med 2022;23:288
5. Tuculina MJ, et al. Rom J of Oral Rehab 2022;14:78
6. Petrescu SMS, et al. Rom J of Oral Rehab 2022;14:38
7. Bechir ES, et al. Rev Chim (Bucharest) 2018;69:3565
8. Albulescu DM, et al. Rev Chim (Bucharest) 2018;69:2438
9. Diaconu CT, et al. Rom J of Oral Rehab 2023;15:411
10. Albulescu DM, et al. Rom J of Oral Rehab 2023;15:199
11. Bugălă NM, et al. Diagnostics (Basel) 2022;12:2080:1
12. Nicola AG, et al. Diagnostics (Basel) 2022;12:2168
13. Popescu AD, et al. Journal of Functional Biomaterials 2023;14:532
14. Dinescu SC, et al. Front. Med. 2023;10:1,286,085
15. Rusu A, et al. 14th International Conference Information Visualisation 2010:207 https://doi.org/10.1109/IV.2010.39
16. Eparu C, et al. Ovidius University Annals of Chemistry 2014;24:83

P1062
PERIODONTAL TREATMENT WITH LASER ER:YAG IN THE CASE OF PERIODONTITIS WITH RAPID EVOLUTION IN PATIENTS WITH DIABETES AND ENDOCRINE DISEASES

O.-M. Niţă[1], D. M. Albulescu[1], L. E. Stoica[1], O. A. Diaconu[2], A. Nicola[2], M. Bătăiosu[2], C. Dăguci[2], A. Camen[2]

[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania

Traditional periodontal treatment usually involves the use of metal and rotary instruments to remove plaque and tartar. This can be a painful and invasive procedure that can cause bleeding and discomfort for the patient.[1–16] The LiteTouch laser is an innovative technology that can provide a more effective and comfortable alternative for periodontal treatment. LiteTouch emits a high-energy light beam that can be used to remove plaque and tartar without causing pain or discomfort to the patient. Among the advantages of using the LiteTouch laser for periodontal treatment we mention:

- Minimal pain: LiteTouch laser procedures are non-invasive, requiring no anesthesia.

This means that the patient will experience minimal or no pain during the treatment.

- Minimal Bleeding: The LiteTouch Laser is a precise tool that can be used to remove plaque and tartar without damaging healthy tissue. This means that the patient will experience minimal or no bleeding during treatment.

- Faster healing: The LiteTouch laser helps stimulate tissue healing, leading to faster gum healing.

- Better results: The LiteTouch laser helps achieve better results in periodontal treatment compared to traditional treatment.

In addition to these advantages, the LiteTouch laser also offers the following benefit for dentists: efficiency: The LiteTouch laser can be used to remove plaque and tartar faster and more efficiently than traditional tools. This can lead to a reduction in treatment time and labor costs.

References:
1. Preda SA, et al. Rom J Morphol Embryol 2021;62:239
2. Bailescu I, et al. Exp Ther Med 2022;23:103
3. Preda SA, et al. Exp Ther Med 2022;23:254
4. Tuculina MJ, et al. Exp Ther Med 2022;23:288
5. Tuculina MJ, et al. Rom J of Oral Rehab 2022;14:78
6. Petrescu SMS, et al. Rom J of Oral Rehab 2022;14:38
7. Bechir ES, et al. Rev Chim (Bucharest) 2018;69:3565
8. Albulescu DM, et al. Rev Chim (Bucharest) 2018;69:2438
9. Diaconu CT, et al. Rom J of Oral Rehab 2023;15:411
10. Albulescu DM, et al. Rom J of Oral Rehab 2023;15:199
11. Bugălă NM, et al. Diagnostics (Basel) 2022;12:2080:1
12. Nicola AG, et al. Diagnostics (Basel) 2022;12:2168
13. Popescu AD, et al. Journal of Functional Biomaterials 2023;14:532
14. Dinescu SC, et al. Front. Med. 2023;10:1,286,085
15. Rusu A, et al. 14th International Conference Information Visualisation 2010:207 https://doi.org/10.1109/IV.2010.39
16. Eparu C, et al. Ovidius University Annals of Chemistry 2014;24:83

P1063
PROMOTION OF DENTAL IMPLANT THERAPY IN PATIENTS WITH OSTEOPOROSIS

O.-M. Niţă[1], N. M. Bugălă[1], S. A. Preda[2], O. A. Diaconu[2], L. E. Stoica[1], A. Camen[2], M. J. Ţuculina[2]

[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania

Osteoporosis changes the density of the bones in the oral cavity, but does not influence the possibility of replacing missing teeth with dental implants. Depending on the bone with which the patient presents to the dentist, whether soft or hard, the specialist surgeon determines together with him which technique is the most adapted and which materials are beneficial depending on the density of the bone. When patients find out that they are diagnosed with osteoporosis, and the treating doctor has to prescribe a treatment with bisphosphonates, it is very important that before taking the drugs they come to the dentist, to solve all their dental problems.[1–16] During a single surgical intervention, the team of specialists will insert the dental implants. As a rule, 6 implants are recommended for the upper part of the maxillary arch and 4 implants for the lower part. In addition to dental implants, other procedures can be performed. For example, if you do not have enough bone, the doctor can perform a bone addition before inserting the implants.

References:
1. Preda SA, et al. Rom J Morphol Embryol 2021;62:239
2. Bailescu I, et al. Exp Ther Med 2022;23:103
3. Preda SA, et al. Exp Ther Med 2022;23:254
4. Tuculina MJ, et al. Exp Ther Med 2022;23:288
5. Tuculina MJ, et al. Rom J of Oral Rehab 2022;14:78
6. Petrescu SMS, et al. Rom J of Oral Rehab 2022;14:38
7. Bechir ES, et al. Rev Chim (Bucharest) 2018;69:3565
8. Albulescu DM, et al. Rev Chim (Bucharest) 2018;69:2438
9. Diaconu CT, et al. Rom J of Oral Rehab 2023;15:411
10. Albulescu DM, et al. Rom J of Oral Rehab 2023;15:199
11. Bugălă NM, et al. Diagnostics (Basel) 2022;12:2080:1
12. Nicola AG, et al. Diagnostics (Basel) 2022;12:2168
13. Popescu AD, et al. Journal of Functional Biomaterials 2023;14:532
14. Dinescu SC, et al. Front. Med. 2023;10:1,286,085
15. Rusu A, et al. 14th International Conference Information Visualisation 2010:207 https://doi.org/10.1109/IV.2010.39
16. Eparu C, et al. Ovidius University Annals of Chemistry 2014;24:83

P1064
THE ROLE OF VITAMIN K2 IN THE TREATMENT OF OSTEOPOROSIS

O.-M. Niţă[1], D. M. Albulescu[1], S. A. Preda[2], L. E. Stoica[1], O. A. Diaconu[2], A. Nicola[2], A. Camen[2], M. J. Ţuculina[2]

[1]Univ. of Medicine and Pharmacy, Faculty of Medicine, [2]Univ. of Medicine and Pharmacy, Faculty of Dentistry, Craiova, Romania

A coenzyme of glutamate γ-carboxylase, vitamin K2 can carboxylate glutamate residues of vitamin K-dependent osteocalcin proteins and γ-carboxylate glutamate residues. Several studies have shown that vitamin K2 can provide major benefits for bone health. Osteocalcin would thus favor bone formation. However, if we think about fat-soluble vitamin K2, it is difficult to reach its maximum concentration in the body. In addition, there is a risk of local overdose, since the vitamin is stored in the liver.[1–16] The latest studies state that their hope is to improve the bioavailability of vitamin K2, and their results are worth noting. They obtained spherical nanoparticles uniformly dispersed in the aqueous solution by optimizing the molar mixing ratio of the carrier protein and vitamin K2. Nonpharmacological management of osteoporosis includes adequate calcium and vitamin D intake, weight-bearing exercise, smoking cessation, limiting alcohol and caffeine consumption, and learning relapse prevention techniques.

References:
1. Preda SA, et al. Rom J Morphol Embryol 2021;62:239
2. Bailescu I, et al. Exp Ther Med 2022;23:103
3. Preda SA, et al. Exp Ther Med 2022;23:254
4. Tuculina MJ, et al. Exp Ther Med 2022;23:288
5. Tuculina MJ, et al. Rom J of Oral Rehab 2022;14:78
6. Petrescu SMS, et al. Rom J of Oral Rehab 2022;14:38
7. Bechir ES, et al. Rev Chim (Bucharest) 2018;69:3565
8. Albulescu DM, et al. Rev Chim (Bucharest) 2018;69:2438
9. Diaconu CT, et al. Rom J of Oral Rehab 2023;15:411
10. Albulescu DM, et al. Rom J of Oral Rehab 2023;15:199
11. Bugălă NM, et al. Diagnostics (Basel) 2022;12:2080:1
12. Nicola AG, et al. Diagnostics (Basel) 2022;12:2168
13. Popescu AD, et al. Journal of Functional Biomaterials 2023;14:532
14. Dinescu SC, et al. Front. Med. 2023;10:1,286,085
15. Rusu A, et al. 14th International Conference Information Visualisation 2010:207 https://doi.org/10.1109/IV.2010.39
16. Eparu C, et al. Ovidius University Annals of Chemistry 2014;24:83

P1065
COMPARATIVE ANALYSIS OF DUAL AND SINGLE CNN MODELS FOR THE CLASSIFICATION OF OSTEOPOROSIS, OSTEOPENIA, AND NORMAL BONE CONDITIONS

P. Achararit[1], S. Rathapoom[1], P. Nonthasaen[1], Y. Laphatrada[2], T. Chobpenthai[1]

[1]Princess Srisavangavadhana College of Medicine, Chulabhorn Royal Academy, [2]MUSC Expertise Faculty of Science, Mahidol Univ., Bangkok, Thailand

Objective: To critically evaluate and compare the effectiveness of dual-stage vs. single-convolutional neural network (CNN) models in classifying osteoporosis, osteopenia, and normal bone conditions,

focusing on Area Under the Curve (AUC) as the primary evaluation metric.

Methods: The study implemented two experimental setups: a single CNN model and a dual-stage CNN model. A range of architectures including VGG19, Xception, DenseNet169, InceptionResNetV2, and ResNetRS101 was trained and evaluated to identify the most effective model for each classification stage. In the dual-stage setup, the first configuration aimed to differentiate normal from abnormal conditions (osteopenia and osteoporosis), and then further classify between osteopenia and osteoporosis. The second configuration focused on separating normal/osteopenia from osteoporosis, followed by distinguishing normal from osteopenia. The performance of each model was rigorously assessed using a dataset of 658 bone density images from Chulabhorn Hospital. This dataset comprised 132 normal, 246 osteopenia, and 160 osteoporosis images for training, supplemented by 20 images per class for validation and testing.

Results: The single CNN model, using the Xception architecture, achieved an AUC of 0.74. The dual-stage model's first configuration, utilizing InceptionResNetV2 for both levels, yielded an average AUC of 0.75. The second configuration showed a more robust performance with an average AUC of 0.84, achieved by InceptionResNetV2 in the initial stage and DenseNet169 in the subsequent stage.

Conclusion: The study highlights the dual-stage model's superior classification accuracy, particularly in its second configuration, compared to the single model. This emphasizes the value of specialized CNN architectures for distinct classification stages. The findings advocate for a multi-faceted diagnostic approach, suggesting that employing different CNN models for separate tasks can significantly improve the accuracy and reliability of medical image analysis in classifying osteoporosis, osteopenia, and normal bone conditions.

Acknowledgement: This research project is funded by Chulabhorn Royal Academy.

P1066
DEVELOPMENT OF A SIMPLE PREDICTIVE MODEL WITHOUT USING CLINICAL RISKS FOR CAPTURE VERTEBRAL FRAGILITY FRACTURE AND COMPARISON WITH PREVIOUS MODELS

P. Chanplakorn[1], T. Lertudomphonwanit[1], N. Daraphongsataporn[1], C. Sritara[2], S. Jaovisidha[3], P. Sa-Ngasoongsong[1]

[1]Dept. of Orthopedics, Faculty of Medicine Ramathibodi Hospital, Mahidol Univ., [2]Dept. of Diagnostic and Therapeutic Radiology, Faculty of Medicine Ramathibodi Hospital, Mahidol Univ., [3]Dept. of Radiology, Faculty of Medicine, Ramathibodi Hospital, Mahidol Univ., Bangkok, Thailand

Objective: Early detection of vertebral fragility fracture (VFF) is crucial for maintaining patient's QOL. Many diagnosis tools have been introduced for screening the overall fracture risk but not aiming to identify the risk for VFF. The objective of this research is to study a predictive model for capture VFF and compare with previous models.

Methods: A retrospective review was conducted. Women aged $\geq$ 50 y who underwent DXA and vertebral fracture assessment (VFA) for osteoporosis screening between 2012–2019 were included. The data included age, height, weight, history of height loss (HHL) and BMD were retrieved. Sequential receiver operating characteristic (ROC) analysis, Univariate and Multivariate logistic regression was performed. A predictive model of VFF was subsequently formulated. The result of other models was calculated according to original report.

Results: A total of 617 women were included, VFF identified in 179 women. Multivariate regression analysis showed that age > 65, height loss > 1.5 cm, and femoral neck T-score < -1.7 were independent factors for risk of VFF (Fig. 1). Compared to FRAX model our model revealed comparable performance. Model without BMD included all parameters revealed highest specificity. This model revealed superior performance to FRAX, KKOS and OSTA, comparable performance to ISCD but revealed higher specificity (Fig. 2).

Figure 1 Demographic data between fracture (VFF) and non-fracture group

Characteristics	Whole cohort (n=617)	No fracture (n = 438)	Vertebral fracture (n = 179)	p-value	Youden criterion*
Value displayed in mean ± SD[a]					
Age (yr)	68.52±8.56	66.97 ± 8.32	72.31 ± 7.98	<0.01	**65.00**
Height (cm)	151.55±5.83	152.13 ± 5.80	150.14 ± 5.67	<0.01	**152.00**
Weight (kg)	56.17±9.91	56.29 ± 9.87	55.89 ± 10.03	0.654	58.80
BMI (kg/m2)	24.47±4.18	24.35 ± 4.22	24.76 ± 4.08	0.258	24.49
Value displayed in median (min, max)[b]					
History of height loss (cm)	1.0 (0,9)	0.5 (0,6)	1.5(0,9)	<0.01	**1.50**
BMD T-score L1-L4	-1.7(-5.6,3.1)	-1.6 (-5.1,2.6)	-1.9 (-5.6,3.1)	0.017	**-1.80**
BMD T-score femoral neck	-2.0(-4.9,1.4)	-1.9 (-4.4,1.4)	-2.2 (-4.9,0.4)	<0.01	**-1.70**
BMD T-score total hip	-0.9(-4.3,2.7)	-0.8 (-4.3,2.7)	-1.0 (-4.0,1.4)	<0.01	**-0.50**
Steroid usage n (%)	2(100%)	1(0.2%)	1(0.6%)	0.513*	N/A

a; data was in normal distribution: the statistical difference was calculated by T-test, b; data was not in normal distribution: the statistical difference was calculated by Wilcoxon rank-sum test, +; Chi square test *calculated from ROC analysis, Bold; significant level for area under the curve (AUC)=0.05, N/A; not applicable

Figure 2. Performance of the predictive model for predicting VFF and comparison with previous models

	Cut off*	Sensitivity	Specificity	AUC	PPV	NPV	LR+	LR-	odd ratio
Model 1 (with BMD)									
HHL > 1.5 cm + BMD FN < -1.7	5	83%	52%	0.67	42%	88%	1.73	0.33	5.23
Age > 65 yrs + HHL > 1.5 cm	6	79%	57%	0.68	43%	87%	1.82	0.38	4.84
Age > 65 yrs + BMD FN < -1.7	7	51%	81%	0.66	52%	80%	2.65	0.61	4.36
All parameters	9	43%	86%	0.65	56%	78%	3.09	0.66	4.67
Model 2 (without BMD)									
HHL > 1.5 cm	3	93%	32%	0.63	36%	92%	1.38	0.20	6.68
Age > 65 yrs	4	83%	52%	0.66	42%	88%	1.73	0.33	5.23
All parameters	7	51%	81%	0.66	52%	80%	2.65	0.61	4.36
FRAX MOF without BMD	10.00	12%	95%	0.53	48%	72%	2.23	0.93	2.40
FRAX HF without BMD	3.00	30%	85%	0.57	44%	75%	1.94	0.83	2.33
OSTA	-1.00	76%	42%	0.59	35%	81%	1.29	0.58	2.21
	-4.00	30%	82%	0.56	41%	74%	1.68	0.85	1.98
KKOS	-1.00	72%	46%	0.58	35%	80%	1.31	0.63	2.09
ISCD 2019 model with BMD	none	60%	68%	0.64	44%	81%	1.89	0.58	3.24

*cut off value in this model was calculated from the sum of individual risk score according to original reported for other models, AUC; area under the curve, PPV; positive predictive value, NPV; negative predictive value, LR+; positive likelihood ratio, LR-; negative likelihood ratio,

Conclusion: BMD and VFF screening should be eligible for individual women; age > 65 y and HHL > 1.5 cm regardless of BMD. VFA should be included in an individual woman with femoral neck T-score < -1.7 with HHL > 1.5 cm or age > 65 y.

P1067
CALCIUM INTAKE DEFICIT: A REALITY WE MUST FACE

P. E. Sanchez Marquez[1], A. Anacona[2]

[1]Meta, [2]EPS Sura, Medellin, Colombia

Objective: To evaluate calcium intake in a randomized population of Medellín and its metropolitan area, Colombia.

Methods: A descriptive, observational, cross-sectional cohort study was carried out with prospective data collection. The sample was obtained by convenience, from volunteers over 18 years of age in Medellín and its metropolitan area. The calcium intake questionnaire of the International Osteoporosis Foundation was completed between June-November 2022. We stratified by gender, age and socioeconomic level In those who received calcium or vitamin D supplements we evaluated if their indication was therapeutic or preventive.

Results: 452 volunteers participated. 356 women (78.7%), with an average age of 47.3 y (IQ25-70 34–61) and 42.3 (IQ25-70 31–50.2) y for men. Mean calcium intake was 835 mg/d (IQ25-75 586–982 mg/d). For women it was 812.9 mg/d (IQ25-75 567–975 mg/d), being 794.7 mg/d, 816.5 mg/d and 817.2 mg/d for women in the range of

18–30, 31–50 and older than 50 y. In men the average consumption was 918.3 mg/d (IQ25-75 717.5–1017 mg/d), being 972.6 mg/d, 911.9 mg/d and 880.6 mg/d for men in the range of 18–30, 31–50 and older than 50 y. Adequate calcium intake for age was documented in 21% of the volunteers, with an average intake of 1363 mg/d among them (IQ25-75 1123–1458 mg/d), of which 45.3% had calcium supplementation and the remaining 54.7% did not. Of the 78.9% of the volunteers who didn't have adequate intake, they had an average daily consumption of 694 mg/d (IQ25-75 520–879 mg/d). Of these, 10.9% had calcium supplementation and the remaining 89% did not. The average calcium intake in women and men from low socioeconomic stratum was 657 mg/d (IQ25-75 336–915 mg/d) and 650 mg/d (IQ25-75 452–734 mg/d) respectively, 656.8 mg/d (IQ25-75 499–717 mg/d) and 742 mg/d (IQ25-75 596–771 mg/d) in middle socioeconomic stratum and 1008.1 mg/d (IQ25-75 837–1117 mg/d) and 1040.9 mg/d (IQ25-75 878–1123 mg/d) in high socioeconomic stratum.

Conclusion: In patients who were taking calcium supplements, the main indication was prevention, 56% in women and 73% in men. The remaining 44% and 27% were indicated for treatment, mainly as part of osteoporosis treatment. Substitution is more frequent in high socioeconomic stratum (54.5%). In patients with vitamin D supplementation, the main indication was prevention, which was 70% for women and 77% for men. The remaining 30% and 23% were indicated for the treatment of low serum levels of vitamin D. Supplementation is more frequent in upper socioeconomic stratum, (62% in women and 77% in men).

P1068
HYPOPARATHYROIDISM: PROFOUND INCREASE IN BONE TURNOVER MARKERS AND HYPERCALCEMIA DURING LACTATION AFTER THE FIRST AND SECOND BIRTH

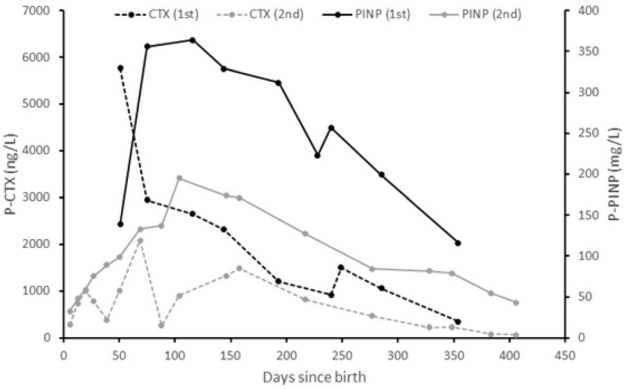
P. Eiken[1], L. Tjelum[2], R. Nolsoe[2], L. Rejnmark[3], N. R. Jørgensen[4]

[1]Dept. of endocrinology/Bispebjerg hospital, Copenhagen, [2]Endocrinology/North Zealand Hospital, Hillerød, [3]Institute of Clinical Medicine/Århus Univ. Hospital, Århus, [4]Dept. of Clinical Biochemistry, Copenhagen Univ. Hospital Rigshospitalet, Copenhagen, Denmark

Objective: Changes in bone turnover markers (BTM) and calcium levels during lactation following two pregnancies in a patient with hypoparathyroidism.

Methods: A 31-year-old woman with hypoparathyroidism following a total thyroidectomy due to thyroid cancer. She was treated with calcium supplements and activated vitamin D and became pregnant 4 y later.

Results: She gave birth twice to healthy children with three years in between. After both pregnancies, she developed (asymptomatic) hypercalcemia despite stopping calcium supplements and active vitamin D. BTM (Figure, 1st and 2nd pregnancy) showed a marked increase in CTX and P1NP after both pregnancies. CTX levels peaked 1.5–2 months after delivery and decreased thereafter, while P1NP continued to increase to a maximum of 2.5–3 months after delivery and remained high for months before gradually declining and returning to normal after cessation of lactation. The bone markers were 1000-fold higher after the first delivery compared to the second delivery. The elevation of BTM persisted for months even after plasma calcium had normalized. Active vitamin D was gradually initiated and 7–8 months after delivery, the patient was back on her full pre-pregnancy dose of active vitamin D.



Conclusion: The patient had an enormous increase in BTM after the first pregnancy, which returned to very low levels (which is normal for hypoparathyroidism) between the two pregnancies. Increased levels of BTM are probably explained by the synthesis of PTH-related peptides during pregnancy and breastfeeding. The increase in BTM after the second delivery was less pronounced and associated with less pronounced hypercalcemia. Despite closely monitoring the patient and stopping standard-of-care therapy, we were unable to prevent hypercalcemia after childbirth. Careful monitoring of calcium levels weekly is recommended for patients with hypoparathyroidism after childbirth.

P1069
RELATION BETWEEN DEFICIENCY OF VITAMIN D AND RISK OF OSTEOPOROTIC VERTEBRAL FRACTURES: A STUDY IN INDIAN FEMALE POPULATION

P. G. Kakadiya[1]

[1]Shayona Advanced Spine Care, Surat, India

Objective: To determine serum 25-hydroxyvitamin D level and its association with osteoporotic thoracolumbar junction vertebral fracture in elderly patients of India.

Methods: From June 2018 to Dec 2020, this retrospective case–control study included 267 patients with primary osteoporotic thoracolumbar junction vertebral fracture (T10–L2) and 285 elderly patients with back pain (without osteoporotic vertebral fracture) as controls. Serum vitamin D levels were measured and the association with osteoporotic vertebral fracture was analysed. Other clinical data, including BMI, comorbidities, and BMD, were also collected and compared between these two groups.

Results: It was shown that vitamin D levels were significantly lower in patients with T10–L2 vertebral fracture than in control patients. Among 267 vertebral fracture patients, 78.1% of patients showed grade 2–3 fractures. Serum 25-hydroxyvitamin D levels were significantly related to affected vertebral numbers and vertebral fracture severities. The vertebral fracture risk was 28% lower (OR = 0.72, 95%CI 0.62–0.83) per increased Standard deviation in serum 25-hydroxyvitamin D. Compared with the 1st quartile (mean 25-hydroxyvitamin D: 29.67 $\pm$ 6.18 nmol/L), the vertebral fracture risk was significantly lower in the 3rd (mean 25-hydroxyvitamin D: 60.91 $\pm$ 5.12 nmol/L) and 4th quartiles (mean 25-hydroxyvitamin D: 103.3 $\pm$ 44.21 nmol/L), but not in the 2nd quartile (mean 25-hydroxyvitamin D: 45.40 $\pm$ 3.95 nmol/L). In contrast, the vertebral fracture risk was significantly increased in the first quartile (OR = 1.87, 95%CI 1.42–2.45) compared with the 2nd–4th quartiles.

Conclusion: Vitamin D deficiency/insufficiency was associated with the risk of osteoporotic thoracolumbar junction vertebral fractures in elderly patients.

P1070
VITAMIN D DEFICIENCY AND OSTEOPOROSIS AMONG POSTMENOPAUSAL INDIAN WOMEN WITH DEGENERATIVE LUMBAR SPINE DISEASE UNDERGOING SPINE FIXATION SURGERY

P. G. Kakadiya[1]

[1]Shayona Advanced Spine Care, Surat, India

Objective: Several epidemiological studies have shown a lower prevalence of osteoporotic Spine fractures in patients with degenerative spine disease. Other studies have demonstrated elevated BMD in patients with degenerative spine disease. The prevailing view is that degenerative spine disease and osteoporosis may have an inverse relationship. The purposes of the present study were to describe a subgroup of patients with degenerative spine disease who were found to have osteoporosis and to assess the vitamin-D status and other risk factors for low bone density in degenerative spine disease subjects with and without osteoporosis.
Methods: A Retrospective study including 136 Indian postmenopausal women. The BMD of the spine, the proximal part of the femur, and the total body were measured with dual-energy x-ray absorptiometry in 136 postmenopausal white women who were scheduled to undergo spine fixation and decompression surgery for degenerative spine disease. The serum levels of 25-hydroxyvitamin D, 1,25-dihydroxyvitamin D, intact PTH, osteocalcin, and bone-specific alkaline phosphatase and the urinary level of N-telopeptide were measured. Information from validated lifestyle, dietary, and demographic questionnaires was also evaluated.
Results: 34 (25%) of the 136 women had occult osteoporosis (as indicated by a T-score of less than -2.5). 30 (22%) subjects had vitamin D deficiency, and 6 (4%) had an elevated serum PTH level. Only 4 of the 34 osteoporotic women had vitamin D deficiency. On the basis of these numbers, vitamin D status was not correlated with bone density ($p = 0.32$). Analysis of the relationship between the number of years since menopause and osteoporosis or markers of elevated bone turnover showed that osteoporosis was detected throughout the postmenopausal period.
Conclusion: 136 Indian women with degenerative spine disease had occult osteoporosis and hypovitaminosis D. Vitamin D deficiency was not restricted to the group with low bone density. These results support the need to consider the presence of both osteoporosis and vitamin D deficiency in women with degenerative spine disease.

P1071
METABOLIC MYSTERY OF OSTEOPOROTIC VERTEBRAL FRACTURE IN INDIAN PATIENTS: A HISTOMORPHOMETRIC AND BIOCHEMICAL CORRELATION

P. G. Kakadiya[1]

[1]Shayona Advanced Spine Care, Surat, India

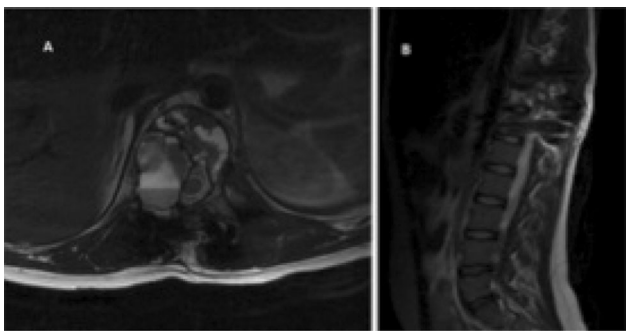
Objective: A high prevalence of hypovitaminosis D is being reported in Indian patients with osteoporotic vertebral fractures. The gold standard to diagnose osteoporosis and osteomalacia is bone histomorphometry. There is no study evaluating histopathological histomorphometry in Indian Osteoporotic vertebral fracture patients. The purpose of the study was to evaluate osteoporotic vertebral fracture patients for histopathological osteomalacia and osteoporosis by histomorphometry and to correlate histopathological findings with biochemical hypovitaminosis D.
Methods: A total of 110 patients with osteoporotic vertebral fractures were included in the prospective cross-sectional study. During definitive fracture fixation of these osteoporotic vertebral fractures, bone biopsy was taken from the fractured vertebral body by a novel approach for histomorphometry. Histomorphometric analysis was based on 3 indices, namely osteoid seam width, osteoblast surface, and osteoid surface. We also analysed blood-bone biochemistry and correlated it with bone histomorphometry.
Results: In osteoporotic vertebral fractures patients, the prevalence of histomorphometric osteoporosis and osteomalacia were very low (only 9.4% had osteoporosis and none had osteomalacia) however in blood bone biochemistry, we found a high prevalence (85.5%) of hypovitaminosis D. We also noted significant changes when correlated bone histomorphometry with different blood bone biochemistry.
Conclusion: Patients with osteoporotic vertebral fractures were found to have a high prevalence of biochemical hypovitaminosis D but unlike Western literature, there was a low prevalence of histomorphometric osteoporosis with no evidence of histomorphometric osteomalacia. Correct knowledge about the metabolic status of osteoporotic vertebral fractures is required to improve outcomes, decrease complications and optimise the cost of the treatment.

P1072
ANEURYSMAL BONE CYST WITH SCOLIOSIS: UNUSUAL PRESENTATION

P. G. Kakadiya[1]

[1]Shayona Advanced Spine Care, Surat, India

Aneurysmal bone cysts are benign bone tumours that not uncommonly involve the spine. However, this involvement can cause scoliosis rarely. This case report focuses on the importance of proper management for complete tumour resection to prevent recurrence and spinal deformity.
Case report: A 13-year-old Indian boy, with a history of T11 aneurysmal bone cyst resection and bone grafting carried out at another hospital, presented with a spine deformity of four months' duration. The deformity was not associated with pain or neurological deficit. A whole-spine MRI with contrast confirmed the recurrence of the aneurysmal bone cyst. Posterior spinal instrumentation with corpectomy of T11 was then performed and confirmed with histopathology the recurrence of aneurysmal bone cyst. Two years post-corpectomy, deformity correction was done from T5–L4.



Conclusion: Management of aneurysmal bone cysts requires meticulous planning and full excision to prevent a recurrence, especially in the growing spine. If neglected, it can cause major spinal deformities and cord compression, which places a medical burden on the patient and family. To avoid such complications, treating aneurysmal bone cysts along with scoliosis correction can prevent deformity progression.

P1073
A RARE GENETIC DISORDER: GONADAL DYSGENESIS WITH MAYER ROKITANSKY KÜSTER HAUSER SYNDROME

P. G. Kakadiya[1]

[1]Shayona Advanced Spine Care, Surat, India

46,XX gonadal dysgenesis is a rare genetically heterogeneous disorder characterized by underdeveloped ovaries with consequent impuberism, primary amenorrhea, and hypergonadotropichypogonadism. Mullerian agenesis or Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome is characterized by congenital aplasia of the uterus and the upper part (2/3) of the vagina in a woman with normal development of secondary sexual characteristics and a normal 46,XX karyotype. An association between these two conditions is very exceptional and appears to be coincidental, independent of chromosomal anomalies. Here, we report a case of 46,XX gonadal dysgenesis and MRKH syndrome.

Case report: A 15 year 9 month old female patient presented to our hospital with complaints of primary amenorrhea and absence of secondary sexual characteristics. There was no family history of consanguinity, miscarriages, neonatal deaths, or any other family member with primary amenorrhea. Her birth, perinatal, and neonatal periods were uneventful. No history of developmental delay. No history was suggestive if systemic illness. Her height was 148.5 cm (10th centile) and her weight 38 kg with normal intelligence. Her pulse rate was 86 beats/min and her blood pressure was 100/70 mm of mercury. Scoring of pubic, axillary hair growth, and breast development were Tanner's Stage 1. External genital examination revealed normal labia majora and minora, normal clitoris. There was no facial dysmorphism, webbing of neck, or wide carrying angle. Echocardiography revealed normal chamber dimensions with no other cardiac abnormalities, and abdominal ultrasound examination revealed single horseshoe-shaped kidney at ectopic location and absence of uterus and ovaries suggestive of MRKH type B. The abdominal ultrasound findings were confirmed later by MRI of the abdomen and pelvis revealing the bladder and rectum without interposition of the uterus. Bilateral ovaries are also not seen in the adnexa. Fundus examination and pure tone audiometry were normal. Karyotyping revealed normal 46,XX complement. Her hemogram, renal and liver function tests were also normal. Endocrine evaluation revealed elevated levels of follicle-stimulating hormone (74 IU/L) and luteinizing hormone LH (45 IU/L) with low estradiol (< 5 pg/ml) levels. Her blood sugar, thyroid function tests, serum cortisol, and prolactin levels were normal. Hormonal therapy with ethinyl estradiol 10 mg/d was started for the development of secondary sexual characteristics and to prevent osteoporosis. There remains the unsolved problem of infertility.

Discussion: The paramesonephric ducts develop lateral to the gonads and play an essential role in the development of uterine tubes, the uterus, the superior part of the vagina and broad ligaments. Estrogens may influence the development of the paramesonephric system. The absence of Mullerian-inhibiting substance is also essential for its development. Mutations of the gene encoding the anti-Mullerian hormone receptor and the lack of estrogen receptors during embryonic development have been hypothesized to cause MRKH syndrome. An undifferentiated gonad may produce anti-Mullerian hormone in an earlier embryologic period. But this hypothesis cannot be valuable without the presence of the chromosome Y. Occurrence of these two conditions compromises fertility both in the mechanic and hormonal way.

P1074
A COMPARISON OF DIFFERENT SCREENING TOOLS FOR PREDICTING OSTEOPOROSIS IN COMMUNITY-DWELLING POSTMENOPAUSAL WOMEN IN INDIA

P. G. Kakadiya[1]

[1]Shayona Advanced Spine Care, Surat, India

Objective: DXA is the gold standard in diagnosing osteoporosis. However, screening all postmenopausal women (PMW) for osteoporosis is not feasible in clinical practice. Questionnaire-based screening tools have still not been validated in Indian settings. This cross-sectional study aimed to assess the performance of various osteoporosis screening tools (OSTA, ORAI, SCORE, ABONE, BW, OSIRIS) in the prediction of osteoporosis in PMW.

Results: We enrolled 190 healthy middle-class community-dwelling postmenopausal women (mean age 61.09 $\pm$ 6.5 y, range 50–86 y). The mean age of menopause was at 46.21 $\pm$ 4.9 y. The mean BMI was 27.92 $\pm$ 4.72 kg/m^2. Self-reported fracture was present in 26.8% of patients. BMD parameters showed osteoporosis in 63 (38.7%); osteopenia in 54 (33.1%) and normal in 46 patients (28.2%). Vitamin D deficiency (serum 25OHD < 20 ng/ml) was present in the majority (48.7%) of subjects. Clinically applicable screening tools for osteoporosis status were ABONE (AUC: 0.628) followed by the ORAI (AUC: 0.608, specificity 41%, Sensitivity- 97%).

Conclusion: ABONE and ORAI clinical risk instruments demonstrate high sensitivity for predicting osteoporosis in PMW. These can help us identify individuals at high risk for osteoporosis and prioritize them for DXA scanning.

P1075
EFFICACY OF A PILOT SCREENING PROGRAM FOR FRACTURE RISK EVALUATION IN POSTMENOPAUSAL WOMEN IN TWO CENTERS IN POLAND

K. Turzanska[1], T. Blicharski[1], A. Mozdzen[1], A. Nowakowska-Plaza[2], E. Zielinska[2], J. Tomasiuk[2], M. Stasiek[2], T. Sadura-Sieklucka[2], P. Gluszko[2]

[1]Dept. of Rehabilitation and Orthopaedics, Medical Univ. of Lublin, Lublin, [2]Dept. of Rheumatology, National Institute of Geriatrics, Rheumatology and Rehabilitation, Warsaw, Poland

Objective: Current epidemiological data from the Polish National Health Fund indicate that over 80% of patients remain undiagnosed with osteoporosis, and over 90% do not receive appropriate pharmacological treatment. To strengthen collaboration between primary health care units, hospitals, and specialist centers focused on the diagnosis and treatment of osteoporosis, the first Operational Program Coordination for the Prevention of Osteoporotic Fractures (POWER) was implemented in Poland in the years 2019 -2023. In this study, we present a preliminary analysis of the results of simple screening tests used in this program to detect women at risk for fractures or who already have fractures.

Methods: The POWER program was carried out by four centers in four macroregions of Poland, screening by June 2023, 9309 women aged 50–70 y who had never previously been diagnosed with osteoporosis. Simple screening tests for the assessment of risk factors for fractures like BMI measurement, risk calculation with FRAX PL, and an interview regarding falls and bone fractures were carried out in primary health care units and orthopedic departments, and women with low-energy fractures or with medium or higher risk assessed by FRAX were referred to specialist centers for further diagnostics including DXA and X-ray examination. In the National Institute of Geriatrics, Rheumatology, and Rehabilitation in Warsaw, the center

selected for this study, cooperating with 44 primary care units, 3819 women were screened. In the Independent Public Hospital No. 4 in Lublin, working in conjunction with 47 primary care clinics, a similar analysis of the screening results of 2051 women was performed.
Results: In the Warsaw center and cooperating units in central Poland, the FRAX PL calculator revealed a medium or high probability of fractures in 19.9% (762 women). Subsequent DXA densitometric examinations confirmed osteoporosis in 30.8% of these patients, while 43.3% were diagnosed with osteopenia. Furthermore, low-energy fractures were identified in 237 women. Lublin Center (eastern Poland): Out of the participants, 55% (1128 women) progressed to the second stage of the study based on a medium or high probability of fractures in FRAX. Ultimately, 1051 patients (52%) underwent evaluation at the specialist medical center. Within this group, DXA examination disclosed osteoporosis in 34% of the women assessed, and osteopenia was identified in 32%. Additionally, 138 women were diagnosed with previously unknown low-energy fractures.
Conclusion: The observations currently analyzed in two program centers only confirm the results reported in comparable international studies. Our data support recommendations for highly effective, simple, and low-cost screening procedures aimed at identifying people at risk of osteoporotic fractures and, notably, in a relatively younger group of women. Further research on screening errors, false positive or negative diagnoses, and methods of improving cooperation with primary care units and orthopedic hospitals are being conducted.

P1076
CONOTOXINS FROM SEA SNAILS VENOM AS BONE REMODELING DISRUPTORS

B. Iduarte-Frías[1], P. Fournier[1], A. Licea[1], P. Juarez[1]

[1]Centro de Investigación Científica y de Educación Superior de Ensenada, Ensenada, Mexico

Objective: Disruption of bone remodeling results in an imbalance between bone formation and resorption, leading to osteoporosis. New molecules that can effectively modulate bone remodeling are needed. Conotoxins, small peptides from the venom sea snails, exhibit high affinity and selectivity for ion channels that are also present in bone cells. Thus, we aimed to characterize the effects of two synthetic conotoxins on osteoclasts, osteoblasts, and osteocytes in vitro and ex vivo.
Methods: Transcriptomic analysis of osteoblast treated with conotoxin revealed a significant downregulation of multiple genes associated with ossification, skeletal development, bone development, bone mineralization, and osteoblast differentiation. Then, we tested the effects of conotoxins in OB and OC in vitro.
Results: We found conotoxins were able to decrease the mineralization of mice osteoblasts ($p < 0.001$) while increasing the differentiation of mouse bone marrow cells into osteoclasts when stimulated with RANKL and M-CSF ($p = 0.001$). Also, treatment with conotoxin significantly increased osteoclast resorption activity ($p = 0.001$). Our data also indicated that this pro-osteoclastic effect was RANKL-dependent. Real-time qPCR (RT-qPCR) revealed that conotoxins downregulated the expression of osteoblastic genes Runx2 ($p = 0.027$), Alpl ($p = 0.006$), and Col1a1 ($p = 0.001$) while upregulating osteoclastic genes such as Nfatc1 ($p = 0.015$) and RANK ($p = 0.048$). Additionally, conotoxins modulated the expression of nAChR ($p = 0.015$) on bone cells. We tested the effect of conotoxins on an ex vivo calvaria culture model; histological analysis indicated a significant decrease in bone area ($p = 0.005$) and an increase in the number of osteoclasts ($p = 0.001$) in conotoxin treated calvaria. Lastly, we evaluated the effect of conotoxins on gene expression in osteocyte-enriched bone, and RT-qPCR indicated an upregulation of the expression of Dmp1 ($p = 0.0015$), Sost ($p = 0.002$), Rankl ($p = 0.002$).
Conclusion: The evaluated conotoxins disrupt bone remodeling, affecting bone cell differentiation and activity in vitro and ex vivo. These results suggest using conotoxins as a combined therapy to modulate resorptive therapies.

P1077
LONG-TERM FOLLOW-UP OF PATIENTS WITH RHEUMATOID ARTHRITIS: EMPHASIS ON BONE MINERAL DENSITY

P. Kovalenko[1], I. Dydykina[1], A. Smirnov[1], S. Glukhova[1]

[1] V. A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To assess the dynamics of BMD with long-term observation of patients with rheumatoid arthritis.
Methods: 107 women with rheumatoid arthritis (RA) (ACR 1987, EULAR/ACR 2010) were included in an open-label, prospective, cohort study, the average age was 63.7 ± 8.3 y, RA duration at baseline 14.3 ± 9.8, who underwent an outpatient or inpatient examination in 2010–2014 (follow-up duration was 9.5 ± 1.9 y). A generally accepted clinical examination was performed, X-ray densitometry with measurement of MD in the lumbar spine (L1-L4), femoral neck (FN), proximal hip (PH) was performed at baseline and in dynamics, thoracic and lumbar spine X-rays were performed in lateral projection with assessment of vertebral deformations by Genant method (a decrease in the height of the vertebra by 20% or more was considered as a fracture and is described below as vertebral body index < 0.8).
Results: In general, during the period the L1-L4 did not change significantly: 0.896 ± 0.155 vs. 0.894 ± 0.158 g/cm^2. Significant ($p < 0,05$) negative dynamics of BMD in HN and PH in the whole group was established: 0.683 ± 0.119 and 0.632 ± 0.107 g/cm^2 (for HN) and 0.789 ± 0.139 and 0.754 ± 0.142 g/cm^2 (for PH). There was a significant ($p < 0.05$) increase in the number of patients with vertebral deformations (fractures): from 17 (16%) to 52 (48%) in the thoracic and from 7 (6%) to 13 (12%) in the lumbar region and an increase in the degree of deformation in these regions: the vertebral body index decreased from 0.77 ± 0.07 to 0.73 ± 0.1 and from 0.74 ± 0.08 to 0.7 ± 0.1, respectively. In the group of patients with lumbar deformations (n = 13), there was a trend towards an increase in BMD of L1-L4: from 0.911 ± 0.195 to 0.936 ± 0.206 g/cm^2, in contrast to the group of patients without deformations: 0.894 ± 0.149 and 0.884 ± 0.151 g/cm^2, respectively. Due to the expected association with age, patients were divided into groups by age at inclusion. In the group "baseline age $\geq$ 55 years" (n = 63), an increase in BMD of L1-L4 was detected: 0.870 ± 0.146 vs. 0.898 ± 0.164 g/cm^2 ($p = 0.02$). While the group "baseline age $<$ 55 years" (n = 44) showed a decrease in BMD L1-L4: 0.870 ± 0.146 vs. 0.898 ± 0.164 g/cm^2 ($p = 0.0003$). In patients taking glucocorticoids (at baseline or at the time of re-examination), there was a tendency for an increase in BMD in the L1-L4; in patients who did not take glucocorticoids, there was a tendency for a decrease in BMD. A significant decrease in HN and PH was recorded regardless both of glucocorticoids administration (at baseline or at the time of re-examination) and the age at inclusion (younger/older than 55 years).
Conclusion: A preliminary analysis of the results of long-term follow-up showed that regardless of the baseline age of patients and the administration of glucocorticoids, there was a significant decrease in BMD in the femoral neck and proximal hip. An increase in BMD in the L1-L4 was observed in older patients (at baseline) and seems to be associated with an increase in compression deformations of the

vertebrae of this department, in contrast to younger patients who had a decrease in BMD in the L1-L4.

P1078
LONG-TERM FOLLOW-UP OF PATIENTS WITH RHEUMATOID ARTHRITIS: EMPHASIS ON VERTEBRAL DEFORMATIONS

P. Kovalenko[1], I. Dydykina[1], A. Smirnov[1], S. Glukhova[1]

[1] V. A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To assess the dynamics of vertebral deformations in patients with rheumatoid arthritis with long-term observation.
Methods: 107 women with rheumatoid arthritis (RA) (ACR 1987, EULAR/ACR 2010) were included in an open-label, prospective, cohort study, the average age was 63.7 ± 8.3 y, RA duration at baseline 14.3 ± 9.8, who underwent an outpatient or inpatient examination in 2010–2014 (follow-up duration was 9.5 ± 1.9 y). A generally accepted clinical examination was performed, at baseline and in dynamics thoracic and lumbar spine X-rays were performed in lateral projection with assessment of vertebral deformations by Genant method (a decrease in the height of the vertebra by 20% or more was considered as a fracture and is described below as vertebral body index < 0.8).
Results: During the observation period, 35 (33%) patients experienced the occurrence of vertebral deformation (fracture) or increase in the existing baseline deformation. There was a significant ($p < 0.05$) increase in the number of patients with vertebral deformations (fractures): from 17 (16%) to 52 (48%) in the thoracic and from 7 (6%) to 13 (12%) in the lumbar site and an increase in the degree of deformation in these regions: the vertebral body index decreased from 0.77 ± 0.07 to 0.73 ± 0.1 and from 0.74 ± 0.08 to 0.7 ± 0.1, respectively. Due to the expected association between patients' age and the presence/severity of deformations, patients were divided into groups by age at the time of inclusion. According to the average daily, cumulative dose of glucocorticoids at baseline/over time, the duration of glucocorticoids administration—groups did not differ. Only in the group "baseline age ≥ 55 years" (n = 63) there was a significant ($p < 0.05$) increase in deformations of the thoracic and lumbar sites: vertebral body index decreased from 0.76 ± 0.09 to 0.73 ± 0.1 in the thoracic and from 0.73 ± 0.08 to 0.68 ± 0.12 in the lumbar regions. Whereas in the group "baseline age < 55 years" (n = 44), significant ($p < 0.05$) increase in deformations was noted only in the thoracic site: 0.79 ± 0.02 to 0.74 ± 0.1. In both groups, there was a significant increase in the number of patients with deformations in both departments. Due to the small number of subgroups when separating patients with deformities depending on glucocorticoid intake, no reliable statistical data were obtained, the data are not provided.
Conclusion: A preliminary analysis of the results of long-term follow-up showed a significant increase in the number of patients with vertebral deformations (fractures) in both sites regardless of the baseline age of patients. Baseline age at inclusion influenced the severity of the deformations. In older patients (baseline), there was a negative change in the degree of deformity in both parts of the spine, while in younger patients (baseline)—only in the thoracic site. A larger sample is needed to assess the impact of glucocorticoids.

P1079
EROSION COUNT DYNAMICS IN PATIENTS WITH RHEUMATOID ARTHRITIS WITH LONG-TERM FOLLOW-UP

P. Kovalenko[1], I. Dydykina[1], A. Smirnov[1], M. Diatroptov[1], S. Glukhova[1]

[1] V. A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To assess erosion count dynamics in patients with rheumatoid arthritis with long-term follow-up.
Methods: 107 women with rheumatoid arthritis (RA) (ACR 1987, EULAR/ACR 2010) were included in an open-label, prospective, cohort study, the average age was 63.7 ± 8.3 y, RA duration at baseline 14.3 ± 9.8, who underwent an outpatient or inpatient examination in 2010–2014 (follow-up duration was 9.5 ± 1.9 y). At baseline and in dynamics there were performed a generally accepted clinical examination, X-ray of hands and feet in direct projection (with Sharp/Van der Heide assessment), immunological analysis of ACCP (cyclic citrullinated peptide antibodies), RF (rheumatoid factor), CRP (C-reactive protein), IL-6, MMP-3 (matrix metalloproteinase-3) as well as osteoimmunological markers (osteocalcin, osteoprotegerin, RANKL, CTX-1, BAP (bone alkaline phosphatase)) were determined.
Results: In general, during the period the group showed a significant ($p < 0.0001$) increase in erosion count: 16.0 [3.0; 44,0] vs. 16,0 [5,0; 64.0] Me [25%; 75%]. An increase in erosion count was observed in 54 patients, while stabilization of this indicator was observed in 48 people. When comparing these groups of patients (with increase (group 1) or stabilization of erosion count (group 2) over the study period), it was found that in group 1 there were initially younger patients: 52.9 ± 9.9 vs. 56.3 ± 7.1 y ($p = 0.02$). In group 1 (increased erosion count), patients were significantly more often were positive for the RF and ACCP: 44 (81.5%) vs. 24 (50%) ($p = 0.0007$) and 42 (77.8%) vs. 28 (58.3%) ($p = 0.03$), respectively. At baseline, patients in group 1 had higher levels of MMP-3 and IL-6 than in group 2: 55.5 [19.5; 119,5] vs. 23,8 [14; 68] ng/mL ($p = 0.02$)—for MMP-3 and 7.5 [2.9; 21,8] vs. 5,9 [0,3; 9.6] pg/mL ($p = 0.01$)—for IL-6. Correlation analysis also revealed a valid association between erosion count at baseline and baseline level of MMP-3, IL-6. In dynamics the examination revealed a direct relationship between erosion count and MMP-3 level.
Conclusion: A preliminary analysis of the results of long-term observation of patients with RA, younger age, positivity in the RF and ACCP showed that higher baseline MMP-3 and IL-6 levels are associated with an increase in erosion count.

P1080
PATIENT'S FEELINGS REGARDING THE FUTURE OF RHEUMATOLOGY

P. Lemesle[1], X. Grapton[2], L. Poulain[3], N. Bouhedja[3]

[1]Hopital Rives de Seine Courbevoie, Courbevoie, [2]Hopital Suisse de Paris, Issy Les Moulineaux, [3]Private practice, La Garenne Colombes, France

Objective: Evaluate the evolution and outcome of rheumatology from the patients' perception.
Methods: 51 Rheumatologists (Rh) of CREER group (Ile de France) have interrogated their patients about their appreciation of

rheumatology private practice in 2023. 261 patients, Men(M) 20% / Women (W). 4 groups A: 10% < 39 yo; B 26% < 40–59 > ; C 49% < 60–79 > ; D 15% > 79.

Results: Media, social network, and close circle influence is quoted on 3 levels. Access to information:—Media: moderate influence for all ages, -Social networks: Null for 50%, except A,—Social networks: Null for 50%, except A, -Social networks: Null for 50%, except A,-Close circle Important for all ages. Decision to accept the treatment: -Media: heterogenous for all ages, -Social network: Null for 50% except A, -Close circle: Important for all ages and mostly A. Internet search before Rh consultation by their symptoms: no 62%—Direct access to Rh: 35%. Referred by general physician: 54%—Teleconsultation: No 88%, M = W. Internet interrogation about the Rh, diagnosis (Dg) and treatment: No respectively 71%, 64%, 72%, M = W, except for RH and Dg. Previous treatment before RH: general physician, 27%, physical therapist 66%, osteopath 75%. Complete and sufficient Information given by Rh > 90%—Rh preferred for infiltration (no tomography and no X-rays) 81%—Osteoporosis (OP) is the Rh matter 80%, gynecologist 13%, M = W—Infiltrations by nurses (No: 80%), by pharmacist (No 85%), M = W—Generic substitution: No 57%

Conclusion: Patients are poorly influenced by media when it comes to medical decisions and even less by social networks including for the youngest. Close circle influence remains essential for all ages. Despite a complete information, the Rh comes in third position for a consultation. Rh is still the medical reference for OP and infiltrations which the transfer to nurses or pharmacists is unconceivable.

P1081
ABSENCE OF REBOUND INCREASE IN BONE TURNOVER MARKERS IN NON-OSTEOPOROTIC PATIENTS TREATED WITH HIGH DENOSUMAB DOSES FOR 6 MONTHS: A 30-MONTH PROSPECTIVE STUDY

P. Makras[1], A. Anastasilakis[2], M. Yavropoulou[3], A. Papatheodorou[1], S. Papapoulos[4]

[1]251 Hellenic Air Force & VA General Hospital, Athens, Greece, [2]424 General Military Hospital, Thessaloniki, Greece, [3]National and Kapodistrian Univ. of Athens, Athens, Greece, [4]Leiden Univ. Medical Center, Leiden, Netherlands.

Objective: The importance of length of treatment for the consequences of the overshoot of bone turnover markers following discontinuation of denosumab (Dmab) has been clearly shown in prospective studies of patients with osteoporosis. The contribution, however, of the total dose of administered drug to this response is currently unknown due to the lack of information of long-term changes of bone turnover after stopping Dmab given at doses higher than those used in the treatment of osteoporosis.

Methods: We addressed this question in a prospective, single-arm, open-label, multicenter, Phase 2b clinical trial of 10 non-osteoporotic adult patients with Langerhans Cell Histiocytosis (LCH; 8 with bone lesions) treated with Dmab 120 mg every 2 months for 6 months (4 injections / total dose 480 mg) and followed for 2 y after the last injection. During a total observation period of 30 months, we measured bone turnover markers at regular intervals and BMD annually.

Results: As recently reported, treatment was clinically very effective (80% regression of lesions, 10% stable disease, 10% development of a new lesion[1]). Following Dmab, bone turnover markers were reduced up to 90% from baseline values at 6 months. Thereafter, they started increasing at 6 months after the last injection, reached peak values at 12 months and decreased thereafter; a pattern very similar to that after the last injection of Dmab 60 mg for osteoporosis followed by uncompensated discontinuation. The peak values of serum CTX (0.522 ± 0.016 ng/ml) and P1NP (72.2 ± 11.4 ng/ml) were not significantly different from baseline values (p = 0.1109 and 0.6534, respectively). LS-BMD increased significantly by 3.93% during the first year and returned to baseline at the end of the study.

Conclusion: The highly efficacious treatment of adult LCH patients with Dmab was not followed by an overshoot of bone turnover markers or bone loss despite the administration within 6 months of a total dose equal to that given to patients with osteoporosis for 3.5 years. These results suggest that the total Dmab dose is not an important determinant of the "rebound" of bone turnover.

Reference: (1) Makras P, et al. Am J Hematol 2023;98:E168.

Disclosures:

PM reports lecture fees and research grants from Amgen; ADA and SEP report consulting/speaking fees from Amgen.

P1082
ASSOCIATION OF GENETIC MARKERS WITH CLINICAL CHARACTERISTICS IN PATIENTS WITH RHEUMATOID ARTHRITIS

P. Marozik[1], E. Rudenka[2], A. Rudenka[2], K. Kobets[1], V. Samokhovets[3]

[1]Institute of Genetics and Cytology NAS Belarus, [2]Belarusian State Medical Univ., [3]31st Minsk City Clinical Hospital, Minsk, Belarus

Rheumatoid arthritis (RA) is a multifactorial disease caused by environmental and hereditary factors. RA contributes to an increased risk of developing osteopenia and osteoporosis (OP), especially due to the use of certain antirheumatic drugs. Identification of individual genetic predictors of an increased risk of RA complications will allow timely adjustment of treatment and avoidance of adverse effects.

Objective: To identify the most significant polymorphic variants in genes associated with clinical and biochemical parameters in patients with RA.

Methods: The study included 262 people (128 controls and 176 patients with RA). Individuals included in the study underwent an outpatient examination at the 1st Minsk City Hospital (Belarus); all participants signed informed consent. Clinical examination of patients included collecting a history of the disease, measuring body length and mass, assessing the clinical picture of the disease, including the presence of systemic manifestations, filling out patient cards with counting the number of swollen (SJ) and painful joints (PJ). The BMD was evaluated using DXA. Genetic studies were carried out using real-time PCR of the following polymorphic variants of the genes *IL19* rs587776843, *ATIC* rs4673993 and rs2372536, *ABCB1* rs1128503 and rs1045642, *ABCG2* rs2231142, *AMPD1* rs17602729, *ITPA* rs1127354, *ADORA2A* rs 5,760,410 and rs2236624, *TLR4* rs4986790, *HLA-E* rs1264457, *NR3C1* rs258751, *ATP5F1E* rs1059150, *KLRD1* rs2302489, *GLCCI1* rs37973, *CRHR1* rs1876828, *ESR1* rs1801132, *PRL* rs7739889, IL6 rs1800795, CALCR rs1801197.

Results: Based on genotyping results, we found that in carriers of the C/C genotype for rs1801132 of the *ESR1* gene, the level of BMD of the femoral neck was statistically significantly lower in the group of patients (0.76 ± 0.01) compared to the control (1.02 ± 0.01, p = 0.048). An association was also established between the A/A genotype of the rs7739889 PRL gene variant and reduced femoral neck BMD in the patient group (0.77 ± 0.02) relative to the control group (1.12 ± 0.13, p = 0.033). A similar association was revealed for the A/A genotype of the rs1801197 variant of the *CALCR* gene and the rs1800795 C/C genotype of the *IL6* gene—they are also statistically significantly associated with a decrease in BMD of the femoral neck (0.76 ± 0.01 and 0.77 ± 0.02 in patients against 1.03 ± 0.02 in the control group, p = 0.025 and p = 0.038, respectively). In addition, a statistically significant association with the

likelihood of RA was established for the TLR4 rs4986790, HLA-E rs1264457, IL19 rs587776843 loci.
Conclusion: Analysis of the results of genotyping of patients with RA allowed us to establish a significant association with the likelihood of decreased bone mass of loci *ESR1* rs1801132 C/C, *PRL* rs7739889 A/A, *CALCR* rs1801197 A/A, *IL6* rs1800795 C/C, with the likelihood of developing RA – loci *TLR4* rs4986790, *HLA-E* rs1264457, *IL19* rs587776843. Application of this approach in practice will improve the effectiveness of prevention of RA and its complications and accelerate the transition to personalized medicine.

P1083
ROLE OF FRAILTY ON REHABILITATION SUCCESS IN AN ITALIAN ORTHOGERIATRICS UNIT

G. Caggiu[1], M. Monzio Compagnoni[1], P. Floris[2], M. Passamonte[2], F. De Filippi[3], P. Mazzola[4]

[1]Università degli Studi di Milano-Bicocca, Dept. of Statistics and Quantitative Methods, Milano, [2]Ospedale di Sondrio, ASST della Valtellina e dell'Alto Lario, Sondrio, [3]Società Italiana di Geriatria Ospedale e Territorio, Roma, [4]Università degli Studi di Milano-Bicocca, School of Medicine and Surgery, Monza, Italy

Objective: To investigate the influence of frailty and delirium on rehabilitation outcomes in an Italian Orthogeriatric Unit.
Methods: All patients admitted to the Orthogeriatrics Unit at Sondrio Hospital (Italy) from 2011–2019, having $\geq$ 70 y and a femur fracture were prospectively enrolled. Among these, only patients who signed an informed consent form were included and formed the cohort study. The assessment included demographic information, functional and cognitive statuses, comorbidity, medications, and factors related to the fracture (type, timing, anesthesia, surgery). We calculated a frailty index (FI) based on 16 variables, and patients were classified in four categories according to frailty: fit ($FI < 0.15$; reference category), pre-frail ($0.15 \leq FI \leq 0.24$), mildly frail ($0.25 < FI < 0.34$) and moderate-to-severely frail ($FI \geq 0.35$). Delirium was assessed according to the DSM-5 criteria.
Results: The study population included 818 subjects (mean age 85.6 $\pm$ 5.7 y, 83.3% females). The most represented comorbid conditions were hypertension (55.8%), cardiac disorders (34.6%) and dementia (21.6%). The average time to surgery was 1.9 $\pm$ 1.1 d, and 70.2% of patients were classified as ASA 3 (severe systemic disease) or higher, reflecting an overall high operative risk. The majority of patients experienced displaced fractures (89.7%) and underwent surgery (55.1% intramedullary nail, 38.3% hemiarthroplasty) in spinal anesthesia in 77.6% of cases. In terms of rehabilitation success, i.e., Rehabilitation Efficiency Index (REI) > 0.5, it is expected that nonagenarians show the lowest rate compared to younger age groups (59.5% vs. 78.6% and 73.2% of 70–79 and 80–89 y, respectively). However, more than age per se, a frail phenotype represents a stronger risk factor for poor rehabilitation outcomes (OR 0.14, 95%CI 0.07–026 for mild frailty; OR 0.30, 95%CI 019–0.47 for moderate-to-severe frailty), with similar results among those who experienced delirium.
Conclusion: Frailty is a modifiable risk factor, thus we encourage the adoption of preventive strategies to counteract this syndrome. When caring for frail patients with hip fracture, it is advisable to direct the efforts towards early mobilization and physiotherapy, in order to make early rehabilitation as efficient as possible.

P1084
REFINING OSTEOPOROSIS RISK PREDICTION VIA ENSEMBLE FEATURE SELECTION

P1084 Refining osteoporosis risk prediction via ensemble feature selection.

[1]Princess Srisavangavadhana College of Medicine, Chulabhorn Royal Academy, Laksi, Thailand.

P. Nonthasaen[1], P. Achararit.[1]

[1]Princess Srisavangavadhana College of Medicine, Chulabhorn Royal Academy, Laksi, Thailand.

Objective: To develop a robust osteoporosis risk prediction tool by evaluating diverse feature selection techniques on a dataset of 1537 patients with 40 clinical biomarkers and bone density measurements (He, 2022). The objective was to identify a concise panel of predictive variables for accessible risk assessment and preventive treatment guidance.
Methods: We leveraged a dataset comprising 39 features and compared three feature selection methods: ANOVA, recursive feature elimination (RFE), and Lasso regression. Subsequently, Logistic regression, SVM, and random forest models were trained on the full feature set, top 10 features per method, and overlapping features between methods. Model performance was evaluated by fivefold cross-validation on metrics including accuracy, precision, recall, F1 score, and ROC-AUC.
Results: The seven overlapping features ('AS', 'Calcitonin', 'Calcitriol', 'FN', 'FNT', 'TL', 'TLT') selected by all methods showed consistent predictive power. Logistic regression with these features achieved 83% accuracy, comparable to 84% with the top 10 Lasso features, where models trained on all 39 features performed worse. Precision, recall, F1 score, and ROC-AUC were also comparable or improved using just 7 vs. 10 features across models. Similar patterns were seen for other models, with the full feature sets showing degraded performance metrics compared to the concise panel, highlighting the value of an optimized panel.
Conclusion: This study demonstrates the power of combining multiple feature selection techniques, as the ensemble panel achieved comparable or better accuracy than the full 39 feature sets. By distilling the signal from a complex dataset, the ensemble strategy offers a targeted screening tool to guide clinical decision-making. Further external validation will determine the generalizability of this targeted screening approach for routine clinical application.
Reference: He L. Bone mineral density dataset; 2022.
Acknowledgement: This work was supported by Chulabhorn Royal Academy.

P1085
ASSESSING THE IMPACT OF CHRONIC KIDNEY DISEASE (CKD) AND TYPE 2 DIABETES MELLITUS (T2DM) ON TRABECULAR BONE SCORE (TBS) IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS: A PRE- AND POST-TREATMENT ANALYSIS

P. Pinijprapa[1], Y. Suwansri[1], T. Songpatanasilp[1], T. Tutaworn[1], O.-A. Phruetthiphat[1]

[1]Phramongkutklao Hospital, Bangkok, Thailand

Objective: Osteoporosis is a common health problem, especially in countries with an increasing elderly population. Although BMD is

widely used, TBS has the advantage of detecting missed osteoporotic bone cases by using a pixel method in DXA lumbar spine images, along with BMD. Currently, both type 2 diabetes mellitus (T2DM) and chronic kidney disease (CKD) can affect bone strength. However, no specific study has focused on the combined effect of T2DM and CKD on TBS in osteoporotic patients. This study aims to investigate the effect of CKD and T2DM on the efficacy of osteoporotic treatment by evaluating the change in TBS before and after treatment with anti-resorptive drugs in postmenopausal women. Primary objective: To assess the significance of CKD and T2DM in terms of TBS before and after treatment with anti-resorptive drugs in postmenopausal osteoporotic women. Secondary objective: To study the importance of detecting CKD and T2DM before and after treatment with anti-resorptive drugs in postmenopausal osteoporotic women using BMD as a tool for comparison.

Methods: 253 Thai postmenopausal osteoporotic women with a mean age of 71.77 ± 8.07 years who were treated with anti-resorptive drugs. L-spine TBS and L-spine BMD were measured in all patients. TBS values before and after treatment will be calculated and compared at 1 year and 2 years, respectively. The correlation between TBS and BMD in each model will also be assessed. Using statistical analysis, CKD, T2DM and drug administration will be evaluated for correlation with TBS and BMD results.

Results: Among 253 patients, 6 models were analyzed for the results of bone density changes from baseline to 2-y follow-up. In diabetes mellitus type 2, TBS showed significant differences between the diabetic and non-diabetic groups at the L3 level at both baseline and 2-y follow-up. For CKD, baseline BMD at the L2 and L4 levels, neck, and total hip showed significant differences, as did TBS and BMD at the L4 level at 2-y follow-up. The age factor was significantly different for BMD at the neck and total hip at all follow-up times. Combining both DM and CKD, TBS at the L3 level and BMD at the L4 level showed significant differences at both baseline and 2-y follow-up. Only BMD at the L2 level was significantly different at baseline. Summation of all three factors, at baseline, TBS at the L3 level and BMD at the L2 and L4 levels were significantly different, while average TBS, TBS at the L3 and L4 levels, and BMD at the L4 level showed significant differences at 2-y follow-up. Patients with more than two risk factors were significantly more likely to have worse BMD and TBS scores compared to patients with no risk factors. In addition, a comparison between injection group and oral medication group showed that the injection group had significantly improved in BMD at the average lumbar level, neck of femur, and L1 level at baseline and in BMD at the average, L1 to L4 level at 2-y follow-up.

Conclusion: Age, chronic kidney disease, and diabetes mellitus type 2 appear to be significant factors affecting bone quality in both the lumbar spine and hip, as assessed by BMD and TBS. In patients with multiple risk factors, more pronounced differences are observed at both baseline and 2-y follow-up. The injection group may demonstrate superior outcomes compared with oral medication, and BMD more clearly reveals the progression after the treatment compared to TBS.

P1086
RADIOFREQUENCY ECHOGRAPHIC MULTI SPECTROMETRY (REMS) AS AN ULTRASOUND METHOD FOR BONE QUALITY ASSESSMENT IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

P. Pisani[1], F. Conversano[1], F. A. Lombardi[1], F. R. Contaldo[2], G. Luceri[3], T. De Marco[3], E. Casciaro[1], M. Muratore[4], S. Casciaro[1]

[1]Institute of Clinical Physiology, National Research Council, [2]Dept. of Biological and Environmental Sciences and Technologies, Univ. of Salento, [3]R&D Dept., Echolight S.p.a., [4]ASL-LE, Ospedale Vito Fazzi, Lecce, Italy

Objective: Type 2 diabetes mellitus (T2DM) is a chronic, multifactorial disease characterized by persistent hyperglycaemia (high blood glucose levels) as a consequence of insulin resistance, resulting in the development of disabling health complications, such as bone fragility. Scientific literature shows both quality and quantity of bone have a strong relationship with T2DM, contributing to the increased risk of bone fragility fractures compared to nondiabetic subjects. Indeed, these patients, may fracture despite normal or even increased BMD. The bone alterations may be due to the effect of advanced glycosylation end products (AGEs) on collagen fibres and bone cells, this interaction causes a conformational alteration of the structure and of the bone strength. This study aims to use the REMS-based the Fragility Score (FS) parameter to evaluate the effect of T2DM on bone quality microarchitecture. The FS parameter is an indicator of skeletal fragility independent of BMD and ranging from 0–100 (100 indicates the maximum similarity with the fractured model, on the other hand, 0 indicates the maximum similarity with the healthy model).

Methods: A cohort of 30 Caucasian women with DMT2 were enrolled and compared with an equivalent group of healthy control women (HC) matched for age and BMI. All the patients underwent REMS scans on proximal femur and the difference of FS values between the two study groups was evaluated through t-test.

Results: The mean of age and BMI were respectively 67.9 ± 12.2 years and 24.9 ± 3.4 kg/m^2 for T2DM and 67.7 ± 12.1 y and 25.8 ± 3.7 kg/m^2 for HC. The FS values measured at the proximal femur was significantly higher in T2DM patients (46.2 ± 17.8) than those obtained by HC (41.8 ± 16.4). The mean difference between 2 group is equal to -4.37 ± 17.1.

Conclusion: As expected, an important bone quality impairment associated with T2DM has been measured. The obtained data demonstrate that REMS is a valid diagnostic tool for the monitoring of bone health status, thanks to its ability to assess bone quality, enhancing the diagnosis in T2DM patients.

P1087
USE OF TRABECULAR BONE SCORE TECHNIQUE (TBS) IN EXAMS BONE DENSITOMETRY (DXA) OF OSTEOPENIC DIABETIC PATIENTS FOR STRATIFICATION OF THE RISK OF FRAGILITY FRACTURES

P. Portinho[1]

[1]Hospital das Forças Armadas, Brasília, Brazil

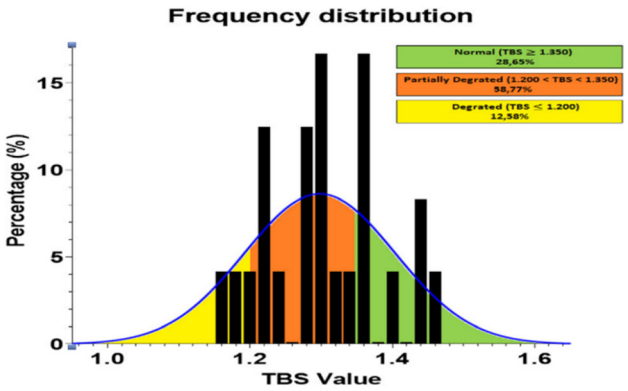
Objective: In 2015, in Brazil, there were 373 thousand fractures due to bone fragility(1). The mortality rate associated with a fragility femoral fracture in the elderly is 19.2% at 1 year (2).

The increased risk of fragility fractures is not only related to BMD, but also the quality of bone trabecular microarchitecture (3). TBS detects specific changes in bone quality related to trabecular microarchitecture, improving the diagnosis of the high risk of fragility fractures.

Diabetic patients present a deterioration in bone microstructure that is more evident in the composition of the disease (4). This study aimed to evaluate TBS in diabetic patients and stratify selected patients using TBS values in combination with BMD, in lumbar spine DXA acquisitions performed at HMAB in the period 2016 and 2020.

Methods: The sample included diabetic patients with the following inclusion criteria: men aged 70 years or over, women aged 60 or over; laboratory diagnosis of diabetes according to the criteria of the Brazilian Society of Diabetes; and DXA with osteopenia.

Results: 60 patients were evaluated; male (20%); female (80%); normal TBS 19 patients (28.65%), partially degraded 33 patients (58.775%) and degraded 08 patients (12.580%).



Conclusion: Diabetic patients develop degradation of bone microarchitecture in the lumbar spine, despite DXA showing good BMD.

References:

1. Aziziyeh R, et al. J M Economics 2019;22:638.
2. Sakaki MH, et al. Acta Ortop Bras 2004;12:242.
3. National Institute for Health and Care Excellence (NICE), 2012, www.nice.org.uk/guidance/cg146
4. Yamamoto M, et al. PLoS One. 2019;14:e0222571.

P1089
ZIYUGLYCOSIDE II ATTENUATED OVX MICE BONE LOSS VIA INFLAMMATORY RESPONSES AND REGULATION OF GUT MICROBIOTA AND SCFAS

Y. Zhou[1], L. Hu[1], T. Zhou[1], Q. Dong[2], P. Sun[1]

[1]The First Affiliated Hospital of Guangdong Pharmaceutical Univ., Guangzhou, [2]Yunfu Hospital of Traditional Chinese Medicine, Yunfu, China

Objective: Osteoporosis (OP) is a frequent clinical problem for the elderly. Ziyuglycoside II (ZGS II) is a major active compound of Sanguisorba officinalis L. that has shown anti-inflammation properties. The purpose of our research is to investigate the mechanism of ZGS II in ameliorating bone loss by inflammatory responses and regulation of gut microbiota and the short chain fatty acids (SCFAs) in ovariectomized (OVX) mice.

Methods: We predicted the mode of ZGS II action on OP through network pharmacology and molecular docking, and an OVX mouse model was employed to validate its anti-OP efficacy. Then we analyzed its impact on bone micro-structure, the levels of inflammatory cytokines and pain mediators in the serum, inflammation in colon, intestinal barrier, gut microbiota structure and SCFAs in feces.

Results: Network pharmacology identified 55 intersecting targets of ZGS II related to OP. Of these, we predicted IGF1 may be the core target, which was successfully docked with ZGS II and showed excellent binding ability. Our in vivo results showed that ZGS II alleviated bone loss in OVX mice, attenuated systemic inflammation, enhanced intestinal barrier, reduced the pain threshold, modulated the abundance of gut microbiota involving norank_f_Muribaculaceae and Dubosiella, and increased the content of acetic acid and propanoic acid in SCFAs.

Conclusion: ZGS II attenuated bone loss in OVX mice by relieving inflammation and regulating gut microbiota and SCFAs.

Acknowledgement: This work was supported by grants from the Science and Technology Planning Project of Yunfu, Guangdong Province, China [No. 2020A090402].

P1090
DECODING THE MECHANISM OF ELEUTHEROSIDE E IN TREATING OSTEOPOROSIS VIA NETWORK PHARMACOLOGICAL ANALYSIS AND MOLECULAR DOCKING OF OSTEOCLAST-RELATED GENES AND GUT MICROBIOTA

T. Zhou[1], Y. Zhou[1], L. Hu[1], Q. Dong[2], P. Sun[1]

[1]The First Affiliated Hospital of Guangdong Pharmaceutical Univ., Guangzhou, [2]Yunfu Hospital of Traditional Chinese Medicine, Yunfu, China

Objective: Eleutheroside E (EE) is an anti-inflammatory natural compound derived from the edible medicinal herb Acanthopanax senticosus. This study aims to investigate the underlying mechanism of the anti-osteoporosis action of EE through network pharmacology, molecular docking and gut microbiota.

Methods: Network pharmacology was used to explore the potential core targets and main pathways mediated by EE in osteoporosis (OP) treatment. Molecular docking was exploited to investigate the interactions between the active anti-OP compounds in EE and the potential downstream targets. Following the multi-approach bioinformatics analysis, ovariectomy (OVX) model was also established to investigate the in vivo anti-OP effects of EE.

Results: The top 10 core targets in PPI network were TP53, AKT1, JUN, CTNNB1, STAT3, HIF1A, EP300, CREB1, IL1B and ESR1. Molecular docking results that the binding energy of target proteins and the active compounds was approximately between -5.0 and -7.0 kcal/mol, which EE has the lowest docking binding energy with HIF1A. Enrichment analysis of GO and KEGG pathways of target proteins indicated that EE treatment could potentially alter numerous biological processes and cellular pathways. In vivo experiments demonstrated the protective effect of EE treatment against accelerated bone loss, where reduced serum levels of TRAP, CTX, TNFα, LPS, and IL-6 and increased serum levels of P1NP were observed in EE-treated mice. In addition, changes in gut microbiota were spotted by 16S rRNA gene sequencing, showing that EE treatment increased the relative abundance of Lactobacillus and decreased the relative abundance of Clostridiaceae.

Conclusion: These findings suggested that the characteristics of multi-target and multi-pathway of EE against OP. In vivo, EE prevents the onset of OP by regulating gut microbiota and inflammatory response and is therefore a potential OP drug.

Acknowledgment: This work was supported by grants from the Science and Technology Planning Project of Yunfu, Guangdong Province, China [No. 2020A090402].

P1091
GUT MICROBIOTA AND SHORT-CHAIN FATTY ACID SIGNATURES IN POSTMENOPAUSAL OSTEOPOROSIS PATIENTS: A RETROSPECTIVE STUDY

S. Li[1], Y. Zhang[1], C. Ma[1], Q. Dong[2], P. Sun[1]

[1]The First Affiliated Hospital of Guangdong Pharmaceutical Univ., Guangzhou, [2]Yunfu Hospital of Traditional Chinese Medicine, Yunfu, China

Objective: Studies have shown that gut microbiota (GM) and its metabolites, short-chain fatty acids (SCFAs), are associated with the development of postmenopausal osteoporosis (PMO). This study

explored the clinical and laboratory evidence of the relationship of GM and SCFAs to PMO and attempted to determine the potential mechanism of action.
Methods: 18 patients (Collected from the First Affiliated Hospital of Guangdong Pharmaceutical University between January 2021 and August 2021) were included in this retrospective study, including 10 PMO women and 8 healthy young women as the healthy control (HC) group from Guangzhou, China. BMD was determined by DXA. The composition of GM and its metabolites, SCFAs, in the fecal samples were measured by 16S rRNA gene sequencing and gas chromatography/mass spectrometry (GC/MS) analysis, respectively.
Results: Compared with HC, PMO group had significantly decreased BMD in lumbar spines 1–4 (BMD_L) and femoral neck (BMD_F). 16S rRNA gene sequencing revealed that, compared with HC, PMO group had a markedly decreased abundance in Subdoligranulum, Norank_f_Muribaculaceae and Alistipes at the genus level. GC/MS analysis indicated that the concentration of propanoic acid significantly dropped in PMO group. Additionally, we found that Subdoligranulum, Norank_f_Muribaculaceae and Alistipes were positively correlated with BMD_L. Subdoligranulum and Norank_f_Muribaculaceae were also positively correlated BMD_F and propanoic acid, while Subdoligranulum is the only species that presented a strong correlation with the levels of acetic acid and butyric acid.
Conclusion: In postmenopausal women, there were evident changes in GM and SCFAs, and these changes were found correlated with patients' BMD. These correlations provide novel insights into the underlying mechanism of PMO development, representative of early diagnostic markers and therapeutic targets that may improve the bone health in postmenopausal women.

P1092
INVESTIGATING THE PROTECTIVE EFFECT OF LOGANIN IN OVARIECTOMIZED-INDUCED BONE LOSS THROUGH NETWORK PHARMACOLOGY AND MOLECULAR DOCKING

Y. Xie[1], D. Ge[1], Q. Dong[2], P. Sun[1]

[1]The First Affiliated Hospital of Guangdong Pharmaceutical Univ., Guangzhou, [2]Yunfu Hospital of Traditional Chinese Medicine, Yunfu, China

Objective: Loganin, a major iridoid glycoside derived from Cornus officinalis (CO), exerts strong anti-inflammation property. This study aims to investigate the underlying mechanism of Loganin to reduce estrogen deficiency-induced bone loss through a combination of network pharmacology, molecular docking and in vivo validation.
Methods: We first predicted the drug targets and structural interactions of Loganin with osteoclasts on postmenopausal osteoporosis (PMOP) through network pharmacology and molecular docking. An ovariectomized (OVX) mouse model was established to experimentally validate Loganin's anti-PMOP efficacy, supported by its protective effect on bone destruction and excessive inflammatory cytokines.
Results: The top 10 core targets of Loganin generated by PPI network were GAPDH, VEGFA, EGFR, ESR1, HRAS, SRC, FGF2, HSP90AA1, PTGS2 and IL-2. GO and KEGG enrichment analyses indicated that Loganin suppressed PMOP via mediating inflammation, bone formation, IL-17 signaling pathway, and NF-κB signaling pathway. Molecular docking results indicated strong binding between Loganin and core targets, in which the binding energy was approximately between -5.2 and -7.4 kcal/mol. In vivo mouse model showed that Loganin inhibited the expression of pro-osteoclastic markers, such as TRAP, CTX, TNFα and IL-6, enhanced the secretion of bone formation markers, e.g., P1NP and IL-10, and improved bone microstructure (BV/TV and Tb.N), representative of the anti-resorptive effect mediated by Loganin.
Conclusion: This study combined network pharmacology and molecular docking to predict the underlying mechanism of Loganin against PMOP, validated by the in vivo mouse model showing that Loganin attenuated OVX-induced bone loss by inhibiting inflammation.
Acknowledgment: This work was supported by grants from the Science and Technology Planning Project of Yunfu, Guangdong Province, China [No. 2020A090402].

P1093
IMPROVED GRADUATION RESULTS BY TRAINING NURSE SPECIALISTS, NURSE PRACTITIONERS AND PHYSICIAN ASSISTANTS NATIONALLY UNDER THE AUSPICES OF THEIR NATIONWIDE PROFESSIONAL GROUP

P. van den Berg[1], M. van Oostwaard[2], H. van der Heijden[3], M. van Echtelt[4], D. Bout[5], E. Appelman[6], I. Draaijer[7]

[1]Reinier de Graaf Gasthuis—Dept. of Orthopedics and Traumatology—VF&O, Delft, [2]VieCuri Medisch Centrum—Dept. of Internal Medicine, Venlo, [3]Bernhoven Ziekenhuis—Dept. of Internal Medicine—VF&O, Uden, [4]St. Antonius Ziekenhuis—Dept. of Surgery—VF&O, Utrecht, [5]Isala Ziekenhuis—Dept. of Surgery—VF&O, Zwolle, [6]Haga Medisch Centrum—Dept. of Rheumatology—VF&O, Den Haag, [7]Ommelander Ziekenhuis—Dept. of Rheumatology—VF&O, Groningen—Scheemda, Netherlands

Objective: An initiative aimed at facilitating a uniform national course for Fracture Liaison Service (FLS) health care professionals in the Netherlands, based on traditional education and discussions between experts and students.
Methods: Since 2012, Dutch FLS care nurse specialists (NS), nurse practitioners (NP), and physician assistants (PA) received their FLS education from an applied science institution. However, this arrangement did not result in a well-attended and continuous program. Therefore, in 2020, the (unpaid) board of the Dutch Nurse Professionals Association on Secondary Fracture Prevention VF&O (member of Dutch National Nursing Association V&VN) initiated a comprehensive 4-day course (two blocks of two days). This course covers all aspects of secondary fracture prevention, including medical, nursing, organizational, and quality aspects [1]. It is a self-funded initiative, with a maximum capacity to accommodate 20 students annually. The teaching materials were based on Dutch guidelines on Fractures and Falls and rephrased up to the latest version in 2022 [2]. Seventeen experts were involved in the program, which averaged 30 h per course.
Results: Although the former education program and detailed information could be found on the education institute's website, the registration by students was low, no more than 45 graduated from 2012–2020. Since its inception by VF&O in 2020, VF&O board's recruitment process involved advertising in newsletters and on VF&O and V&VN websites. From 2020 a total of 75 healthcare professionals including 52 NSs, 16 NPs, 6 PAs and 1 physician graduated supporting their careers at FLS care facilities throughout the Netherlands.
Conclusion: A high attendance and appreciation of a nationwide uniform course contributes to (inter)national goals to optimize FLS care. All these graduated trainees are currently active in secondary fracture prevention underlining the empowerment and position of this subspecialty among nurse specialists, nurse practitioners and physician assistants.
Acknowledgements: We are especially grateful to all involved medical and nursing teachers and lecturers to free up time to reach optimal course content. We are grateful to Dave Schweitzer, MD

PhD, for his textual and substantive advices and the secretarial support by V&VN.

References:

1. https://www.venvn.nl/afdelingen/vallen-fracturen-osteoporose/cursus-osteoporose-en-fractuurpreventie-2023/ (Dutch, 29–12-2023).
2. https://richtlijnendatabase.nl/richtlijn/osteoporose_en_fractuurpreventie/startpagina_-_osteoporose_en_fractuurpreventie.html (Dutch, 29–12-2023).

P1094
LOW-INTENSITY PULSED ULTRASOUND PROTECTS CARTILAGE IN EXPERIMENTAL RABBIT KNEE OSTEOARTHRITIS

R. A. Ungur[1], I. M. Borda[1]

[1]Univ. of Medicine and Pharmacy Iuliu Hatieganu Cluj-Napoca, Cluj-Napoca, Romania

Objective: Many studies have shown a beneficial effects of ultrasound (US) therapy on chondrocytes apoptosis and extracellular matrix injuries in experimental osteoarthritis (OA). These effects depend on frequency, intensity and continuous or pulsed mode of US correlated with OA severity. The purpose of our study was to compare the effect of two dose of US therapy on knee articular cartilage of rabbits with knee experimental osteoarthritis (KOA).
Methods: Experimental OA was induced in 24 mature female rabbits by anterior cruciate ligament transection (ACLT). Ten weeks after ACLT, rabbits were randomized in into 4 groups: 2 control group and 2 treated groups. The treated groups (US 0.5 C and US 0.5 I) were exposed to US at a frequency of 1 MHz, 0.5 W/cm^2 intensity, in continuous (US 0.5 C), respective pulsate mode (US 0.5 I), for 5 min/d, 10 d. First control group (C1) was sacrificed immediately after the end of the period utilized for OA inducing. The second control group (C2) was exposed to sham US therapy and was sacrificed together with the treated groups, after the treatment ending. The cartilage samples were obtained from OA joints of the sacrificed rabbits and were evaluated by optical microscopy and transmission electron microscopy.
Results: In the treatment groups, we found that US therapy improved the chondrocyte viability, maintained cellular matrix structure and integrity to variable degrees. The US at 0.5 W/cm^2 intensity, in pulsate mode was more efficient in alleviating cartilage damages.
Conclusion: US can be considered a reliable option for treatment of OA patients and can act as disease modifying therapy.

P1095
DXA AND HR-PQCT EVALUATION OF BONE CHANGES IN COMPLEX REGIONAL PAIN SYNDROME

R. Abdala[1], I. Torrecilla[1], F. Jerkovich[1], F. Lustig Witis[1], M. S. Gonzalez Pernas[1], M. B. Zanchetta[1]

[1]IDIM (Instituto de Diagnóstico e Investigaciones Metabólicas), Ciudad Autónoma de Buenos Aires, Argentina

Objective: Complex regional pain syndrome (CRPS) is a neuropathic pain condition characterized by pain, sweating and trophic changes, typically manifesting as a localized limb disorder. The impact of CRPS on bone microarchitecture (BM) is not well understood. In a prior study, our group identified normal BMD differences in the hands and feet, utilizing specific regions of interest (ROIs) without noting variations in the feet BMD of healthy subjects. This study aims to elucidate changes in both BM and BMD among individuals affected by CRPS.
Methods: We recruited patients with CRPS referred to our institution for evaluation. HR-pQCT and DXA were employed to assess BM and BMD in the affected limb and its contralateral counterpart. Of the 28 enrolled patients, 15 underwent DXA, and 13 underwent HR-pQCT.
Results: DXA: All patients (n = 15) exhibited significant differences in BMD between the affected and unaffected limbs in both ROIs evaluated (-8.4% in ROIs1 and -8.9% in ROIs2). Median BMD values were 0.495 vs. 0.558 g/cm^2 in ROIs 1 ($p = 0.001$) and 0.837 vs. 1.000 g/cm^2 in ROIs2 ($p = 0.002$). HR-pQCT: Limbs affected by CRPS displayed a significantly total density (-10%), primarily attributable to the cortical component (-8.6%), in comparison with the healthy contralateral limb ($p \leq 0.05$). Although lower trabecular bone volume (-5.8%), decreased trabecular number (-7.38%), and reduced cortical thickness (-13.7%) were observed in affected limbs, these differences did not reach statistical significance.
Conclusion: We identified a significant decrease in BMD of the affected limb assessed by DXA. Additionally, a significant loss of total volumetric density, with a greater impact on the cortical component compared to the contralateral healthy limb, was observed through HR-pQCT. These findings present an alternative option for evaluating and monitoring treatment responses in patients affected by CRPS.

P1096
INFLUENCE OF WEIGHT ON URINARY AND PLASMA METABOLITES IN PATIENTS WITH KIDNEY STONES

R. Abdala[1], J. Quinchuela[2], R. Spivacow[1], M. B. Zanchetta[1]

[1]IDIM (Instituto de Diagnóstico e Investigaciones Metabólicas), Ciudad Autónoma de Buenos Aires, Argentina, [2]Fresenios Medical Care, Quito, Ecuador

Objective: Nephrolithiasis (NL) is a multisystem disease in which intrinsic factors and extrinsic factors are related. Body weight is inversely related to urinary pH, and obesity is often accompanied by conditions such as insulin resistance and metabolic syndrome that can affect the balance between kidney stone-inhibiting and promoting substances. The objective of our study was to assess the impact of body weight on the different metabolic disorders found in patients with confirmed kidney stones.
Methods: A retrospective and analytical study was carried out. A total of 1311 participants over 18 y of age with confirmed NL who consulted our institution for their metabolic study were included. Metabolite and PH were obtained in urine: UA, Ca, P, Mg, Ox, Na, K and Citrate. In blood: Ca, PTH, Vit D, Cr, AU, Urea. For the analysis, the sample was divided into men (H) and women (W) and the data were analyzed between: Normal weight (NW), Overweight (OW) and obesity (OB) with the ANOVA test. Statistical significance was considered when $p < 0.05$.
Results: 616 H and 695 M were considered for the analysis. The mean age was 49.72 ± 13.53 in M and 49.06 ± 14.17 in W. 15% of the W had a BMI > 29.9 (OB). W with OB had higher serum levels of UA mg/dL compared to OW and NW (5.1 vs. 4.5 vs. 4.1; $p < 0.001$ and lower levels in VD ng/ml (27.2 vs. 30 vs. 31.6; $p = 0.03$). In urine: W with OB presented higher levels of Cr, P, UA, Na, all these differences with a $p < 0.0001$; in addition to observing a more acidic PH $p < 0.05$. M with OB (23%) compared to OW and NW, had higher levels of AU mg/dL (6.3 vs. 5.9, vs. 5.4; $p < 0.0001$) and lower VD ng/ml (22.9 vs. 26.6, vs. 26.7; $p < 0.05$). In urine: H with OB had higher values of Cr, Ca, P, AU, Na ($p < 0.0001$) and Ox ($p < 0.05$). Furthermore, they presented more acidic urine $p < 0.0001$. The prevalence of multiple metabolic disorders (2 or more disorders) was higher among OB vs. NON-OB 76% vs. 57%; $p < 0.05$.

Conclusion: These data show the impact of obesity on the different metabolites that condition an environment suitable for the development of kidney stones. Importantly, we observed multiple metabolic disorders in this population, with increased excretion of kidney stone promoters.

P1097
IMPACT OF VITAMIN D (VD) ON CANCER

R. Amir[1]

[1]Research Group, Jeumont, France

Objective: VD is well known for its role in regulating mineral homeostasis. It has been clearly shown that VD helps the immune, muscle, and nervous system function properly. Recent epigenomic, transcriptomic, and proteomic studies have revealed novel VD-mediated biological mechanisms that regulate cancer cell self-renewal, differentiation, proliferation, transformation, and death.
Methods: Tumor micro-environmental studies have also revealed dynamic relationship between the immune system and VD's anti-neoplastic properties. In experimental studies of cancer cells and of tumors in rodents, VD has been found to have several biological activities that might slow or prevent the development of cancer, including promoting cellular differentiation, decreasing cancer cell growth, stimulating cell death (apoptosis), reducing tumor blood vessel formation (angiogenesis), and decreasing tumor progression and metastasis. VD was also found to suppress a type of immune cell that normally prevents the immune system from responding strongly to cancer. VD deficiency and racial disparities are associated with a deluge of diseases, including cancer, resulting in an escalating burden on the healthcare system. The 1,25(OH)2D effects are mediated by the VD receptor, a member of the intracellular nuclear receptor superfamily that can induce cell cycle arrest and death through post-transcriptional, post-translational and gene regulatory mechanism.
Results: The recent vital supplementation trial demonstrated that VD levels above those required for the maintenance of bone health can increase cancer patients survival, particularly in well documented regions. Novel anticancer drugs and therapeutic strategies that target the metabolic and signalling networks of VD and its metabolites are currently being researched. VD is a well known immune system process regulator that targets genes, regulatory transcription factors, and epigenetic modulators to promote anti-inflammatory responses in a variety of immune-related diseases, including cancer.
Conclusion: Given that VD sensitizes cancer immunotherapy, it may interact with these putative effector systems to sensitize tumor cell death, establishing a new paradigm in VD research and addressing racial disparities linked to VD deficiency and increased cancer incidence.

P1098
ADDUCTOR CANAL BLOCK AFTER TOTAL KNEE ARTHROPLASTY HAS COMPARABLE POSTOPERATIVE PAIN CONTROL AND QUADRICEPS MUSCLE SPARING AS ASSESSED BY SURFACE ELECTROMYOGRAPHY: A RADOMIZED CONTROL TRIAL

C. Tubtim[1], K. Sukhonthamarn[1], W. Witayakom[1], A. Wittayapairoj[2], S. Oraintara[3], K. Srungboonmee[4], R. Apinyankul[1]

[1]Dept. of Orthopaedics, Faculty of Medicine, Khon Kaen Univ., Khon Kaen, [2]Dept. of Anesthesiology, Faculty of Medicine, Khon Kaen Univ., Khon Kaen, [3]Faculty of Engineering, Mahidol Univ., Nakhon Pathom, [4]Center of Data Mining and Biomedical Informatics, Mahidol Univ., Nakhon Pathom, Thailand

Objective: To assess the impact of adductor canal block (ACB) on quadriceps muscle function after total knee arthroplasty (TKA) using surface electromyography (sEMG). The study compared outcomes, including pain control, morphine consumption, and walking capacity, between patients receiving ACB and those without ACB.
Methods: A randomized control trial comprising 25 TKA patients was conducted, with participants divided into two groups: ACB and non-ACB. Various parameters, including visual analog scale (VAS) scores, anteromedial knee sensation, morphine consumption, first-time pain control requirement, adverse events, and the median frequency of rectus femoris (RF) and vastus medialis (VM) muscles, were assessed on postoperative days (POD) 1–4. Additionally, a timed 10-m walk test was performed on POD4.

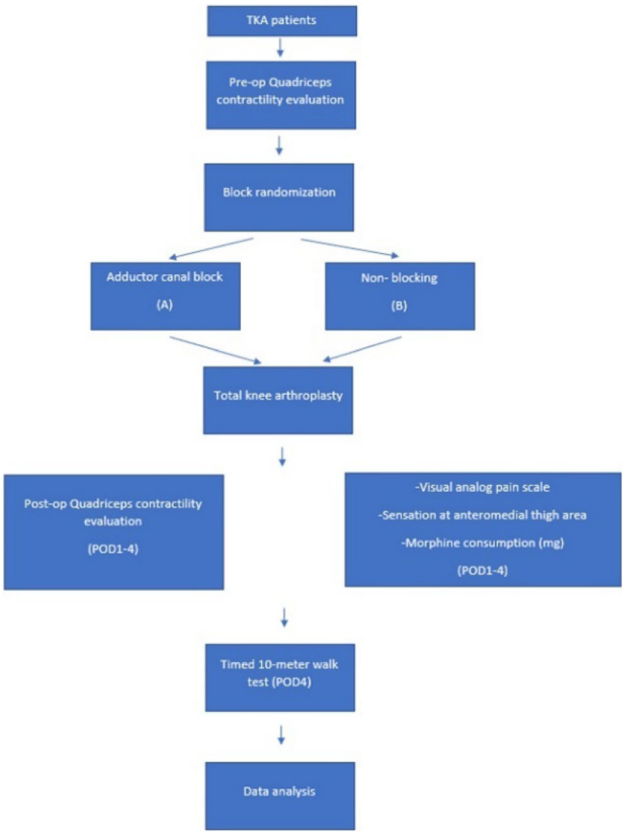


Table 1. Demographic data

	ACB (n = 12)	Non- ACB (n = 13)	p- value
Age (year) mean +/- SD	72.58 ± 4.22	67.30 ± 3.96	0.10
Height (cm) mean +/- SD	156.58 ± 5.55	153.69 ± 3.76	0.42
Weight (kg) mean +/- SD	69.73 ± 4.48	64.09 ± 4.79	0.24
BMI (kg/m2) mean +/- SD	28.44 ± 2.84	27.12 ± 1.76	0.46
Sex (female/ male)	6/6	13/0	0.002
Pre-op VAS mean +/- SD	7.5 ± 0.54	7.69 ± 0.45	0.61
Side (Left/ Right)	6/6	7/6	0.86

Results: No significant differences were observed between the two groups in terms of median frequency (MF) of RF and VM, VAS scores, morphine consumption, timed 10-m walk test results, and the occurrence of adverse events. The study findings suggest that ACB did not result in impaired postoperative Quadriceps muscle strength, as evidenced by surface EMG data. Moreover, pain relief and walking capacity were comparable between the ACB and non-ACB groups.

Figure 1: Median frequency of Rectus femoris muscle

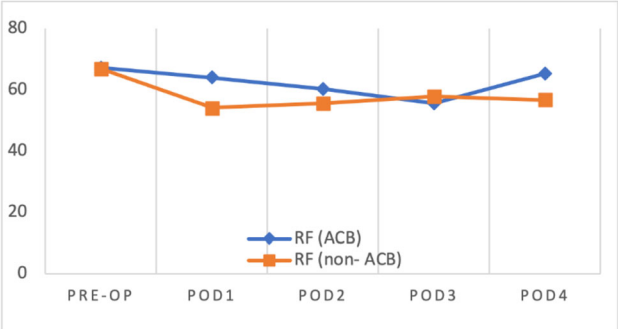


Figure 2: Median frequency of Vastus medialis muscle

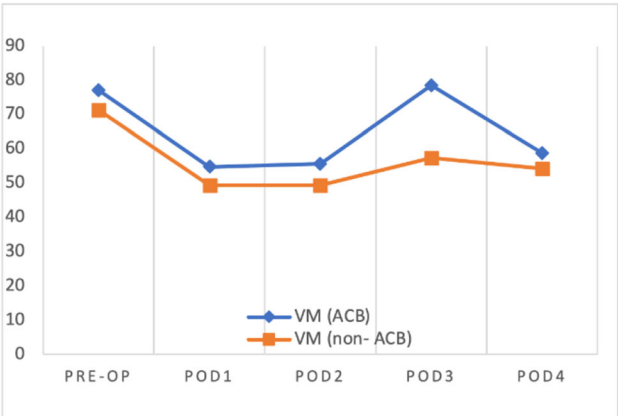
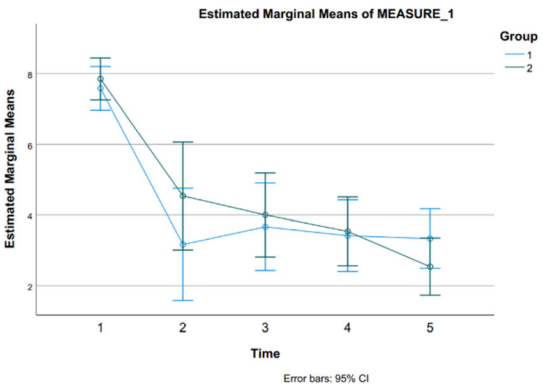


Figure 3: Postoperative VAS (Group1: ACB, Group2: Non-ACB)



Conclusion: Based on the outcomes of this study, the administration of ACB in TKA patients did not lead to Quadriceps muscle strength impairment, as assessed by surface EMG. These findings support the safety and efficacy of ACB in providing postoperative pain relief without compromising early ambulation and functional recovery in TKA patients.

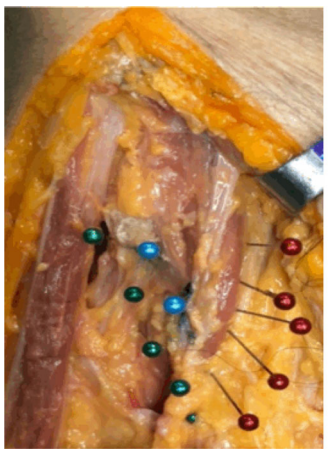
P1099

AN ANATOMIC CONSIDERATION OF THE FEMORAL NERVE DURING ANTERIOR HIP APPROACH: A CADAVERIC STUDY

W. Witayakom[1], K. Sukhonthamarn[1], W. Kosuwon[1], R. Apinyankul[1]

[1]Dept. of Orthopaedics, Faculty of Medicine, Khon Kaen Univ., Khon Kaen, Thailand

Objective: To investigate the distance and correlation between the anatomy of the anterior side of the hip joint and the femoral nerve.
Methods: Using 10 fresh-frozen cadavers, and 20 hip joints. We dissected and marked the femoral nerve in the inguinal area. Employing the direct anterior approach, we identified and marked study points, including the superior and inferior points of the anterior rim of the acetabulum, ¼ point, half point, and ¾ point along an imagined line connecting the superior and inferior point, the infero-medial and mid aspect of the femoral neck, and the soft spot. Coronal plane measurements gauged the distance between these points and the femoral nerve. The collected data were analyzed to assess distance and correlation.
Results: There was no distance between the inferior point of the anterior rim of the acetabulum and the mid aspect of the medial side of the femoral neck in the coronal plane, relative to the femoral nerve (median = 0; IQR 0–0). The mean distance between the soft spot and the femoral nerve was also 1.18 ± 0.63 cm.



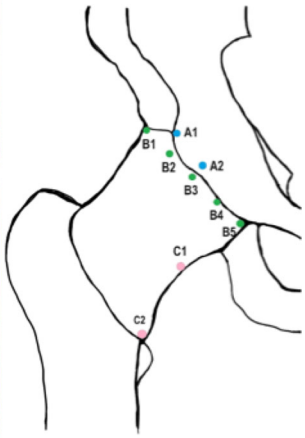


Table 1: The closest distance from the anterior aspect of the acetabular rim, neck of the femur to femoral nerve branches

Reference points	Mean ± SD or Median (IQR) (centimeter)
Superior point of the anterior acetabulum	3.02 ± 0.59
¼ point from the superior acetabulum	2.37 ± 0.63
Half point from the superior acetabulum	1.82 ± 0.53
¾ point from the superior acetabulum	0.99 ± 0.36
Inferior point of the anterior acetabulum	0 (0 – 0)
Mid aspect of the medial side neck of the femur	0 (0 - 0)
Inferomedial aspect of the medial neck of the femur	0.05 ± 0.22

SD, standard deviation; *IQR*, interquartile range

Table 2: Distance between the soft spot to the acetabulum and femoral nerve

The soft spot to femoral nerve/reference points	Mean +/- SD (centimeter)
Soft spot to femoral nerve	1.18 ± 0.63
Superior point of the soft spot to the superior point of the acetabulum	1.66 ± 0.58
Inferior point of the soft spot to the superior point of the acetabulum	2.4 ± 0.67

SD, standard deviation

Conclusion: The inferior point of the acetabulum's anterior rim and the femoral neck's mid aspect are critical caution points when approaching the hip joint via the direct anterior approach. Surgeons should insert the retractor as lateral as possible at the anterior rim of the acetabulum. The soft spot at the anterior rim of the acetabulum remains safe from direct injury when surgeons use the correct technique during insertion.

P1100
MANAGEMENT OF ACETABULAR OSTEOLYSIS WITH A RETAINED SHELL AND INJECTION OF DEMINERALIZED BONE MATRIX USING A VINYL URINARY CATHETER AND SYRINGE: A NEW TECHNIQUE AND CASE SERIES

R. Apinyankul[1], L. Silva[2], S. Goodman[3]

[1]Dept. of Orthopaedics, Faculty of Medicine, Khon Kaen Univ., Khon Kaen, Thailand, [2]Dept. of Nursing, Stanford Health Care, Stanford, CA, USA, [3]Dept. of Orthopaedic Surgery Stanford Univ. Medical Center Outpatient Center Stanford Univ. School of Medicine, Stanford, CA, USA

Objective: Management of retro-acetabular osteolysis in revision hip arthroplasty with acetabular component retention remains controversial and challenging due to limited accessibility to the area.
Methods: 14 patients with well-fixed and well-aligned acetabular components underwent revision surgery and a retained shell. A vinyl urinary catheter and syringe were used to deliver demineralized bone matrix putty to the bone defect after debridement. Clinical outcome and radiographic follow-up were scheduled at a minimum of 2 y.
Results: Significant improvement of UCLA, HHS pain, and HOOS JR scores were observed at a median 6-y follow-up. One cup failed due to an aseptic loosening cup and another from late septic loosening.

Table 1: Demographic characteristics

Variables	n (%)	Mean (SD)	Median [IQR]
Gender			
Male: Female	9 (64.3):5 (35.7)		
Side			
Right: Left	5 (35.7):9 (64.3)		
Age at surgery (year)		64.4 (14.4)	
BMI (kg/m^2)		27.4 (8.1)	
ASA class			
1-2	4 (28.6)		
3	10 (71.4)		
Charlson comorbidity index (CCI)			2 [2,4]
Other reasons for revision THA			
Dislocation/in stability	1		
Loosening femoral stem/peri-stem osteolysis	6		
Massive liner wear	5		
Surgical approach			
Anterolateral	2 (14.3)		
Posterolateral	9 (64.3)		
Extended trochanteric osteotomy (ETO)	3 (21.4)		
Revised component(s)			
Liner only	1 (7.1)		
Liner and head	4 (28.6)		
Liner, head, and stem	9 (64.3)		
Preop liner types			
Conventional polyethylene	11 (78.6)		
Highly crosslink polyethylene (HLXPE)	3 (21.4)		
New liner types			
Neutral HLXPE	5 (35.7)		
Elevated HLXPE	7 (50)		
Lateralized-elevated HLXPE	2 (14.3)		
Acetabular component alignment			
Cup inclination		44.5 (6.6)	
Cup anteversion		26.6 (9.2)	
Volume of demineralized bone matrix putty (cc.)			10 [10,20]
Operative time (minutes)			139 [119,231]
Intraoperative blood loss (milliliters)			300 [200,475]
Length of hospital stay			3 [3,4]
Follow up time (months)			71.5 [30.5,121.8]

SD: Standard deviation
IQR: Interquartile range

Table 2: Implant characteristics and alignment of cup

Patient	Sex	Age	Side	Cup model	Preop head size	Postop head size	Cup size	Cup inclination	Cup anteversion	Failed Component
1	Male	50	R	HGP2	28	32	(HH)	38	22	No failure
2	Male	83	L	Duraloc	32	36	60	50	20	No failure
3	Male	74	R	Howmedica/osteonic	32	32	58	48	13	No failure
4	Female	56	L	APR Zimmer	28	28	49	36	29	No failure
5	Female	83	L	Duraloc Bantum locking ring	28	36	56	46	37	No failure
6	Female	57	L	Pinnacle ALTRX	36	36	56	42	29	No failure
7	Male	58	L	HGP2	32	32	58	37	39	No failure
8	Female	58	R	P7 Stryker	28	32	66	55	12	No failure
9	Male	79	R	Biomet (Hex lock)	28	36	56	53	31	Aseptic loosening of shell
10	Female	75	L	Pinnacle ALTRX	32	32	52	44	39	No failure
11	Male	69	L	Zimmer Converge Cup	38	38	57	38	21	No failure
12	Male	70	L	Zimmer Trilogy	36	36	64	41	17	No failure
13	Male	32	R	Marathon	28	28	48	54	33	Septic loosening of both components
14	Male	57	L	Osteonics SecurFit	28	32	60	41	31	No failure

Table 3: Patient reported outcomes

Outcomes	Preop mean	Postop mean	Mean difference (95%CI)	p value
UCLA	3.3	5.5	1.5 (0.6,2.4)	**0.014**
VR-12 physical	26.0	39.3	13.3 (-8.0,34.5)	0.141
VR-12 mental	46.3	57.0	13.8 (-1.4,28.9)	0.063
HHS pain	12.5	39.7	26.0 (14.7,37.3)	**0.005**
HHS function	24.3	37.3	13.8 (-4.0,31.5)	0.091
HOOS JR	47.0	82.9	34.8 (11.2,58.4)	**0.018**

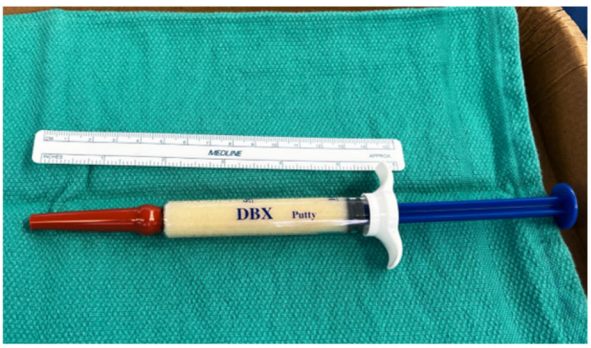


Figure 2: Demineralized bone matrix putty in 10 cc. syringe (DBX® Putty) integrated with 2 inches sterile vinyl urethral catheter.

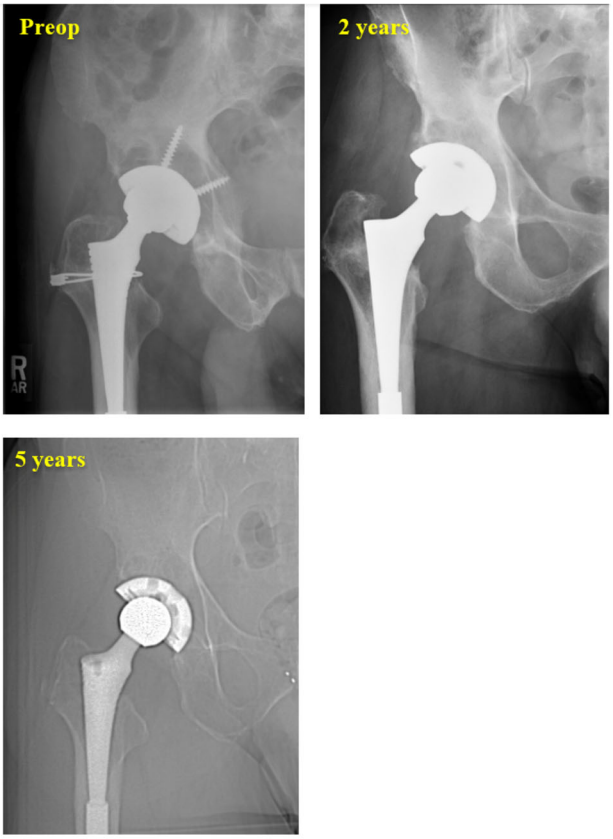


Figure 3: 74 years old man with liner and head exchange. All screws were removed for stability tests and screw hole exposure. Cup and stem were retained with liner and head

Conclusion: Management of retro-acetabular osteolysis with injected demineralized bone matrix using a syringe and vinyl urinary catheter is a reliable, easy, low-cost method with satisfactory mid-term clinical outcome improvement.

P1101
NEUROPEPTIDES, NOX4 AND S100A4: NEW IMPLICATIONS FOR THE PATHOGENESIS OF AGE-RELATED PAINFUL OSTEO-ARTICULAR DISORDERS

R. Bonanni[1], I. Cariati[2], B. Gasperini[1], A. Falvino[1], S. Gino Grillo[3], L. Tranquillo[3], R. Iundusi[3], E. Gasbarra[3], V. Tancredi[2], U. Tarantino[4]

[1]Dept. of Biomedicine and Prevention, Univ. of Rome Tor Vergata, [2]Dept. of System Medicine, Univ. of Rome Tor Vergata, [3]Dept. of Orthopedics and Traumatology, Policlinico Tor Vergata Foundation, [4]Dept. of Clinical Science and Translational Medicine, Univ. of Rome Tor Vergata, Roma, Italy

Objective: To identify a correlation between the expression of neuropeptides involved in the development and maintenance of pain, such as nerve growth factor (NGF), calcitonin gene-related peptide (CGRP), substance P (SP) and intestinal vasoactive peptide (VIP) [1], as well as the expression of NOX4 and S100A4, involved in the development and maintenance of neuropathic pain [2], with self-reported pain levels of patients with osteoporosis and osteoarthritis, in order to identify potential new markers for the management and treatment of age-related painful osteo-articular diseases.
Methods: 30 patients undergoing hip arthroplasty for osteoarthritis (OA) or fragility fracture (OP) were enrolled, and bone biopsies were collected for histological, immunohistochemistry, and western blotting analyses.
Results: The two groups showed significant differences in T-Score values and VAS score. OA patients were all characterized by chronic pain, whereas the pain of OP patients dated back to the fracture event. The bone tissue of OA patients showed better morphometric parameters and higher expression of NGF and neuropeptides than the OP group. Important, the NOX4/S100A4 ratio was significantly higher in the bone of OA patients, while abundant S100A4 expression and poor NOX4 levels were found in the bone tissue of OP patients.
Conclusion: Neuropeptide expression correlates with patients' self-reported pain levels. Of note, the increased expression of NGF in the bone tissue of OA patients could be responsible for the chronic pain of these patients. The elevated expression of NOX4 and altered NOX4/S100A4 ratio suggests the presence of a neuropathic component of pain in this cohort of OA patients. Suppression of NGF and NOX4 activity could be a potential target for the management of osteoarthritis and associated chronic pain.
References:

1. Bonanni R, et al. J Clin Med 2022;11:2609
2. Wack G, et al. Free Radic Biol Med 2021;168:155

P1102
TOMOGRAPHIC ANALYSIS OF METACARPALS IN MARTIAL ARTS (MUAY THAI) PRACTITIONERS AS UNPRECEDENTED EVIDENCE OF EXERCISE EFFECTS ON BONE DESIGN, INDEPENDENT OF CORTICAL TISSUE STIFFNESS

J. Bazán[1], G. Cointry[2], S. Lüscher[2], J. Ferretti[2], L. Intelangelo[1], R. Capozza[2]

[1]Unidad de Investigación Musculoesquelética, Centro Universitario de Asistencia, Docencia e Investigación – CUADI, Universidad del Gran Rosario, [2]Centro de Estudios de Metabolismo Fosfocálcico, Rosario, Argentina

Objective: This study provides original evidence for the hypothesis that physical activity improves the design over the rigidity of cortical bone tissue in human long bones, primarily mediated by the bone mechanostat. It specifically aimed to evaluate tomographic indicators from pQCT assessing mass, stiffness, and cortical tissue distribution efficiency in the 2nd and 3rd metacarpals (with fixed positions in the hand) and the 4th and 5th metacarpals (more freely pivoting over the carpus) in 15 male Muay Thai (MT) practitioners compared to 15 untrained males (Ctrl), matched for age, weight, and height.
Methods: For individuals in both groups, ten pQCT scans were performed on metacarpals 2 to 5, measuring volumetric cortical density (vCtD, indicative of tissue stiffness), cortical bone area (CtA), cortical bone content (CtC), and moments of inertia for antero-posterior (xMI) and lateral (yMI) flexion. ANOVA was used to evaluate

differences in these parameters between groups and slices, while ANCOVA assessed the correlations between bone distribution (MIs) and stiffness (vCtD).

Results: MT participants had significantly higher CtA and CtC in metacarpals 2–5 than Ctrl (ANOVA, $p < 0.05$). No significant differences were found in vCtD. MT showed higher MIs in centro-proximal cuts of metacarpals 4 and 5 ($p < 0.05$), but not in 2 and 3, contrasting with the uniformly increased mass (CtA, CtC). 'd/r' curves in proximal regions were similar for metacarpals 2 and 3, but higher in MT for metacarpals 4 and 5, indicating greater MIs for the same vCtD (ANCOVA, $p < 0.05$).

Conclusion: MT practitioners exhibited greater cortical area and mass across all metacarpals, likely due to formative stimulus from stress induced by practice. The consistency of vCtD suggests that material stiffness did not influence the results. Elevated MIs in MT, specifically in metacarpals 4 and 5, indicate enhanced resistance to A-P and lateral flexion at these sites. Differences in d/r curves for metacarpals 4 and 5 align with the biomechanics of punching, suggesting bone tissue distribution is tailored to specific stress demands. Metacarpals 2–3 show a different pattern, reflecting a mechanostat response more to compression, while metacarpals 4–5 adapt to flexural stress. This supports the hypothesis that martial arts practice fine-tunes the mechanostat's ability to adapt bone design to physical stress.

P1103
RELATIONSHIP BETWEEN PHYSIOLOGICAL CHARACTERISTICS AND CUMULATIVE INCIDENCE OF FALLS IN OVERWEIGHT OLDER WOMEN

R. Dadeliene[1], E.-I. Jamontaite[1], V. Gineviciene[1], A. Mastaviciute[1], E. Pranckeviciene[1], J. Kilaite[1], I. Ahmetov[1], V. Alekna[1]

[1]Vilnius Univ., Vilnius, Lithuania

Objective: Aging is characterized by a progressive loss of physiological integrity, leading to impaired function and increased vulnerability to death. Falls in older adults are one of the most common and serious problems. However, it is unclear which physiological factors coexist or are independent contribute to increased risk for falls in overweight older women. The aim of the study was to explore the relationship among vital lung capacity (VLC), hand grip strength (HGS), psychomotor abilities, and incidence of falls in overweight older women.

Methods: Community-dwelling older 33 women (mean age 75.79 (SD ± 6.77) y, 67% were widows and 61% of them living alone) without symptoms of sarcopenia and major disease were selected for this cross-sectional study. Socio-demographic characteristics, anthropometric measurements and data of incidence of falls during one-year period of the individuals were recorded. Participants completed a battery of tests to evaluate VLC (diagnostic spirometer Micro 1), simple and complex psychomotor reaction time (PRT), frequency of movement (device REKSAS PRO-RA-1) Handgrip hydraulic dynamometry (SAEHAN) was used as a valid, reliable measure of HGS.

Results: The average of BMI was 27.63 (SD ± 4.31) kg/m^2, indicated overweight. Was found that 21% of subjects had incidents of fall 2–4 times per year, 9%. subjects fell 5 or more times per year. VLC of the subjects was poor 2.50 ± 0.52 l. HGS of the right hand was 25.91 ± 5.63 kg, left hand—24.52 ± 6.31 kg. Simple PRT data was 355.66 ± 161.99 ml, complex PRT 530.86 ± 234.70 ml. Correlation analysis showed a significant negative relationship between simple PRT and VLC r = -0.42 ($p \leq 0{,}01$), HGS (right r = -0,388, $p \leq 0{,}05$, left r = -0,515, $p \leq 0{,}01$). Furthermore, there was determined significant correlation between the incidence of falls and single PRT r = -0,534, $p \leq 0{,}01$ and HGS (right r = -0,411, $p \leq 0{,}05$, left r = -0,377, $p \leq 0{,}05$).

Conclusion: It was determined that there is a significant relationship between vital lung capacity, psychomotor reaction time, grip strength and higher cumulative incidence of falls. The presence of this relationship may guide the planning of exercise therapy in overweight older women.

Acknowledgement: This project has received funding from the Research Council of Lithuania (LMTLT), agreement No S-MIP-22–36.

P1104
RISK OF IMPLANT FAILURE IN OPERATED UNSTABLE TROCHANTERIC FRACTURES IN PATIENTS WITH OSTEOPOROSIS

A. L. Dimitriu[1], R. Ene[1], C. Georgescu[1], E. G. Popescu[1], B. Bolos[1]

[1]Clinical Emergency Hospital / Dept. of Orthopedics, Bucharest, Romania

Objective: Fragility fractures of the trochanteric area are very common in the Emergency Departments. In these cases, because the fractures occur in the elderly population, a quick evaluation and surgical management is required, in order to quickly mobilize the patients and avoid thromboembolic complications [1]. However, some conditions need to be met, because a quite high number of these patients experience implant failure [2]. This seems to be in direct relationship to the anatomy of the fracture [3], the implant that was used [4], the surgical reduction of the fracture, the position of the lag screw in the femoral neck, the time of full weight bearing is allowed, and even, in a few numbers of cases, the tissue reaction to the implant [5].

Methods: Our study included 86 patients with unstable trochanteric fractures according to the Evans criteria, which were surgically managed between January 2022 and December 2022. In all cases intramedullary fixation was used, in 65 cases a short nail was used and in 21 cases a long nail was used, due to the diaphyseal extension of the fracture. We noted the reduction of the fracture, the position of the femoral neck screw and the time of full weight bearing.

Results: In 10 cases we experienced mechanical failure of the implant, 8 cases had cutting out of the lag screw and in two cases breakage of the nail was noticed. The surgical reduction of the fracture seems to be the most important factor that promotes healing ($p = 0.02$). Also, the correct positioning of the lag screw is also of great importance ($p = 0.05$) in order to avoid the cutting out complication. The moment of full weight bearing was not of statistical value ($p = 0.15$), maybe because in unstable fractures with loss of medial cortex we tend to be more careful and avoid full weight bearing for up to 6 weeks, and no differences between full weight bearing at 6 weeks or 8 weeks or more were found.

Conclusion: The loss of medial cortical support is of great importance in the management of trochanteric fractures, but a careful surgical reduction and correct position of the lag screw seems to be enough in order to achieve fracture healing in osteoporotic patients.

References:

1. Black DM, et al. N Engl J Med 2020;383:743
2. Mirea R, et al. Materials (Basel) 2021;14:2774
3. Wang PW, et al. Orthop Surg 2019;11:777
4. Tisler CE, et al. Polymers 2022;14:2969
5. Lupescu O, et al. Rom J Morphol Embryol 2016;57:1137

P1105
FUNCTIONAL OUTCOME AFTER NON-OPERATIVE TREATMENT OF FRAGILITY FRACTURES OF THE WRIST

C. Georgescu[1], A. L. Dimitriu[1], E. G. Popescu[1], B. Bolos[1], R. Ene[1]

[1]Clinical Emergency Hospital, Dept. of Orthopedics, Bucharest, Romania

Objective: Fragility fractures of the wrist are the most common injury in adults, notably the fracture of distal radius, accounting for approximately 17.5% of fractures [1]. No consensus has been reached to date regarding the optimal treatment for distal radius fractures, despite the fact that the rate of operative treatment has been increasing globally [2]. In many of these cases the patients are elderly, with multiple comorbidities, and it's important to carefully evaluate the individual cases and choose the right treatment for each of them, considering the expected functional outcome, risks associated [3] and possible complications of metallic implants [4] [5].
Methods: This study included 104 patients with distal radius fractures treated with closed reduction and immobilization with casts between January 2022 and December 2022. They were evaluated radiographically and clinically at 7, 14, 21 days and at 6, 12 and 24 weeks. Also at 3 and 6 months we evaluated the functional outcome using the PRWE (Patient-Rated Wrist Evaluation) score-, grip strength (measured in kg) and mobility of the wrist.
Results: 58 fractures were extraarticular (AO-A class), 19 simple intraarticular (AO-B class) and 27 complete intraarticular (AO-C class). Mean PRWE score was 18 at 3 months and 11 at 6 months. Grip strength and mobility, compared to other limb, weren't corelated with fracture class (according to AO) or age at 3 months, but slightly better mobility and grip strength was observed at 6 moths for type A and B fractures.
Conclusion: Overall, the functional outcome after non-operative treatment of wrist fractures is very good in elderly patients, with good mobility and grip strength compared to other limb at 6 months and low complication rates.
References:
1. Court-Brown CM, Caeser B. Injury 2006;37:691.
2. Song J, et al. Int J Clin Exp Med 2015;8:17,023.
3. Olivera L, et al. Rom J Morphol Embryol 2016;57:1137.
4. Radu M, et al. Materials 2021;11:2774.
5. Mirea R, et al. Metals 2021;11:857.

P1106
SIGNIFICANCE OF COMORBIDITY ON BONE MINERAL DENSITY IN MEN WITH HIP FRACTURE

R. F. Filipov[1], S. B. Bačević[2], D. S. Stojanović[3], I. J. V. Jovanović Vasović[1], K. M. Marković[4]

[1]Instute for Treatment and Rehabilitation Niška Banja, Niš, [2]General Hospital Prokuplje, Prokuplje, [3]Clinic for Neurology UKC Niš, Niš, [4]Instute of Rehabilitation Niška Banja, Niš, Serbia

Objective: Osteoporosis itself is a significant risk factor for fracture occurrence. Osteoporosis is characterized by a lack of pain or significant symptoms until fractures occur, earning it the nickname "silent bone thief." The aim of this study is to investigate the influence of comorbidities, visual impairment, reduced height, and hereditary predisposition on BMD in men with and without hip fractures.
Methods: The study included 100 male participants, divided into two groups: the study group (50 participants) with hip fractures and the control group (50 participants) without fractures. A detailed clinical examination was conducted for all participants. BMD was measured using a Hologic densitometer.
Results: In the hip fracture group, 34.0% had comorbidities, while the control group showed significantly fewer comorbidities (12.0%, $p = 0.007$). The most common comorbidity in both groups was high blood pressure (HOBP)—47.1% of fracture patients with comorbidities and half of the control group with comorbidities. Rheumatoid arthritis (RA) was present in 29.4% of fracture patients with comorbidities and half of the control group participants. Visual impairment was more prevalent in hip fracture patients, accounting for 28.0%, compared to 12.0% in the control group. Reduced height (> 3 cm) was observed in 54.0% of hip fracture patients and 14.0% of those without fractures, with a statistically significant difference between the groups ($p < 0.001$). Maternal hip fracture was documented in 44.0% of patients with fractures and 16.0% of the control group. A statistically significant difference in the frequency of maternal hip fractures was found between the groups ($p = 0.005$). The average values of all examined bone density parameters were significantly lower in participants with fractures compared to the control group ($p < 0.001$).
Conclusion: The presence of comorbidities represents a risk factor for reduced bone density in men.

P1107
DYNAMICS OF SUBJECTIVE CONTROL LEVEL IN SYSTEMIC SCLEROSIS PATIENTS AS A RESULT OF THE NEUROFEEDBACK TRAINING

R. Grekhov[1]

[1]Zborovsky' Research Institute for Clinical and Experimental Rheumatology, Volgograd State Medical Univ., Volgograd, Russia

Objective: To study the dynamics of the level of subjective control in patients with systemic sclerosis (SS) after the neurofeedback (NFB) training.
Methods: There were 90 patients with SS under observation, who were randomly divided into two groups: the main group ($n = 60$) and the control group ($n = 39$). The average age of the patients was 54.31 ± 12.8 y, and the average duration of the disease was 9.71 ± 7.9 y ($M \pm \sigma$). The patient groups were comparable in terms of gender, age, and duration of the disease. Patients with SS in the main and control groups received similar medical and physiotherapy treatment, but patients in the main group additionally received 14 procedures of neurofeedback (NFB) multimedia training. The technique was carried out using the psychophysiological rehabilitation complex "Reacor". Training was based on the parameters of the brain electrical activity (electroencephalogram relaxation), aimed at increasing the alpha-activity of the brain. The study of the level of subjective control was carried out using the LSC questionnaire (Bazhin EF et al., 1987).
Results: As a result of NFB training course, the indicators of the level of subjective control underwent significant changes on all scales of the questionnaire. The use of NFB contributed to an increase in the internality (increase in indicators) of SS patients on scales in the general sphere, the sphere of achievements and attitudes to health. In patients receiving traditional therapy, the dynamics of LSC was similar, but unreliable—LSC indicators also changed in the control group, but significant increase was recorded only on the scale of general internality and scale of interpersonal relations.
Conclusion: The impact of the NFB training is associated with the reorientation of the external locus of control to the internal one, which is considered as a component of personal maturity. With the help of NFB, patients acquire a sense of control over their disease, adhere to the treatment regimen more strictly, and take responsibility for taking care of their health. Perhaps it is the aspect that leads to more effective results of the therapeutic process when the patient's faith in

his ability to control the symptoms of the disease acts as more critical value than change in any physiological parameter.

P1108
DYNAMICS OF EMOTIONAL STATUS OF PATIENTS WITH SYSTEMIC SCLEROSIS UNDER THE INFLUENCE OF NEUROFEEDBACK TRAINING

R. Grekhov.[1]
[1]Zborovsky' Research Institute for Clinical and Experimental Rheumatology, Volgograd State Medical Univ., Volgograd, Russia.

Objective: To correct the emotional status of patients with systemic sclerosis (SS) using neurofeedback (NFB) training.

Methods: 99 patients with SS were selected randomly into 2 groups: the main group (n = 60) and the control group (n = 39) which were comparable in terms of gender, age, and duration of the disease. The average age of the patients was 54.31 ± 12.8 y, and the average duration of the disease was 9.71 ± 7.9 y (M ± σ). The patients of the main group additionally received 14 sessions of multimodal NFB training using the "Reacor" psychophysiological rehabilitation complex. The NFB training is based on the principle of self-regulation of body functions using external feedback systems. The method was developed within the framework of behavioral therapy and used successfully in the treatment of stress disorders and psychosomatic diseases. The analysis of the effectiveness of the BFB training was carried out by the dynamics of clinical and psychological indicators in patients of the main and control groups, including levels of personal anxiety (PA), reactive anxiety (RA) (Spielberger questionnaire) and depression (Beck questionnaire).

Results: A high level of personal (52.74 points) and reactive (53.11 points) anxiety was revealed in SS patients. The severity of reactive anxiety and the level of depression was decreased after the training course, but this dynamic was significant in patients of the main group only. The NFB training is characterized by the active and conscious participation of the subject in the treatment process. One of the likely mechanisms of the therapeutic effect of NFB training is the cognitive effect, learning self-control skills, which, according to patients, they have never had before. It is assumed that the use of NFB contributes to the correction of emotional status, reduction of reflex muscular-tonic syndromes, improvement of microcirculation, mobilization of volitional potential and self-esteem of patients.

Conclusion: The results indicate a positive effect of NFB on anxiety and depressive disorders in SS patients, which may contribute to improving the effectiveness of complex treatment of this disease, its long-term prognosis and the patients' quality of life.

P1109
ECONOMIC EVALUATION OF SARCOPENIA MANAGEMENT STRATEGIES IN IRAN: A COST-EFFECTIVENESS ANALYSIS

R. Heshmat[1], A. Darvishi[2], G. Shafiee[2], N. Zargar Balajam[3], S. Maleki Birjandi[2], M. Rezaei Hemami[4]

[1]National Center for Health Insurance Research, Tehran, Iran, [2]Chronic Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran, [3]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran, [4]Perspectum Ltd, Oxford, UK

Objective: The quest for identifying the most effective sarcopenia management intervention remains a paramount concern for health systems. This study delves into the cost-effectiveness analysis of sarcopenia management strategies in Iran.

Methods: Employing a lifetime Markov model rooted in natural history, we assessed seven strategies, encompassing exercise training, nutritional supplements, whole-body vibration (WBV), and various combinations of exercise and nutritional supplements, alongside a non-intervention strategy. Parameter values were sourced from both primary data and the literature. Costs and quality-adjusted life years (QALYs) were computed for each strategy. Deterministic and probabilistic sensitivity analyses, including the expected value of perfect information (EVPI), were conducted to gauge model robustness, utilizing the 2020 version of TreeAge Pro software.

Results: All 7 strategies exhibited heightened lifetime effectiveness in terms of QALYs. The protein and Vitamin D3 (P + D) strategy emerged with the highest effectiveness values. After eliminating dominated strategies, the incremental cost-effectiveness ratio (ICER) for P + D compared to Vitamin D3 alone (D) was calculated at $131,229. Considering the cost-effectiveness threshold ($25,249), the base-case results identified the D strategy as the most cost-effective. Sensitivity analysis of model parameters underscored the robustness of results, with an estimated EVPI of $273.

Conclusion: As the pioneering economic evaluation of sarcopenia management interventions, this study reveals that, despite the superior effectiveness of D + P, the D strategy emerges as the most cost-effective. The ongoing accumulation of clinical evidence across various intervention options holds the promise of refining and enhancing the accuracy of results in the future.

P1110
EFFECT OF SARCOMEAL® ORAL SUPPLEMENTATION PLUS VITAMIN D3 ON MUSCLE PARAMETERS AND METABOLIC FACTORS IN DIABETIC SARCOPENIA PATIENTS: STUDY PROTOCOL OF A RANDOMIZED CONTROLLED CLINICAL TRIAL

R. Heshmat[1], R. Abdi Dezfouli[1], G. Shafiee[1], S. Maleki Birjandi[1]

[1]Chronic Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Sarcopenia is a frequent chronic complication in diabetic patients especially in older people. The pathophysiological connection between sarcopenia and type 2 diabetes likely involves glycemic control, inflammation, oxidative stress, and adiposity. Resistance exercise is a lifestyle intervention that may improve glycemic control in older adults with T2D and sarcopenia. Since exercise is not suitable for all older people, oral supplementations may be more effective than exercise in this age range. This study aims to evaluate the efficacy of the Sarcomeal supplement, a mixture of whey protein, creatine, branch-chained amino acids (BCAA), and hydroxyl-methyl-butyrate (HMB) in diabetic sarcopenia.

Methods: This study is a randomized clinical trial, in which 60 diabetic sarcopenia patients who meet the inclusion criteria will be randomly assigned to the control or the intervention group with a 1:1 allocation. The intervention group will receive one Sarcomeal supplement sachet plus 1000 IU of vitamin D daily and the control group will be recommended to consume protein-rich food, be educated about the disease, and perform light exercises for 12 weeks. Evaluation of anthropometric parameters, body composition, muscle strength, muscle function, biochemical factors including glycemic and lipid profile, blood urea nitrogen (BUN), creatinine, high-sensitivity C-reactive protein (hs-CRP) as well as blood pressure will be done at the baseline and end of the trial. Also, medical history,

physical activity, Mini Nutritional Assessment (MNA), Activity of Daily Living (ADL) and Instrumental Activity of Daily Living (IADL), and sarcopenia-related quality of life (SarQoL) will be assessed throughout the study.
Conclusion: This study will be the first randomized clinical trial to evaluate the efficacy and safety of a mixture of whey protein, creatine, BCAA, HMB and vitamin D in diabetic sarcopenia. It is hypothesized that Sarcomeal supplement may be beneficial for the management diabetic sarcopenia by reducing inflammation and oxidative stress and glucose and lipid metabolism through various mechanisms.

P1111
ECONOMIC BURDEN OF SARCOPENIA-RELATED DISABILITY IN THE ELDERLY POPULATION: A STUDY IN IRAN

R. Heshmat[1], A. Darvishi[2], G. Shafiee[2], R. Daroudi[3], A. Nikkhah[2], S. Maleki Birjandi[2]

[1]National Center for Health Insurance Research, [2]Chronic Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran Univ. of Medical Sciences, [3]Dept. of Health Management & Economics, School of Public Health, Tehran, Iran

Objective: Sarcopenia disability, characterized by the progressive loss of skeletal muscle mass and diminished muscle function, is linked to escalating health costs, heightened risk of physical disability, diminished quality of life, increased demand for care services, and ultimately elevated mortality rates. This study aims to assess the economic impact of sarcopenia-related disability in Iran.
Methods: A prevalence-based economic burden study was conducted utilizing the population attributable risk (PAR) method, based on 2022 price indices. Prevalence data for sarcopenia, categorized by gender and disease severity, were extracted from recent comprehensive studies. The relative risk of sarcopenia disability was determined from the most robust available evidence. Subsequently, direct medical costs, direct non-medical costs, and indirect costs for each individual with sarcopenia were computed and adjusted to 2022 values to estimate disability costs. The overall economic burden of disability attributable to sarcopenia in Iran was then estimated. The cost variables were converted from the Iranian Rial (IRR) to the US dollar using the purchasing power parity (PPP) value of USD/IRR = 64,529.
Results: Taking into account the prevalence of sarcopenia and the Iranian population across various age groups, 2,192,168 adults aged $\geq$ 60 y with sarcopenia in Iran were included in the estimations. The relative risk of disability for men and women was determined to be 4.04 and 2.30, respectively. The total PAR of sarcopenia for men and women was estimated at 50% and 28%, respectively. Average direct medical costs, direct non-medical costs, and indirect costs were PPP $983, PPP $36, and PPP $156, respectively, with the total estimated cost reaching PPP $1175 for each individual with sarcopenia. The cumulative direct medical costs, direct non-medical costs, and indirect costs amounted to PPP $842 million, PPP $30 million, and PPP $134 million, respectively. Additionally, the average total economic burden of sarcopenia-related disability in the Iranian population aged $\geq$ 60 years was estimated at PPP $1006 million.
Conclusion: Sarcopenia poses a substantial economic burden on the healthcare system. Early interventions to mitigate the consequences of the disease will be pivotal in resource conservation. Expanding and augmenting scientific evidence in this regard can contribute to achieving more comprehensive and accurate results in the future.

P1112
ASSOCIATION OF RUNX2 GENE HYPOMETHYLATION WITH THE RISK OF PRIMARY OSTEOPOROSIS

B. I. Yalaev[1], R. I. Khusainova[1]

[1]Endocrinology Research Centre, Moscow, Russia

Objective: Evaluation of differential methylation of *RANKL*, *DKK1* and *RUNX2* genes in women and men with primary osteoporosis (OP).
Methods: A case–control study included 701 women (61.95 $\pm$ 7.94) and 501 men (62 $\pm$ 10.8), which included patients who underwent X-ray densitometry between 2004–2011, as well as a sex- and age-matched control group with no fractures and normal BMD levels (45% of the total sample). DNA methylation profile was analysed using bisulfite pyrosequencing (Pyromark Q24). The primer design was constructed in the GeneGlobe web platform (QIAGEN®). The Mann–Whitney test (Rstudio) was used to find significant differences in DNA methylation level in the comparison groups.
Results: Statistically significant hypomethylation of three CpG-sites in the *RUNX2* gene with the risk of OP development in men (U = 746.5, p = 0.004; U = 784, p = 0.01; U = 788.5, p = 0.01, respectively), as well as in 1 CpG-site in women (U = 537, p = 0.03) (in the position 45,387,951–45,388,050) was revealed (Fig. 1). At the same time, methylation is increased in the second and third CpG sites in women with OP both relative to the control group and relative to the average index in men (by 6%), however, the differences do not reach statistical significance ($p > 0.05$).

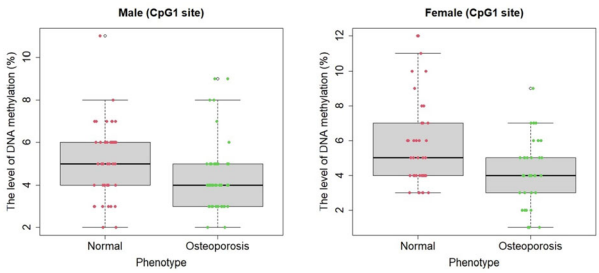


Figure 1. A boxplot of the distribution of the percentage of DNA methylation in comparison group.

Conclusion: For the first time, the level of methylation in the first CpG-site of the *RUNX2* gene was found to be reduced in women and men with primary OP from Russia. According to literature data, gene expression is increased at the early stages of differentiation of mesenchymal stem cells into osteoblast precursors; therefore, hypomethylation may lead to changes in *RUNX2* expression, resulting in impaired maturation of osteogenic cell proliferation [1–2].
Acknowledgment: This work was supported by the Ministry of Science and Higher Education of the Russian Federation (agreement No. 075–15-2022–310 from 20 April 2022).

P1113
INCIDENCE OF SUBSEQUENT FRAGILITY FRACTURES IN PATIENTS INCLUDED IN A FRACTURE LIAISON SERVICE (FLS) IN SPAIN

R. Izquierdo-Avino[1], M. Jordan-Jarque[1], D. Garcia-Aguilera[2]

[1]Fracture Liaison Service. Dept. of Trauma & Orthopaedics. Hospital Nuestra Senora de Gracia, [2]Dept. of Trauma & Orthopaedics. Hospital Royo Villanova, Zaragoza, Spain

Objective: Fragility fractures (FF) can lead to a reduction in quality of life, increased mortality and become a major risk factor of

subsequent fractures. Fracture liaison services (FLS) are designed to narrow the treatment gap emerging after these fractures. The objective of this study is to analyze the incidence of re-fracture and to identify major risk factors for re-fracture in a group of patients included in a FLS.

Methods: We conducted an observational prospective cohort study of patients aged 50 or above who sustained a FF and were included in our FLS between 2016–2022, with a follow-up of 2 y. Data on demographic characteristics, index fracture, subsequent fractures, treatment initiation and adherence were collected.

Results: A total of 2434 patients (84.4% women and 15.6% men, mean age 78.1 years old) were included in our FLS during the study period, having sustained a fragility fracture of the hip (39.1%), wrist (21.9%), vertebra (18.1%), humerus (16.6%) and other sites (4.1%). Previous fracture was present in 36.4% of patients. A total of 253 subsequent fractures were recorded (6-year cumulative incidence of 10.4%). Re-fractured patients were women in 88.8% of cases, with a mean age of 81.2 y. Most common anatomic re-fracture site was the hip (29.2%), followed by wrist (18.1%), proximal humerus (14.4%), vertebra (13.6%) and pelvic rami (7.8%). Almost 40% of patients with hip index FF sustained a subsequent hip FF. Regarding time course, 58 subsequent FF (22.9%) were sustained within the first 6 months, 42 between 6–12 months (16.6%), 72 between 12–24 months (28.4%) and 81 occurred 2 y after index FF (32%). Anti-osteoporotic drugs were initiated in 1888 patients (77.5%) and 2087 patients (85.6%) received calcium/vitamin D supplements.

Conclusion: Inclusion of patients with FF into a FLS increases the percentage of patients initiating anti-osteoporotic drugs after FF. Re-fracture was more common in women aged > 80 years, with 40% of subsequent FF sustained within the first 12 months after index FF, the hip being the most frequent anatomical re-fracture site. Patients with a hip index fracture had an increased incidence of re-fracture as compared to other fracture sites.

P1114
MORTALITY AFTER FRAGILITY FRACTURES IN PATIENTS INCLUDED IN A FRACTURE LIAISON SERVICE (FLS) IN SPAIN

R. Izquierdo-Avino[1], M. Jordan-Jarque[1], D. Garcia-Aguilera[2]

[1]Fracture Liaison Service. Dept. of Trauma & Orthopaedics. Hospital Nuestra Senora de Gracia, [2]Dept. of Trauma & Orthopaedics. Hospital Royo Villanova, Zaragoza, Spain

Objective: Fragility fractures (FF) can lead to a reduction in quality of life but have also shown to increase mortality. Fracture liaison services (FLS) are designed to narrow the treatment gap emerging after these fractures and to ensure adherence to treatment to improve clinical outcomes. The objective of this study is to analyze the incidence of mortality and to identify major risk factors for mortality after fracture in a group of patients included in a FLS.

Methods: We conducted an observational prospective cohort study of patients aged more than 50 y who sustained a fragility fracture and were included in our FLS between 2016–2022, with a minimum follow-up of 2 y. Data on demographic characteristics, index fracture, subsequent fractures, treatment initiation, adherence and mortality were collected.

Results: A total of 2434 patients (84.4% women and 15.6% men, mean age 78.1 years old) were included in our FLS during the study period, having sustained a fragility fracture of the hip (39.1%), wrist (21.9%), vertebra (18.1%), humerus (16.6%) and other sites (4.1%). Previous fracture was present in 36.4% of patients. Anti-osteoporotic drugs were initiated in 1888 patients (77.5%) and 2087 patients (85.6%) received calcium/vitamin D supplements. A total of 268 patients died during follow-up (6-y cumulative incidence 10.9%), rate being higher in male (19.7%) compared to female (9.5%); rate reached 17.4% in patients aged > 80 y. Mortality rate in re-fractured patients was 13.4% as compared with non-re-fractured patients (10.8%). Overall, mortality rate was 1.56% at 3 months and 4.52% at 1 y. Higher mortality was recorded after hip fracture (22%) followed by vertebral FF (8%).

Conclusion: Higher rates of mortality were seen in male patients aged > 80 y, patients with hip index FF, FRAX for Hip fracture > 4.5%, re-fractured patients and when vitamin D low levels were present. Nearly 40% of deaths occurred within the first year after index FF. Almost 76% of deaths were recorded in patients who had sustained an index hip FF, indicating a poor outcome after this event. High mortality rates are seen in patients with FF, which reinforces the importance of secondary fracture prevention in a FLS environment.

P1115
EFFECT OF TAI CHI AND AEROBICS EXERCISE ON COGNITION, BALANCE, CARDIOPULMONARY FITNESS AND QUALITY OF LIFE IN OLDER ADULTS

R. Joshi[1]

[1]Dr DY Patil Vidyapeeth, Pune, India

Objective: According to a WHO report, by 2030 one in six people on earth will be 60 or older. Thus, it is vital to promote autonomy to elderly, as they contribute to large portion of the population. We aimed to ascertain the effectiveness of Chen Tai Chi in comparison to aerobic exercises on cognition, balance, cardiopulmonary fitness, and quality of life in older adults.

Methods: A parallel-arm, single-blinded randomised control trial was conducted with 60 individuals between the ages of 60–75. Patients having normal cognitive function as indicated by the MOCA score, function reach test completion less than 6 inches, and a minimum 6-min walk test distance of 630 m were included in the study. Patients who had a recent serious injury, systolic blood pressure above 200 mmHg and diastolic blood pressure above 120 mmHg, major heart or lung problems, recent fractures, grade 3 or 4 OA in the knee, or a history of falling often were not included in the study. After recruitment, patients were further allocated into 3 groups: Group A Aerobics, Group B Chen Tai Chi, and Group C, the control group. Exercise sessions were 4 days per week for 4 weeks. Assessment for cognition by Montreal cognitive assessment, static balance by one leg stand test, dynamic balance by time up and go test, cardiopulmonary fitness by a 6-min walk test, and quality of life by a health-related quality of life scale taken at baseline, post-completion, and follow-up.

Results: The data revealed that aerobics, Tai-chi, and the control group showed improvement regarding cognition and static balance at post-completion and follow-up. Within group analysis, aerobics showed statistically significant improvement (cognition $p = 0.0001$, static balance $p = 0.01$). There were no statistically significant differences between the aerobics, Tai-chi, and control groups in dynamic balance, cardiopulmonary fitness, or quality of life. However, there were statistically significant improvements in these areas within the aerobics group (dynamic balance, $p = 0.0009$; cardiopulmonary fitness, $p = 0.03$; and quality of life, $p = 0.0001$).

Conclusion: Aerobics, in comparison to Chen Tai Chi and control, had greater physical and functional capacity along with quality of life, which will be helpful to prevent frailty and enhance autonomy in the elderly.

P1116
DIAGNOSTIC CRITERIA FOR ADULT HYPOPHOSPHATASIA: EXPERIENCE FROM A UK CENTRE

M. Vidal[1], J. Bubbear[1], T. Gill[1], R. Keen[1]

[1]Centre for Metabolic Bone Disease, Royal National Orthopaedic Hospital, Stanmore, London, UK

Objective: Hypophosphatasia (HPP) is a rare, genetic metabolic disorder characterized by reduced activity of serum alkaline phosphatase (ALP) and various symptoms from life-threatening, severely impaired mineralization at birth to musculoskeletal pain in adulthood. HPP is diagnosed with laboratory findings, genetic analysis of the ALPL gene, and clinical features although the diagnosis is often delayed. An International Working Group has recently published consensus diagnostic criteria to assist the clinical diagnosis of HPP[1]. This study has evaluated these criteria in adult HPP patients attending a single specialist clinic.
Methods: We reviewed the medical records of adults with a clinical diagnosis of HPP. Details of their clinical history, laboratory results and radiological imaging were compared against the proposed diagnostic criteria.
Results: In total, data was available on 18 patients (16 female, 2 male). The mean age of the patients was 39.4 y (range 19–68). The breakdown of the major and minor diagnostic criteria are shown in Table 1. It is proposed, that the diagnosis of HPP is supported by the presence of 2 major, or 1 major and 2 minor criteria. Using this classification, only 7 patients (39%) fulfilled the diagnosis of HPP.

Table 1.

	Diagnostic HPP criteria in 18 adults	Yes (%)	No (%)
Major	– Pathogenic or likely pathogenic ALPL gene variant	14 (78%)	4 (22%)
	– ↑ natural substrates[+]	11 (91%)	1 (8%)
	– Atypical femoral fractures (pseudo-fractures)	0	18 (100%)
	– Recurrent metatarsal fractures	0	18 (100%)
Minor	– Poorly healing fractures	2 (11%)	16 (89%)
	– Chronic musculoskeletal pain	16 (89%)	2 (11%)
	– Early atraumatic loss of teeth	2 (11%)	16 (89%)
	– Chondrocalcinosis	0	18 (100%)
	– Nephrocalcinosis	0	18 (100%)

[+]performed in 12 patients

Conclusion: Our data have demonstrated that the diagnosis of HPP remains challenging. Further evaluation of these criteria in different clinical cohorts will be needed and they may be adapted over time. In addition, the International HPP Registry could act as a useful resource to study the utility of these criteria.
Reference: (1) Khan AA et al. Osteoporos Int 2024;35:431.

P1117
A CASE REPORT OF SIMULTANEOUS IPSILATERAL NECK OF FEMUR FRACTURE AND ATYPICAL FEMUR FRACTURE IN A 92-YEAR-OLD WOMAN WITH PROLONGED ORAL BISPHOSPHONATE EXPOSURE

L. A. Ali[1], D. F. Fitzpatrick[1], R. L. Lannon[1], K. M. Mccarroll[1], N. F. Fallon[1], N. M. Maher[1], J. C. Carraher[1]

[1]Mercer's Institute for Research and Ageing, St James's Hospital, Dublin, Ireland

Atypical femoral fracture is a well described uncommon complication of prolonged bisphosphonate therapy. Here we describe a case of simultaneous neck of femur fracture and ipsilateral incomplete atypical femoral fracture (AFF).
Case report: The patient was a 92-year-old female with a history of osteoporosis, dyslipidaemia and uterine prolapse who had been taking alendronate for at least 10 y prior. She was admitted following a fall from standing height which resulted in a right neck of femur fracture. Further examination of her initial X-ray demonstrated a simultaneous ipsilateral sub trochanteric incomplete AFF. She had no prodromal pain. Her neck of femur fracture was treated with hemi arthroplasty which also stabilised her incomplete AFF, and alendronate was stopped. MRI excluded contralateral AFF. Densitometry performed after the fractures demonstrated a T-score of -2.5 in her lumbar spine, -2.7 at the left neck of femur and -2.0 at the left total hip. Serum cross-linked CTX measured 8 months after initial presentation was 0.261 ng/ml. She subsequently suffered an atraumatic grade 2 vertebral fracture 18 months later and teriparatide was initiated which she stopped due to the burden of daily injections.

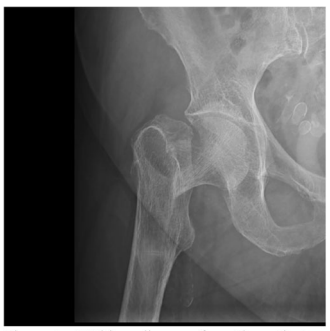


Figure 1. AP hip radiogram from the patient on admission; showing fracture neck of femur in addition to ipsilateral undisplaced atypical femoral fracture

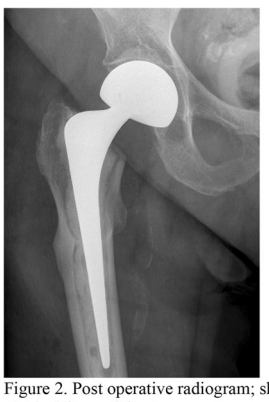


Figure 2. Post operative radiogram; showed hemi arthroplasty, which also stabilized the atypical femoral fracture.

Conclusion: Patients presenting with AFF may also have severe osteoporosis which presents a therapeutic challenge; there is a high

level of uncertainty in the optimal approach in these patients. Teriparatide is a potent treatment for osteoporosis and has also been shown to improve healing of surgically treated AFF. AFF has historically been underdiagnosed and this case highlights the need for vigilance for this complication in patients with prolonged antiresorptive therapies. AFFs can frequently be bilateral, and it is important to adequately image both femora.

P1118
RELATIONSHIP BETWEEN WORK INSTABILITY AND QUALITY OF LIFE AMONG PATIENTS WITH SPONDYLOARTHRITIS

R. L. Rouached[1], Z. S. Zanned[1], B. S. Bouden[1], B. A. Ben Tekaya[1], M. I. Mahmoud[1], T. R. Tekaya[1], S. O. Saidane[1], A. L. Abdelmoula[1]

[1]Rheumatology Dept., Charles Nicolle Hospital Tunis, Tunis, Tunisia

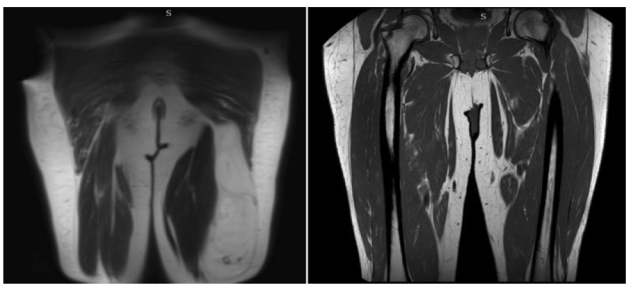
Objective: Quality of life (QoL) is a subjective measure encompassing various well-being indicators, including health, social interactions, and socioeconomic factors such as employment and economic status. Spondyloarthritis patients often face pain, stiffness, and physical limitations that can affect their professional stability. This study aims to assess the impact of work instability on the quality of life in patients with spondyloarthritis.
Methods: A prospective study was conducted on spondyloarthritis patients at a rheumatology department. Patient demographics (age, gender, educational level), disease-related parameters (disease activity, duration, treatment), comorbidities, and job characteristics were collected. The Work Instability Scale was used, it is classified into three categories: low (< 10), medium (10–17), and high (> 17) risk. Quality of life was evaluated using the Arabic Tunisian version of the SF-36 short form questionnaire.
Results: 41 patients participated with a mean age of 39.34 ± 12.58 and 73.2% were males. Educational levels were 31.8% elementary, 44% high school, and 24.4% university. Work sectors comprised 29.3% public, 34.1% private, and 36.6% independent. Job categories included agriculture (12.2%), manufacturing (14.2%), building (17%), trading (12.2%), education (4.9%), administration (4.9%), and security (7.3%). Mean working hours were 8.35 ± 1.4. Job demands included physical demands (63.4%), mental demands (26.8%), and a combination of both (9.4%). The onset age of the disease was 31.8 ± 10.68 y. Disease characteristics included disease activity measures (BASDAI = 3.08 ± 1.6 and ASDAS-CRP = 2.53 ± 1.13), with 58.5% having moderate to high disease activity. BASFI.
indicated a mean of 4.18 [0.5–8.5]. SF36 scores averaged 62 ± 17.2: Physical functioning 65.73 ± 20.23, Role physical 48.78 ± 24.55, Bodily pain 68.84 ± 18, Social functioning 67.72 ± 16.1, Mental health 61.78 ± 29.41 Role emotional 65.14 ± 14.8, Vitality 62.2 ± 19 and Global health 55.48 ± 14.35 Work instability was present in 58.8% of patients, with a mean AS_WIS of 11.17 [2–18]. Workplace adaptations were noted in 41.5% of the cases and involved: adapted furniture/tools (5%), reduced tasks/duties (2.4%), and fewer working hours (29.3%). Lower educational level was associated with lower SF36 scores, particularly in social and vitality dimensions ($p = 0.04$ and $p = 0.02$, respectively). Quality of life score SF36 was significantly negatively correlated to AS-WIS ($R = -0.63$, $p < 0{,}001$). In addition, work instability correlated to disease activity indexes BASDAI and ASDAS ($R = 0.58$; $p < 0.001$ and $R = 0.46$; $p = 0{,}004$ respectively).
Conclusion: Professional stability significantly influences quality of life in spondyloarthritis patients. Regular evaluation and intervention on associated factors are crucial to enhance and promote overall quality of life during follow-up care.

P1119
A CASE OF ATYPICAL LIPOMATOUS TUMOR

R. M. Runcheva[1], M. B. Markovski[2], K. A. Karpicharova[3]

[1]Private orthopedic practice Ortomedik, Shtip, [2]Private orthopedic practice Ortomedika, Kumanovo, [3]PHO Clinical Hospital Shtip, Shtip, North Macedonia

Atypical lipomatous tumor (ALT) is a locally aggressive but non-metastasizing adipocytic neoplasm that primarily occurs in the proximal extremities of middle-aged to older adults. Histologically, ALT is divided into adipocytic (lipoma-like), sclerosing and inflammatory subtypes. ALT can occur at any age but has a peak incidence in the fifth to seventh decades of life, with no sex predilection. It most frequently occurs in the deep soft tissue of the extremities, especially the thigh. The retroperitoneum, trunk and para testicular area are also commonly involved. Surgery is the mainstay of treatment for ALT. However, there is no consensus regarding the best surgical treatment for deep-seated ALT of the extremities.
Case report: A 57-year-old male presented with soft tumor in posterior area of left thigh, without pain, disability or neurological symptoms. He first felt the swelling in the back of his left thigh around a year ago, but within the previous 2–3 months, the alteration has become more noticeable. After set of Lab, RTG, KT and MRI investigations, an indication for operative treatment on the thigh has been set and it was carried out 6 weeks after the alteration was detected. The tumor, which weighed 1330 g and measured 21 $\times$ 17x9 cm, was surgically removed. The tumor was clearly limited in relation to surrounding structures, but due to the extensive surgical intervention, a permanent lesion of the left peroneal nerve occurred postoperatively. Due to the large cavity that was present, seroma has been created postoperatively, which was evacuated percutaneously on several occasions. After the obtained histopathological findings, an oncologist was consulted, the treatment was limited to surgical intervention only, without radiotherapy and chemotherapy due to the proven benignity of the lesion. 18 months after the surgical intervention, there are no signs of local recurrence.



Conclusion: The management of choice in atypical lipomatous tumors is resection, which is curative if complete. These tumors are not sensitive to radiotherapy or chemotherapy. Tumor prognosis and the likelihood of local recidive depend on the risk of dedifferentiation and on how amenable the location is to surgical excision. The tumors do not cause distant metastasis unless there is dedifferentiation. Patients with tumors affecting the extremities have a very good prognosis with $> 90\%$ survival after 10 y of follow-up and thus the name atypical lipomatous tumor. For selected patients with atypical lipomatous tumors of the extremities, active surveillance has been suggested as a viable option to prevent overtreatment.

P1120
PREVENTIVE EFFECT OF TRANSCUTANEOUS CO2 APPLICATION ON DISUSE OSTEOPOROSIS AND MUSCLE ATROPHY IN A RAT HINDLIMB SUSPENSION MODEL

R. Nishida[1], T. Fukui[1], K. Oe[1], Y. Kumabe[1], H. Kondo[1], Y. Yamamoto[1], K. Takase[1], R. Yoshikawa[1], T. Niikura[2], R. Kuroda[1]

[1]Univ. of Kobe, [2]Hyogo Prefectural Nishinomiya Hospital, Kobe, Japan

Objective: We previously demonstrated transcutaneous CO_2 application promotes muscle fiber-type switching, fracture healing and osteogenesis through increasing blood flow and angiogenesis. The aim of this study is to investigate the preventive effects of transcutaneous CO_2 application on disuse osteoporosis and muscle atrophy using a rat hindlimb suspension model.
Methods: 11-week-old male Sprague Dawley rats were divided into hindlimb suspension (HS), HS with transcutaneous CO_2 application ($HSCO_2$), and control groups (n = 7 per group). The HS group underwent a 30° head-down tilt to keep hindlimbs off the ground. In the $HSCO_2$ group, hindlimbs were similarly suspended and exposed to transcutaneous CO_2 application using hydrogel sealed in a polyethylene bag filled with 100% CO_2 gas, five times a week for 20 min. After 3 weeks, we harvested the gastrocnemius, femur, and tibia for assessment.
Results: The histological cross-sectional area of gastrocnemius myofiber was significantly decreased in HS compared to the control, whereas in HSCO2, it was significantly increased compared to HS. Microcomputed tomography revealed femoral trabecular and cortical atrophy in HS compared to control rats, with significant improvement observed in $HSCO_2$. Histological analysis of the proximal tibia in HS revealed more marrow adipose tissue than in the control. However, in $HSCO_2$, fewer marrow adipose tissue and osteoclasts were observed, while more osteoblasts exhibited with higher expression of PGC-1a and VEGF compared to HS. Real-time PCR showed elevated expression of myogenesis and angiogenesis markers in $HSCO_2$ gastrocnemius compared to HS, with opposite changes in atrophic markers. In the distal femur, osteogenesis and angiogenesis markers were also upregulated in $HSCO_2$ compared to HS.
Conclusion: Transcutaneous CO_2 application effectively prevents disuse osteoporosis and muscle atrophy in a rat hindlimb suspension model by activating the angiogenic pathway.

P1121
USING CATEPSIN K ACTIVITY AS A BIO-MARKER FOR OSTEOPOROSIS RESPONSE TO ALENDRONATE

R. Novac[1], I. C. Popescu[2], V. A. Cotirlet[3]

[1]Emergency Hospital Moinesti, Bacau, [2]Romanian Academy of Human Sciences, Bucharest, [3]Vasile Alecsandri Univ., Bacau, Romania

Objective: Osteoporosis has been an excruciating disease for many years now and although many treatments have been developed, our concern now needs to focus on finding better ways to precociously diagnose and monitor treatment. New biomarkers are crucial for the diagnosis or prognosis of a disease as well as elucidating the mechanism of drug action and improve decision making. Cathepsin K is a cysteine protease that cleaves collagen type I, the major type of collagen found in bone, so it is useful to measure to assess the function and number of osteoclasts. The aim of the current study was to evaluate the fluctuation of cathepsin K, phosphorus, 25 HO vitamin D, alkaline phosphatase and PTH before and after 6 and 12 months of treatment with alendronate.
Methods: We recruited samples from 28 female patients with osteoporosis and 15 healthy controls. All subjects were menopaused, non-diabetic, non-obese, all causes of secondary osteoporosis were excluded. All osteoporosis diagnosticated patients were treated with alendronate and calcium and vitamin D supplements.
Results: Serum cathepsin K activity was determined in 28 women with postmenopausal osteoporosis before and after 6 and 12 months of treatment with alendronate. Basal serum cathepsin K activity levels were also compared to postmenopausal women without osteoporosis (n = 15). We also measured phosphorus, alkaline phosphatase, PTH and 25 HO vitamin D. We observed that serum cathepsin K activity levels were higher in postmenopausal women with osteoporosis (9746.07 $\pm$ 1824 pmol/L) compared with healthy postmenopausal women (7747.33 $\pm$ 762.67 pmol/L; $p < 0.01$). Also, serum cathepsin Ka decreases gradually after alendronate treatment (5.09% at 6 months, and 7,17% at 12 months, $p < 0.05$). We also found a positive association of cathepsin K and phosphorus and PTH and a negative association with 25 HO vitamin D.
Conclusion: Serum cathepsin K activity may serve as additional marker of bone metabolism in postmenopausal women treated with alendronate and also a possible risk marker in postmenopausal women without osteoporosis.

P1122
EXPECTED LOSS OF PRODUCTIVITY FOLLOWING FRAGILITY FRACTURES IN PATIENTS OF WORKING AGE

R. Pinedo-Villanueva[1], J. Griffin[2], L. Wiggins[2], N. Nicola[3], C. Jones[2], M. K. Javaid[1]

[1]Univ. of Oxford/ NDORMS, Oxford, [2]Royal Osteoporosis Society, Bath, [3]Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, UK

Objective: The economic impact of osteoporotic fractures has been extensively studied in terms of health and social care expenditures. However, their impact on productivity losses remains underexplored.
Methods: A survey targeting Royal Osteoporosis Society members was developed to gather data on demographic variables, fractures, and changes in employment status (following Office of National Statistics (ONS) classifications) after fracture. Annual loss of earnings was estimated by apportioning the total number of fractures in England (from National Hip Fracture Database and rule of 5) in people aged 50–67 y (from Oxfordshire Fracture Prevention Service) to each ONS occupation category according to the England 2021 Census. Expected numbers of fractured people by occupation were multiplied by corresponding% of those surveyed taking early retirement or stopping their job due to the fracture, with total loss estimated by applying annualised ONS 2023 weekly earnings.
Results: The survey, conducted from 15/08/2023 for 2 weeks, received responses from 354 adults aged 50–70 y (mean 67.9, 93% women) who reported a fracture. Prior to the fracture, 42.1% were in full-time paid employment, 29.3% in part-time employment, 5.2% were volunteers, 20.1% retired, and 3.4% unemployed. The most common job categories were professional (40.5%) and administrative (17.0%). 61.4% of respondents reported a change in employment after fracture, with 29.0% ceasing work, 24.1% taking early retirement, and 46.3% modifying their job, hours, or duties. Median duration of job absence was 8 weeks (IQR 42–90 d) for those who returned to work. The direct loss of earnings from fractures from early retirement and cessation of work was estimated to be £1.01 billion per annum.
Conclusion: This study provides an estimation of productivity losses resulting from fragility fractures in UK adults aged 50 y and over. Given the aging demographic and policies promoting extended workforce participation, the potential economic benefits of effective

osteoporosis management in preserving employment and productivity warrant further exploration.

P1123
LEVEL OF MARKERS CTX-I AND CTX-II IN EXPERIMENTAL OSTEOARTHRITIS AND HYPOTHYROIDISM

D. Nosivets[1], V. Povoroznyuk[1], R. Povoroznyuk[1]

[1]D.F. Chebotarev Institute of Gerontology NAMS Ukraine, Kyiv, Ukraine

Objective: To study the changes in the level of CTX-I and CTX-II under the influence of NSAIDs and paracetamol in experimental osteoarthritis (EOA) and hypothyroidism (EH).
Methods: Experimental studies were performed on 75 white mature nonlinear rats of both sexes. On 42 day all animals divided into 14 research groups of 5 rats in each group. Group I—rats with EOA + EH without «treatment» and rats of other groups were administered the appropriate drugs. The drugs were administered daily from day 42 of the experiment for 5 days. The quantitative level of CTX-I and CTX-II in serum was performed by specific kits system Elabscience, Inc. (USA). The blood samples were obtained from the tail vein of the rats by means of puncture using a vacuum system on 42 and 47 days. The duration of administration of the drugs was 5 days and by the 47th day of the experiment all animals after the collection of biological material were removed from the study by decapitation under general anesthesia.
Results: Based on the study, it was found that the degree of influence on degenerative-dystrophic processes in bone tissue, which was assessed by the level of the marker CTX-I in the serum of rats, the studied drugs were as follows: diclofenac sodium > ibuprofen > nimesulide = meloxicam > celecoxib > paracetamol. According to the degree of influence on degenerative-dystrophic processes in cartilage tissue, which were assessed by the level of marker CTX-II in the serum of rats, the studied drugs were as follows: nimesulide > celecoxib > meloxicam > ibuprofen > diclofenac sodium > paracetamol.
Conclusion: Determination of the level of CTX I allows to evaluate of the activity of osteoclasts by the number of breakdown products of type I collagen against the background of EOA and EH. Determining the level of the marker CTX II allows to assess the severity of degenerative-dystrophic changes in cartilage tissue by the level of breakdown products of type II collagen on the background of EOA and EH and the appointment of drugs that were studied.

P1124
RECONSTRUCTION OF PECTORALIS MAJOR MUSCLE TENDON INJURY USING SUTURE ANCHORS: A RETROSPECTIVE REVIEW

R. Ratra[1], V. Shetty[1]

[1]Blackpool Victoria Teaching Hospital NHS foundation Trust, Blackpool, UK

Objective: Pectoralis major muscle rupture is one of the most infrequently occurring sports/exercise injuries. This is not commonly observed by sport surgeons around the globe. In this article, we report our experience of repairing ten cases of pectoralis major muscle complete tendon tears, which were further assessed for clinical and functional results.
Methods: In this retrospective observational study, we studied results of 10 cases with complete pectoralis major muscle tears from January 2021 to January 2023. All of them underwent repair using three suture anchors in a triangular configuration to get a better anatomical footprint at the insertion site on humerus, along with box-suture bites through the muscle-tendinous unit to provide a better bulk of muscle available for repair in chronic cases. ASES score and Bak's criteria were used for functional evaluation for the next 6 months following surgery.
Results: The ASES score improved from 46.33 ± 9.83 pre-op to 97.5 ± 2.73 post-op for acute cases (p – 0.0001), while for chronic cases it went from 52.33 ± 12.31 to 95.77 ± 3.53 (p – 0.0001). According to ASES score and Bak's criteria, patients had a good result at 3 months post-surgery which improved to excellent result with good shoulder ROM and strength and without any functional impairment at 6 months post-surgery.
Conclusion: Suture anchor fixation in a triangular configuration with box-suture bite technique provides excellent functional and cosmetic results. Suture anchor technique overall seems to be superior as compared to other techniques as it has biomechanical strength equal to transosseous and does not have various disadvantages associated with TOS technique.

P1125
BONE HEALTH FOR THE SPINE PATIENT

P. Anderson[1], R. Roy[2], D. Lee[2], T. Schuler[3]

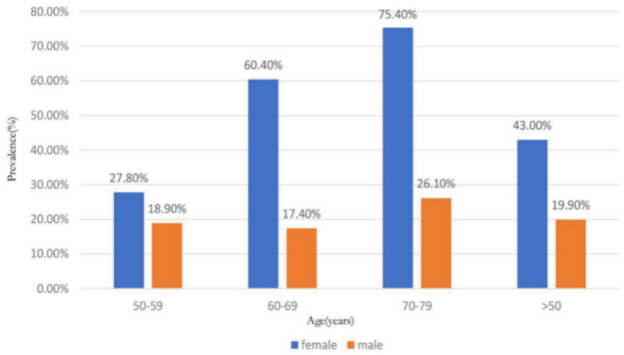
[1]Univ. of Wisconsin School of Medicine, Madison, Wisconsin, [2]National Spine Health Foundation, Reston, Virginia, [3]Virginia Spine Institute, Reston, Virginia, USA

The National Spine Health Foundation (NSHF) is the pre-eminent patient advocacy organization in spinal health care. It is the only patient-centered USA non-profit organization dedicated to helping patients overcome debilitating spinal conditions and take back their lives through patient education, award-winning research, and patient advocacy. NSHF gives patients the tools they need to make informed decisions about their spine health and navigate their own treatment journeys with confidence.

NSHF serves a critical gap in spinal health by representing the voice for patients, in connection with premiere professional societies through the Coalition for Spine Health, and fueled in partnership with industry leaders through our Spine Health Leadership Council. Our stated mission is to improve spinal health through patient education, patient advocacy, and clinical outcomes research.

We achieve much of our mission through our digital outreach efforts including our award-winning website, www.spinehealth.org. We steward a vibrant community through our Spinal Champion pro gram where patients share their successful spine health journeys to give hope and help to others seeking real answers. These Spinal Champion stories are featured on our Get Back To It podcast. Our prestigious Medical & Scientific Board volunteer their expertise to contribute to our content primarily through our premiere video edu cation offering, Spine-Talks, and through our bi-annual Spine Health Journal.

NSHF is leading a number of efforts to address key educational patient and health care professional gaps in spine care and osteoporosis, given the high prevalence of osteoporosis in patients undergoing spine surgery [PLoS One 2023; 18(5): e0286110]:



NSHF efforts to drive education and awareness regarding the connection between spine and bone health include:

1. Establishment of a *Bone Health & Your Spine* Task Force comprised of leading spine surgeons, both orthopedic and neurosurgery trained, who are committed to promoting bone health/osteoporosis prevention for spine patients through education, advocacy, and research.

2. Development of patient and professional education materials focused on comprehensive bone health assessment, pre-operative evaluation, and bone health optimization (including a health care professional survey to assess key gaps and opportunities to improve osteoporosis screening, diagnosis, and treatment in spine patients).

3. In partnership with the members of the NSHF Medical & Scientific Board, and members of the Coalition for Spine Health, a coalition dedicated to advancing spinal patient health, disseminate patient and health care professional tools in support of the release of the North American Spine Society (NASS) Diagnosis and Treatment of Osteoporotic Vertebral Compression Fractures in Adults clinical practice guideline and appropriate use criteria**.** (The members of the Coalition for Spine Health include the Cervical Spine Research Society, Lumbar Spine Research Society, North American Spine Society, and Setting Scoliosis Straight Foundation in addition to NSHF).

4. Spine-Talks expert panel videos and special edition of the NSHF Spine Health Journal focused on spine health and osteoporosis. Spine-Talks is NSHF's leading patient education platform that to date has disseminated more than 150 patient and provider videos on a variety of spine health topics produced with national clinical and patient experts (which currently includes 8 videos focused on osteoporosis).

P1126
OSTEOPOROSIS TREATMENT IN A YOUNG PATIENT WITH SECONDARY HYPERPARATHYROIDISM ON PROGRAMMED HEMODIALYSIS: CASE REPORT

R. Salimkhanov[1], E. Karaseva[1], H. Bagirova[1], A. Eremkina[1], N. Mokrysheva[1]

[1]Endocrinology Research Centre, Moscow, Russia

Osteoporosis with low-energy fractures is common in patients with advanced chronic kidney disease (CKD), including those on hemodialysis. There are various anti-osteoporotic medications, but the choice of therapy for these patients requires a complex, individualized approach.

Case report: A 37-year-old female patient, K., with secondary hyperparathyroidism (SHPT) due to end-stage CKD caused by chronic glomerulonephritis, received hemodialysis for 11 y. PTH exceeded 5000 pg/mL due to irregular monitoring and therapy. In 2021, x-ray showed L_{1-2} vertebral compression fractures (VCF) (Table 1).

Table 1. BMD at DXA (Z-score)

Date:	Lumbar Spine, SD	Femur Neck, SD	Total Hip, SD	Radius 33%, SD	Radius Total, SD
12.18	-2,0	-2,6	-	-	-
12.18	X-ray – compressions L_{1-2}				
03.22	-3,9	-2,7	-3,2	-4,1	-4,2
03.22	X-ray – compressions Th_{9-11}, L_{2-3} (6-18%)				
03.22	Total parathyroidectomy, left hemithyroidectomy (histology – parathyroid hyperplasia)				
09.22	X-ray – new compression fracture Th_8 (45%), compressions $Th_{5,9-10,12}$, L_{2-3} (4-18%)				
04.23	-0,7	-0,2	-1,3	-2,8	-2,8
04.23	X-ray – VCF progression Th_{7-9}, L_4 (20-55%), $Th_{4,10-12}$, L_{2-3} (5-15%)				

Despite medical therapy PTH remained elevated—3786 pg/mL, $Ca_{adj.}$—1.9 mmol/L (2.15–2.55), P—1.2 mmol/L (0.72–1.54) and ALP—1595 U/L (40–150). Neck US and CT showed hyperplasia of four parathyroid glands with a maximum size—3.4 × 2.4x2.0 cm. March 2022 K. underwent a total paraadenomectomy, left-sided hemithyroidectomy (Table 1). Post-surgery PTH decreased to 25 pg/mL, thus she was discharged on alfacalcidol 2 µg/d, Ca carbonate 1000 mg/d. At 6-month follow-up after surgery, the patient presented with chronic postoperative hypoparathyroidism (HypoPT): PTH—14.4 pg/mL, $Ca_{adj.}$—2.1 mmol/L, P—1.1 mmol/L and increased ALP—257 U/L. Due to multiple VCFs, persistent ALP elevation and the risk of hypocalcemia, the medical committee prescribed antiresorptive therapy with an oral bisphosphonate—alendronic acid 70 mg/week. One year after surgery, ALP level decreased to 107 U/L, x-ray confirmed new VCFs despite bisphosphonates treatment. Antiosteoporotic therapy was changed to anabolic – teriparatide 20 µg/d, in combination with alfacalcidol and Ca supplements. Continued observation.

Conclusion: Osteoporosis therapy in patients with end-stage kidney disease, requires an individualized approach that takes into account multiple factors to select the most appropriate medication.

P1127
EVALUATION OF THE RELATIONSHIP BETWEEN THORACIC KYPHOSIS AND QUADRICEPS MUSCLE THICKNESS WITH BALANCE AND FALL RISK IN WOMEN WITH POSTMENOPAUSAL OSTEOPOROSIS

E. Peker Belene[1], Z. U. Akarırmak[1], R. Terlemez[1], O. A. Kargın[2]

[1]Dept. of Physical Medicine and Rehabilitation, Istanbul Univ.-Cerrahpasa, Cerrahpasa Medical Faculty, [2]Dept. of Radiology, Istanbul Univ.-Cerrahpasa, Cerrahpasa Medical Faculty, Istanbul, Turkey

Objective: To determine the impact of thoracic hyperkyphosis, sarcopenia and quadriceps muscle thickness evaluated by ultrasonography (USG) on balance, fall risk and functional parameters in women with postmenopausal osteoporosis, to assess their interrelationships and to compare the clinical characteristics of sarcopenia and thoracic hyperkyphosis.

Methods: 103 women aged 50 or older with postmenopausal osteoporosis according to the WHO criteria and/or who had an osteoporotic vertebral fracture, were enrolled in the study. The Cobb angle of thoracic kyphosis was calculated radiographically, quadriceps muscle thickness on the anterior thigh was measured by USG and the presence of sarcopenia was determined by evaluating hand grip strength and chair stand test (CST). Patients were then divided into groups based on the presence of thoracic hyperkyphosis and sarcopenia. Balance, fall risk and physical function were assessed with tandem stance and gait test, Berg balance scale (BBS), timed up and go test (TUG) and CST.

Results: Quadriceps muscle thickness was found to be significantly lower in patients with thoracic hyperkyphosis. Linear regression analysis revealed that the presence of sarcopenia increased TUG score by 2,12 times and CST score by 4,64 times. The presence of thoracic hyperkyphosis was not an effective variable for TUG and CST. A

one-unit increase in quadriceps muscle thickness/BMI ratio decreased the TUG score by 4,17 times and increased the BBS score by 3,96 times. A one-unit increase in the Cobb angle of thoracic kyphosis reduced the BBS score by 0,04 times.
Conclusion: In our study, it was observed that balance and functional parameters were more affected by sarcopenia than thoracic hyperkyphosis. A decrease in quadriceps muscle thickness poses a risk for thoracic hyperkyphosis and deterioration in balance and physical function. Identifying the sarcopenia via evaluating quadriceps muscle thickness by USG, and considering it in the management of women with postmenopausal osteoporosis are crucial to prevent falls, to reduce morbidity and mortality.

P1128
IS THERE A LINK BETWEEN OSTEOPOROSIS AND NAIL PLATE THICKNESSES?

R. Terlemez[1], B. Ugur[1], E. Aygun[1], S. Tuzun[1]

[1]IUC Cerrahpasa School of Medicine, Istanbul, Turkey

Objective: The relatively new idea of "bone quality" appears to be able to close the gaps in our understanding of osteoporosis prediction using bone mineral densitometry. The aim of this study was to investigate the ultrasonographic nail plate thicknesses of postmenopausal women with osteoporotic fractures.
Methods: In this case–control study 15 postmenopausal women with a history of fragility fracture and 16 controls recruited from our outpatient clinic. All fingers of the patients' dominant hand were evaluated by using the ESAOTE My Lab 70 model ultrasound device, with a 6–18 MHz linear probe. The nail plate was identified by measuring the distance between the upper border of the dorsal plate and the lower border of the ventral plate. Based on the Wortsman categorization, morphological examination was performed[1]. Before enrolling the cases we conducted a preliminary evaluation to demonstrate the intra-rater reliability of ultrasonographic nail measurements.
Results: The 2nd, 3rd, 4th and 5th nail plate thicknesses of the postmenopausal women with osteoporotic fractures were significantly lower than the controls ($p < 0,05$), while there was no significant difference between the groups in terms of Wortsman morphological scores. This relationship was independent of age, BMI, and BMD values.
Conclusion: Only a small number of studies assessing nail health in individuals with osteoporosis have been reported in the literature[2]. Although most of previous investigations used spectroscopy, this study is the first to use ultrasound to assess the morphology and thickness of the nail plate in patients with osteoporosis.
References:
1. Wortsman X, et al. Clin Rheumatol 2011;30:739
2. Saeedi P, et al. J Funct Biomater 2018;9:31

P1129
ACTIVITIES OF THE OSTEOPOROSIS PATIENT SOCIETY OF TURKEY FOR THE PREVENTION OF CLINICAL AND SOCIAL BURDEN OF OSTEOPOROSIS AND FRACTURES BY 'BUILDING BETTER BONES'

U. Akarırmak[1], S. Tuzun[1], R. Terlemez[1], N. Eskiyurt[1], M. Sarıdoğan[1]

[1]İstanbul Univ.-Cerrahpaşa, İstanbul, Turkey

Objective: To share some of the work and activities the Osteoporosis Patient Society of Turkey, organized for prevention of osteoporosis and fractures in 2023. 'Building better bones' is essential, in childhood, adolescence and then still in later years.
Methods: Education about prevention of osteoporosis and fractures at all ages was provided by printed educational material, prepared by the Turkish Osteoporosis Society and Osteoporosis Patient Society of Turkey, as well as face-to-face information in the Osteoporosis Outpatient Clinics in a University Hospital in İstanbul. Educational material included osteoporosis exercises (weight-bearing and resistance, performed for 30–40 min, three to four times a week, posture and balance exercises), also regular physical activity, bone healthy nutrition, and vitamin D sources. Prevention of falls as an important issue in individuals over 65 was included.
Results: As clinically all types of fractures cause some limitation of daily function, social and economic burden on the patient, the family, the caregiver as well as the whole system due to disability, treatment costs and rehabilitation. On World Osteoporosis Day WOD2023 for awareness on a larger platform we organized an outdoor event in Bebek location at the Bosphorus/İstanbul. Posture, aerobic and balance exercises were guided by a physiotherapist and performed together with patients, MDs and healthy adults all wearing printed t-shirts with osteoporosis concept. A video of this activity, was taken by a drone from the air, including a bone shape formed by participants, and shared on many social media platforms, local TVs and local newspapers.
Conclusion: Messages on WOD2023 by the presidents of two societies, the Turkish Osteoporosis Society and Osteoporosis Patient Society of Turkey were delivered at the end of the activity concerning 'Building better bones', especially exercises, nutrition and lifestyle. Q&As of young and elderly participants were carefully addressed.

P1130
EFFECT OF INTEGRATED NEUROMUSCULAR INHIBITION TECHNIQUE ON PAIN AND DISABILITY IN UPPER TRAPEZIUS MYOFASCIAL TRIGGER POINTS IN POSTMENOPAUSAL WOMEN

R. Thakur[1], A. Kaur[1], G. Msp[1]

[1]MVPS College of Physiotherapy, Nashik, India

Objective: This study was designed to inspect the effectiveness of integrated neuromuscular inhibition technique (INIT) on pain, cervical range of motion, and disability in upper trapezius myofascial trigger points in postmenopausal women.
Methods: 30 subjects with active trigger points were selected based on the inclusion criteria received INIT three times/week for two weeks. Numeric Pain Rating Scale (NPRS), Neck Disability Index (NDI) and Active Cervical Range Of Motion (CROM) were used to evaluate subjects at two intervals (pre-treatment and post-treatment).
Results: Statistical analysis show that there is a significant change within-group for NPRS, NDI and CROM (lateral flexion) pre and post treatment with a $p < 0.0001$ for subjects with upper trapezius trigger points.
Conclusion: INIT is effective in reducing pain and disability in upper myofascial trigger points.

P1131
INVESTIGATING THE RELATIONSHIP BETWEEN FEAR OF FALLS AND UPPER EXTREMITY MUSCLE STRENGTH IN CLINICAL HOSPITAL SETTINGS

R. Thakur[1], A. Kaur[1]

[1]MVPS College of Physiotherapy, Nashik, India

Objective: Falls pose a significant clinical concern, impacting a diverse population across different settings. Around one-third of individuals residing in the community and three-quarters of those in

nursing homes aged over 60 experience yearly falls. Regrettably, some fatalities result from these incidents. Consequently, the prevention of falls becomes paramount. We aimed to investigate the relationship between fear of fall and strength of the upper extremity.
Methods: This is a cross-sectional study which included ambulatory and hospitalised patients above the age of 60 years and those who were immobile and walking with assistance, and severe neurologic disorders were excluded from the study. Participants underwent geriatric assessments, including the Mini-Mental State Examination, alongside physical evaluations like handgrip, key pinch, and the 6-m up-and-go tests.
Results: Elderly individuals experiencing fear of falling (FOF) demonstrated a markedly higher average annual falling rate compared to those without FOF, with a statistically significant difference ($p = 0.001$). Additionally, individuals with FOF exhibited significantly lower mean values in right handgrip, left handgrip, right key pinch, and left key pinch, as compared to those without FOF ($p < 0.001$ for each).
Conclusion: The assessment of upper extremity strength may serve as a predictive parameter for the fear of falls.

P1132
EFFECTIVENESS OF TELEREHABILITATION IN POSTOPERATIVE OSTEOPOROTIC HIP FRACTURES: A RANDOMIZED CONTROLLED TRIAL

R. Thongkaew[1], C. Pakpianpairoj[1]

[1]Institute of Orthopedics, Lerdsin Hospital, Dept. of Medical Services, Ministry of Public health, Bangkok, Thailand, Bangkok, Thailand

Objective: To investigate the effectiveness of telerehabilitation on mobility function, activities of daily living (ADL) and quality of life (QOL) compared to conventional rehabilitation in postoperative osteoporotic hip fractures.
Methods: This was a single center, randomized controlled trial. We recruited 90 elderly postoperative hip fracture patients and randomly assigned them to the telerehabilitation group ($n = 45$) and the conventional rehabilitation group ($n = 45$). Both groups received routine discharge instructions, and the former received remote rehabilitation based on the Internet-based protocol, while the latter received conventional rehabilitation. Time up and go test (TUG), 30-s chair stand test, Barthel index score and EQ5D5L score were used for evaluation.
Results: All outcomes measurement of the telerehabilitation group were comparable to conventional rehabilitation group but received higher overall satisfaction score and accessibility score. The timed up and go test (TUGT), 30-s chair test, Barthel index score, EQ5D5L score of both groups improved gradually with the postoperative time. At 3 months follow up the TUGT for telerehabilitation group and conventional rehabilitation group were 23.4 s and 23.7 s respectively, adjusted mean difference (-0.2, 95%CI -1.79 to 1.25, p-value 0.72).At 6 months follow up the TUGT for telerehabilitation group and conventional rehabilitation group were 14.6 s and 15 s respectively, adjusted mean difference (-0.3, 95%CI -1.45 to 0.78, p-value 0.55).
Conclusion: The internet-based postoperative hip fracture telerehabilitation protocol can improve the functional recovery of the hip joint and enhance the ability to perform activities of daily living. This could be an effective option for conducting home rehabilitation.

P1133
CHRONIC DORSAL PAIN IN SARCOPENIC FEMALES: A RANDOMIZED CLINICAL TRIAL

R. Traistaru[1], D. Kamal[2], C. Kamal[1], B. Vladutu[1]

[1]Univ. of Medicine and Pharmacy, [2]Filantropia Hospital, Craiova, Romania

Objective: Chronic dorsal pain is one of the most common symptom in sarcopenic patients leading to complex disability. Various therapeutic approaches have been proposed for chronic back pain in these patients. The aim of our study is to compare the effects of three therapeutic approaches in terms of pain, disability and self-control of the complex disorders. We take into consideration the literature data about the evidence-based primary care options for chronic back pain.
Methods: 87 patients aged between 67–82 y, diagnosed with sarcopenia were clinical (BMI), functional (time up and go—TUG, handgrip force—HG, visual analogue scale – VAS, SarQoL quality of life tool and SARC-F questionnaire) and imagistic (X-rays and sonography) evaluated. Our patients were randomized to the 3 groups in accordance to the type of treatment: group 1 (23% of patients)—only medication, group 2 (40% of patients)—medication + physiotherapy (TENS, interferential current, ultrasound), and group 3 (37% of patients) medication + aerobic and resistance training. The rehabilitation program was represented by 12 physiotherapy sessions and 18 aerobic training sessions (3 sessions/week). All assessments were performed pre-post intervention and at 6-month follow-up.
Results: All the groups showed similar decrease in pain on the third assessment and there was no significant difference between the groups. In the first and group the second there was a significant improvement in TUG values ($p < 0,05$) as well as HG ($p < 0,05$) after treatment. The third group also showed significant improvement in SarQoL value as well as TUG and HG at six month follow-up ($p < 0,01$).
Conclusion: All of the 3 therapeutic approaches were found to be effective in diminishing pain and disability in sarcopenic patients with chronic dorsal pain, but kinetic measures were found to be more effective in improving quality of life. Our results confirm the literature data—physical activity is an interesting therapy for the prevention and treatment of sarcopenia because it has no adverse side effects, it is low cost, and it confers additional benefits such as postural stability and fall prevention. Type and duration of physical training must be individualized to each patient, in accordance with severity of sarcopenia and level of disability.

P1134
ASSESSMENT AND REHABILITATION IN FRAIL OLDER PATIENTS WITH HIP FRACTURES

R. Traistaru[1], D. Kamal[2], A. M. Bumbea[1], A. Kamal[1]

[1]Univ. of Medicine and Pharmacy, [2]Filantropia Hospital, Craiova, Romania

Objective: Frail older patients have impaired physical functions. Fragility fractures in older patients trigger secondary preventive assessment, including lifestyle, non-pharmacological and pharmacological interventions. Goals of complete rehabilitation program in these patients include controlling pain, maintaining and improving the range of movement and stability of affected joints, and limiting functional impairment, for an optimal quality of life. In our

prospective study, we assessed the efficacy of rehabilitation program (TENS, laser and kinetic program, education program for regain self-esteem and optimal body image) over the global functional status. We evaluated the correlation between functional parameters (simple reaction time, walking speed), ultrasound muscle reaction in isometric contraction and quality of life (Quality of Life Questionnaire).

Methods: We studied 56 old patients (39 women, 17 men), aged between 70–81 y. All patients diagnosed with previous fragility hip fracture were clinical, functional and imagistic (X-rays, DXA and sonography) evaluated. The complex rehabilitation program (educational, dietetic, pharmacological, physical—kinetic) was performed 5 d/week, 3 weeks. All subjects were evaluated at baseline (T1) and at 2 (T2) and 3 (T3) months later.

Results: The studied parameters had improved, especially in T2 moment ($p < 0.05$). The mean values of simple reaction time, walking speed were correlated with ultrasound muscle variations in isometric contraction. Multivariate analysis showed that sonographic aspects correlated statistically with Quality of Life Questionnaire. After 3 months, improved functional status was maintained.

Conclusion: Our results reflected two aspects: 1—the favorable complex effect (clinical, functional and ultrasound) of rehabilitation performed in patients with frail older patients with fragility hip fractures; 2—ultrasound exam could orient on the muscle changes associated with sarcopenia and loss of quality of life in older patients.

P1135
POSSIBILITIES OF PROMOTING PRIMARY PREVENTION BASED ON MONITORING MATERIALS OF THE MUSCULOSKELETAL SYSTEM: FIRST EXPERIENCE

P. Novosad[1], P. Hrdý[1], R. Vrána[1]

[1]Mediekos Ambulance Ltd, Osteology Centre Zlín, Osteology Academy Zlín, o.p.s, Zlín, Czech Republic

Objective: In our view, primary prevention corresponds to the CDC definition (US centres for diseases control and prevention). It strengthens the well-being of life and thus reduces the probability of illness, disability or premature death by non-specific means. 70–75% of these diseases or death is caused by chronic diseases, which from 2022, according to the WHO, are referred to as non-communicable diseases (NCDs). They have the same causative essence, last for a long time and have a slow progression. The key risk factors for these diseases are: Physical inactivity, Unhealthy diet, Alcohol abuse, Tobacco use. Physical activity and the development of functional muscles appear to be a key element in preventing the onset and development of these diseases. It has a dominant role in the pathophysiological process of LGI (low grade inflammation). We published the principle of this problem and the verification of key data at the last four IOF congresses (2020, 2021, 2022, 2023). In the last year, we addressed the issue of how to spread these claims in the population of the Czech Republic. For the professional public, we presented our claims at a professional congress and published them in a peer-reviewed press (1). For laymen, we joined with state institutions and gave a series of lectures on this topic in public places. Since primary prevention is not a recognized work code in our country, we spent the last 6 months in intensive contacts with health insurance companies. All but one insurance company has expressed interest in cooperating with our specific program on this topic. So far, we have concluded a work contract with one of them. It is built on the financial stimulation of clients who comply with the terms of the program.

Methods: The individual elements of the program are as follows:

1. Monitoring grip strength ($M < 30$ kg, $F < 20$ kg);
2. Evaluation of habitual speed of patient according to EWGSOP ($M < 0.8$ m/s);
3. Determination of BMI;
4. Quantitative evaluation of physical body composition (determination of relative muscle index $M < 7.26$ kg/m^2; $F < 5.45$ kg/m^2);
5. Determination of activity for LGI-CRP protein high sensitivity (CRPhs < 0.4–0.6 mg/L) and IL-6 (< 7.0 ng/L). Control monitoring is offered after one year, in special cases after 6 months.
6. Recommendation of the preventive regime: This is composed of two parts:
7. Recommendation of physical activity which, according to WHO, should be 150 min/week at minimum. It is composed of two components:

- 1a Physical isometric load, i.e. exercising muscles without contraction, against weight pressure (overstimulation).
- 1b Physical longitudinal load, where the optimal span is 3–5.9 MET (Metabolic Equivalent Task). This is an optimal aerobic load.

8. Dietary regime**.** This is composed of the following parts:

- 2a Setting the basic dietary regime**.** In this context, as the basis for an individual's dietary regime, we recommend a regime very close to the Mediterranean diet.
- 2b Optimized amount of protein. The amount < 0.80 g/kg weight/a day is considered inadequate, while 0.83 g/kg weight/d is considered to be optimal (according to WHO). According to the European Society for Clinical Nutrition and Metabolism, the recommended amount for older people and a reduction dietary regime is 1.0–1.2 g/kg/weight/d. The most effective is whey protein enriched with Leucine. The optimal amount is 25–30 g of protein with one meal, enriched with 2.5–2.8 g of leucine.
- 2c Vitamin D. It is recommended to saturate the organism with vitamin D.

One of the non-communicating insurance companies, together with the representatives of general practitioners, gynaecology, and also the board of directors of the Osteological Association, came up with a program of massive primary prevention of osteoporosis using FRAX values and densitometry in these clinics. From our point of view, this solution is very problematic in terms of professional issues, but mainly in terms of cost effectiveness, as was discussed in detail at the IOF congress in 2013, at which we gave a lecture on the topic of secondary prevention (2). We continue to deal with this issue, and we are located on the Capture the Fracture world map. We wanted to verify if bone densitometry values could be used in LGI monitoring. We compared the basic values of bone densitometry and relative muscle index (kg/h^2), (marked as MI in the table). All performed on a densitometer – DXA Lunar (LS = 1.5%).

Results: Characteristics of the cohort: women n = 63, average age 73.3 (from 50–88 y).

Correlation between:

- Muscle index and age: Spearman's correlation coefficient = 0.21 p-value = 0.12
- Vertebral L-spine T-score and MI: Spearman's correlation coefficient = 0.25 p-value = 0.06
- Left hip T-score and MI: Spearman's correlation coefficient = 0.04 p-value = 0.78
- Right hip T-score and MI: Spearman's correlation coefficient = 0.39 p-value = 0.12

Conclusion: There is no correlation between relative muscle index and age, T-score of L-spine, left hip T-score and right hip T-score. Considering that we do not find any significant correlation, we must conclude that the monitoring of the relative muscle index is more effective for primary prevention as a society-wide phenomenon. The state of the muscles is the dominant entity in the development of 70–75% of chronic diseases. The muscles disability plays a significant role in the diseases development. This can sometimes be associated with osteoporosis, but osteoporosis has to be taken as one of about 40 diagnoses in terms of NCDs. Its primary prevention in the form described above is not cost effective. For osteoporosis, we would prefer secondary prevention, as we have been doing for years. From

our point of view, we have to say that the implementation of primary prevention throughout society will be much more difficult than we expected.

Acknowledgement: Very grateful to PhD. Kateřina Martinovičová for the mathematical processing of the data.

References:

1. Novosad P, et al. Remedia 2021:31:1
2. Novosad P, et al. Osteoporos Int 2013;24(Suppl1).

P1136 Standard X-ray images may potentially be used to quantify bone disorganization and identify patients with hypophosphatasia

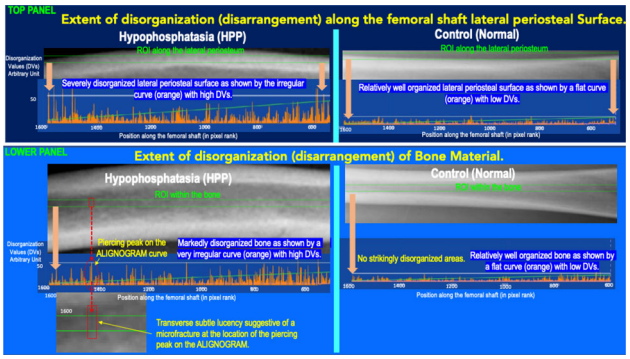
R. ZEBAZE[1], C. Shore-Lorenti[1], Z. Simon[1], K. Djopseu[2], T. Makebeh[2], F. Milat[3], R. Ebeling[1]

[1]Dept. of Medicine, School of Clinical Sciences, Monash Univ., Melbourne, Australia, [2]Zeze Co, Yaounde, Cameroon, [3]Hudson Institute of Medical Research, Melbourne, Australia

Objective: The diagnostic issue is that low BMD and structural decay (e.g., cortical or trabecular deficits) are not key features of hypophosphatasia (HPP). Hence, a critical unmet challenge is the lack of a tool to accurately identify bone fragility in patients with HPP. We proposed that the loss of function mutations in tissue non-specific alkaline phosphatase leads to an impaired ability to properly organize (arrange, align) bone. This results in disorganized, damage-prone, and fragile bone. Thus, we hypothesized that quantification of the extent of bone disorganization identifies patients with HPP.

Methods: We studied 6 adult patients with HPP and 15 age- and sex-matched controls, Mean age 48 y (IQR 23–53). The extent of disorganization and features of the most misarranged areas were assessed using a novel validated tool (ALIGNOGRAM). This tool analyses femoral X-rays using AI and novel image processing algorithms.

Results: External shape: HPP patients had markedly more disorganized contours. Their periosteal surface was threefold more disorganized than that of controls; mean disorganization values (DVs) were respectively 3.04 (IQR = 0.21–7.25) in HPP vs. 1.0 (IQR = 0.07–2.53), ($P < 0.0001$). Moreover, the pattern of disorganization of the periosteum was distinctly (threefold) more irregular (Figure, top panel). Bone material was markedly ($\sim$ threefold) more disorganized in HPP; mean DVs ($\pm$ SEM) were 3.17 1.1(IQR = 2.37–4.03) in HPP vs. 1.1(IQR = 0.83–1.14) in controls, respectively $P < 0.0001$). Noticeably, there were many random tiny areas with excessively high DVs. They allowed us to identify relatively transverse subtle bands (barely visible unless detected by the tool). These bands were either small lucent lines suggestive of micro (early-stage) fractures, or opaque lines corresponding to micro-sclerosis. No strikingly disorganized areas were detected in controls (Figure, left lower panel).



Conclusion: Abnormal bone disorganization can be quantified from readily available X-ray images as a biomarker to identify HPP patients. This may offer a path for an easy, early routine identification of HPP patients in clinical and research settings. Detection of microfractures (early stage) offers the opportunity for early intervention which may revolutionize HPP treatment. Larger studies are underway.

P1137 UREMIC TOXIN INDOXYL SULFATE INDUCES CHONDROCYTE SENESCENCE AND IRON-DEPENDENT FERROPTOSIS

S.-H. Liu[1], R.-S. Yang[1], Y.-P. Chung[1]

[1]National Taiwan Univ., Taipei, Taiwan

Objective: Indoxyl sulfate (IS) is a proteophilic urotoxic substance whose accumulation is associated with decreased renal function. Patients with kidney disease who undergo dialysis often experience symptoms, such as joint pain and osteoporosis, which may be caused by IS-induced abnormal bone metabolism and even senescence-mediated bone abnormalities. Ferroptosis is an iron-dependent cell death process, which the increased oxidative damage is believed to be closely related to senescence. Although IS may induce abnormal bone turnover or joint disease, its effects on articular chondrocytes remains unclear. Here, we investigated the effects and mechanisms of IS on human chondrocytes in vitro.

Methods: Human chondrocytes were cultured and treated with 0.1–1 mM of IS to analyze cell viability, senescence-related proteins, and senescence-associated beta-galactosidase (SA-β-gal). We also analyzed iron accumulation, antioxidant systems, and lipid peroxidation, which were key factors in ferroptosis. Deferoxamine (DFO), an iron chelator, was used to explore the role of iron or iron-dependent ferroptosis.

Results: IS at the concentrations of 0.1 and 0.3 mM, which were no apparent cytotoxicity, significantly increased the senescence-related proteins (p16, p53, and p21) and SA-β-gal activity. Furthermore, we observed an accumulation of total intracellular iron ion content, an increase in iron uptake-related proteins transferrin receptor (TFR)/divalent metal transporter-1 (DMT1), a decrease in endogenously antioxidant proteins system Xc^- (xCT)/glutathione peroxidase 4 (GPX4), and an increase in reactive oxygen species and

malondialdehyde. Finally, DFO treatment significantly reversed the key factors of ferroptosis and reduced senescence in IS-treated chondrocytes.
Conclusion: IS leads to iron-dependent cell death through TFR/DMT1 activation and subsequent iron influx in chondrocytes, as well as inhibition of the antioxidant system and induction of chondrocyte senescence. These results provide new insight and possible therapeutic direction into the effects of IS on joints.

P1138
INVESTIGATING THE CORRELATIONS BETWEEN HYPERTENSION, HYPERLIPIDEMIA, HYPERGLYCEMIA, LOW BONE DENSITY AND LOW MUSCLE MASS

K.-P. Lin[1], D.-C. Chan[1], W.-J. Huang[1], C.-J. Wen[1], T.-H. Yang[2], R.-S. Yang[3]

[1]Dept. of Geriatrics and Gerontology, National Taiwan Univ. Hospital, Taipei, [2]Dept. of Orthopedics, NTU BioMedical Park Hospital, NTUH Hsin-Chu Branch, HsinChu, [3]Dept. of Orthopedics, National Taiwan Univ. Hospital, Taipei, Taiwan

Objective: The proportion of elderly people in Taiwan reached 14% (aging society) since 2018 and is projected to 20% (super-aged society) by 2025. The most critical health issues for the elderly population include the "3 H" (hypertension, hyperlipidemia, hyperglycemia) and "2 L" (low bone density and low muscle mass). These conditions may have comorbidities or mutually influencing factors.
Methods: A total of 379 patients aged 65 and above with "3 highs", and patients aged between 20 and 64 with diabetes were enrolled. Participants will be categorized into four groups: "Robust," "Pre-sarcopenia," "Dynapenia," and "Sarcopenia". Exploratory analysis between muscle health and "3 H" as well as low bone mass were reported.
Results: The mean age for the entire cohort was 65.4 ± 14.3 y, with 49.1% female. The baseline characteristics of 4 groups were shown in the following Table.

	Robust (N=161)	Pre-sarcopenia (N=21)	Dynapenia (N=169)	Sarcopenia (N=28)	
Age	60.6±12.8	57.8±17.1	70.7±13.3	66.0±14.7	P<0.05
Weight	69.0±13.2	60.0±10.0	65.8±13.3	54.7±8.9	
Waistline	86.4±9.8	77.7±10.2	89.0±11.6	77.8±9.3	
DBP[a]	82.4±11.8	82.1±10.5	78.0±12.9	78.9±9.6	
TG[b]	126.9±70.4	102.2±59.7	128.7±59.7	111.4±69.5	
T-CHO[c]	166.2±33.1	192.5±91.8	168.8±35.5	171.7±32.9	

a. Diastolic blood pressure
b. Triglycerides
c. Total-cholesterol

Comorbidities including hypertension, cerebrovascular disease, cardiovascular diseases, kidney diseases, dyssomnia, neurodegenerative disorders, and osteoporosis showed statistically significant differences among four groups ($p < 0.05$). The BMD T-score of femoral neck and total hip were significant lower in "Dynapenia" and Sarcopenia" groups ($p < 0.05$).
Conclusion: Participants with low skeletal muscle mass were lighter and had smaller waistline and lower TG. Participants with low muscle strength or physical performance had larger waistline, lower DBP, and lower BMD.

P1139
FREQUENCY OF OSTEOPOROSIS IN A SOUTH AMERICAN MALE COHORT OF THE SIXTH DECADE

S. A. Blanco[1], J. Sanabria[1], L. A. Dulcey[1], J. A. Gomez[1], E. Y. Gutierrez[1], A. P. Lizcano[1], J. A. Garcia[1], L. C. Bacca[1], A. Suarez[1], M. S. Figueroa[1]

[1]Autonomous Univ. of Bucaramanga, Bucaramanga, Colombia

Objective: To determine the frequency of osteoporosis in men over 50 years old, as well as related risk factors found in a sample from a South American country.
Methods: An observational, cross-sectional, randomized study was conducted on 75 men over 50. During the study, it was performed medical history evaluations, physical exams, anthropometric measurements, and blood tests. Additionally, BMD of the femoral neck and lumbar spine was measured using DXA. The BMD values were expressed as mean mineral density (g/cm^2), bone mineral content (g), and percentage loss (%). Based on the T-score, it was diagnosed with osteoporosis (T-score ≤ -2.5 DS), osteopenia (T-score between -2.5 and -1.5), and normal BMD (T-score > -1.5). The FRAX tool was used to calculate the 10-y risk of osteoporotic fracture.
Results: The average age of participants was 61.15 ± 7.78 y. Based on BMD, it was found that 44% had regular BMD, 42.7% had osteopenia, and 13.3% had osteoporosis (with 60% of osteoporosis cases being lumbar). Individuals with osteopenia and osteoporosis had significantly lower weight, BMI, and waist circumference compared to those with normal BMD. The main risk factors identified were smoking, sedentary lifestyle, and alcohol consumption, with no significant differences between groups. Total testosterone and hypogonadism scores were similar between groups. As expected, BMD and T-scores of the femur and spine were lower in the osteopenia and osteoporosis groups ($p < 0.001$), and FRAX scores were higher in those groups as well ($p < 0.001$).
Conclusion: In the population under study, it was found that 13.3% of individuals had osteoporosis, and 42.7% had osteopenia. Notably, there were no significant associations observed between classic osteoporosis risk factors and the occurrence of these conditions, except for lower adiposity. Furthermore, no secondary causes were identified. These results emphasize the necessity for further research into the risk factors and underlying causes of osteoporosis in males.

P1140
DIAGNOSIS OF OSTEOPOROSIS IN A SOUTH AMERICAN COHORT IN THE POSTMENOPAUSAL PERIOD

S. A. Blanco[1], J. Sanabria[1], L. A. Dulcey[1], J. A. Gomez[1], E. Y. Gutierrez[1], A. P. Lizcano[1], J. A. Garcia[1], L. C. Bacca[1], A. Suarez[1], M. S. Figueroa[1]

[1]Autonomous Univ. of Bucaramanga, Bucaramanga, Colombia

Objective: To characterize the sample studied according to type of menopause; to evaluate BMD characteristics and prevalence of alterations; to determine dependence between age and BMD; and to identify 10-y osteoporotic fracture risk in late and surgical postmenopausal patients.
Methods: A retrospective, observational, descriptive, longitudinal study was conducted from January 2017 to December 2019. It included 1,019 postmenopausal female patients, excluding premenopausal patients, incorrectly positioned patients, whole body scans, extremity scans, and operated vertebral column scans from the original 1992 bone densitometry tests. BMD was assessed using DXA and WHO criteria. The FRAX software calculated the 10-y fracture risk. Statistical analysis contained frequencies, percentages, means,

and standard deviation. Chi-square was used for contingency tables with a significance level of 95% and $p < 0.05$.

Results: Most patients had natural menopause (86%), and the rest had post-surgical menopause (14%). Inside the natural menopause group, 8.1% had primary ovarian insufficiency, 12.4% had early menopause, 61.1% had spontaneous menopause and 4.4% had late onset. BMD was normal in 22.5%; low in 54.96%; and osteoporotic in 22.57%. In primary ovarian insufficiency, osteopenia occurred in 55.4% and osteoporosis in 19.3%; alterations peaked at ages 35–39. In early menopause, 50.8% had osteopenia, and 25.4% had osteoporosis. In spontaneous menopause, 57.1% had osteopenia, and 20.1% had osteoporosis; osteoporosis was more frequent in late menopause (31.1%) than early (25.4%) or spontaneous (20.1%) menopause. In post-surgical menopause, the high 10-year vertebral fracture risk was 60.86%, and the hip fracture risk was 6.29%; in late-onset, it was 46.66% for the vertebral column and 8.88% for the hip. A significant increase in the risk of osteoporotic fracture in the vertebral column with age was observed.

Conclusion: Low BMD is highly prevalent in postmenopausal women, especially osteopenia (54.96%). Surgical and late menopause have a 30% frequency of osteoporosis. FRAX reveals a high spine fracture risk in surgical and late menopause, eight times more common than hip fractures. Evaluation of fracture risk and BMD is recommended in menopausal women for timely prevention and treatment.

P1141
SEVERE INFLAMMATORY MYOPATHIES PATTERN

S. Abdellaoui[1], S. Lefkir-Tafiani[1]

[1]Issad Hassani Beni Messous Hospital, Algiers, Algeria

Objective: Inflammatory myopathy (IM) have experienced in recent years, in addition to adaptation of classification according to discovery of antibodies, a better physiopathological knowledge as well as a better understanding of "severe" phenotype of the disease. Objective study is to define severe myopathy pattern and thus to establish severity factors of the disease by comparing 2 populations of myositis: non-severe myositis (NSM) and severe myositis (SM).

Methods: This is a multicenter analytical descriptive study on 50 patients with myositis (20 dermatomyositis, 25 SAS, 4 NMAI and 1 IM) followed over 70 months. 2 populations of non-severe form (NSM) vs. severe form (SM) were compared prospectively according to the appearance or not of predictive signs of severity over time.

Results: Average age of SM forms was 50 y vs. 45 y NSM ($p = 0.024$) with a tendency towards a faster mode of installation in SM. Clinically, skin involvement was more frequent (machinists' hands, Raynaud's, necrosis, DM signs) in SM at 72% vs. 64% ($p = 0.12$). Muscle damage were more frequent in SM at 90 vs. 77% ($p < 0.01$). Lung involvement was found in 52 vs. 26% in NSM ($p < 0.01$) with a predominance of interstitial lung disease with basal and subpleural condensations, common pneumonia, forms of presence of a restrictive syndrome without ILD showing of a probable association of diaphragmatic damage and probably existence of HTAP. ANA was more frequently positive in SM forms 90 vs. 70% with specific antibodies MDA5 and PL7 and PL12 which dominate severe forms. During follow-up, SM forms presented 50 vs. 20% relapses ($p < 0.01$), more pleuropulmonary superinfections (35 vs. 12% $p = 0.03$), and more concomitant cancers.

Conclusion: Prospective monitoring over time of IM made it possible to identify predictive factors for severity and poorer survival: sudden onset, severity of skin/muscle and pulmonary involvement, seropositivity of myositis would be more associated with SM. This would encourage us to be more vigilant and prevent occurrence of severe phenotype further upstream.

P1142
DENSITOMETRIC GAIN UNDER ZOLEDRONATE: ILLUSION OR REALITY?

S. Abdellaoui[1], B. Bengana[1], S. Lefkir-Tafiani[1]

[1]Issad Hassani Beni Messous Hospital, Algiers, Algeria

Objective: Osteoporosis is the most common demineralizing osteopathy, its seriousness lies in increased risk of fracture which can have consequences on morbidity and mortality, particularly following cortical weakening. Several treatments have been clinical studies subject on demineralization prevention. This study is to analyze densitometric gain after treatment with zoledronate over 3 y in osteoporotic population and to identify predictive factors of better gain.

Methods: Prospective single-center study on 156 patients diagnosed with osteoporosis on BMD according to a T-score < -2.5 at the spine and/or femoral neck and treated with 3 infusions of zoledronate. A comparison of T-scores was carried out by comparing BMDs evolution (BMD1 before zoledronate initiation and BMD2 after 3 y of treatment). A rheumatological investigation including: clinical, bone densitometric, and therapeutic data (vitamin D supplementation and/or taking previous preventive treatment) was carried out. Note that no patient received another therapeutic class apart from bisphosphonates before zoledronate.

Results: We collected 156 patients (144 women vs. 12 men) with an average age of 71.33 y. BMD1 at spine found a T-score of—3.34 (0.634) and -2.21(0.567) at femoral neck vs. BMD2 found a T-score of—2.60 (0.640) at spine and -1.87(0.603) at proximal femur, i.e. a BMD gain of 2% at the spine and 1.5% at the hip. Concerning osteoporosis subgroups analyses, densitometric gain was + 3.6% at the spine vs. + 1.5% at the hip for trabecular osteoporosis, 3.8% at spine vs. + 2.1% at hip for cortical osteoporosis and + 1.8% at spine vs. + 1.2% at hip for osteoporosis at the 2 sides. Concerning of the subpopulation analyse having worsened final T-score at hip (persistence T-score low < -2.5) with a T-score at -2.9 and 0.524 mg/cm^2 of BMD at 3 y. It is made up of 27 patients (including 12, 2 and 10 trabecular, cortical and mixed osteoporosis) which increases the incidence of fractures with 22 incident fractures recorded (75% vertebral fractures). Therefore, this population should be monitored closely and either a change in therapeutic class, or addition of 3 other infusions of zoledronate or a therapeutic holiday should be proposed. Age over 65 y, female gender, history of taking alendronate, vitamin D supplementation were found to be predictive of a better densitometric gain with non-significant difference.

Conclusion: Most patients showed a gain in BMD over 3 y; vitamin D supplementation, female gender, taking previous preventive treatment and age > 65 y seemed to be predictive of a better gain. Analysis of the reduction in fracture risk would also be interesting to research in this population.

P1143
15-PROSTAGLANDIN DEHYDROGENASE EXPRESSION AND FUNCTION IN CARTILAGE TISSUE

S. Alsabri[1], M. Najar[1], M. Benderdour[2], J.-P. Pelletier[1], J. Martel-Pelletier[1], H. Fahmi[1]

[1]Osteoarthritis Research Unit Centre de Recherche du Centre Hospitalier de l'Université de Montréal (CRCHUM), [2]Orthopedics Research Laboratory, Research Center, Hôpital du Sacré-Cœur de Montréal, Université de Montréal, Montreal, Canada

Objective: Osteoarthritis (OA), is the most common form of joint disorder. It is differentiated by synovitis (synovial membrane inflammation), progressive cartilage degradation, subchondral bone remodeling, and discomfort. 15-hydroxyprostaglandin dehydrogenase (15-PGDH) is responsible for the catabolism of PGE2, which has been implicated in the regulation of inflammation and cartilage biology. The purpose of this study was to look at the expression and function of 15-PGDH in cartilage tissue.
Methods: Real-time reverse transcriptase-polymerase chain reaction (RT-PCR), immunoblotting, and immunohistochemistry were used to examine the expression of 15-PGDH mRNA and protein in cartilage. IL-1 was used to activate chondrocytes. Real-time RT-PCR and western blotting were used to assess the expression of 15-PGDH, and the impact of 15-PGDH activity in the expression of important inflammatory genes was investigated using 18-Glycyrrhetinic Acid, an inhibitor of 15-PGDH.
Results: Low levels of 15-PGDH in OA tissues show that the disease may arise as a result of decreasing amounts of the protein, which is expressed in both human and mouse cartilage. In human OA chondrocytes, IL-1β treatment downregulated the mRNA and protein expression of 15-PGDH. Additionally, we demonstrated that treatment with 18 βGA, an inhibitor of 15-PGDH activity, upregulated the expression of important inflammatory genes in cartilage, such as iNOS, COX-2, and mPGES-1, and downregulated the expression of the primary anabolic genes, type II collagen and aggrecan.
Conclusion: All of these findings point to the role of 15-PGDH in the etiology of OA. Additionally, they propose that focusing on 15-PGDH expression and/or activity might represent a unique anti-OA treatment that involves precise PGE2 level regulation.

P1144
ROLE OF EPIGENETIC REGULATION AND SP1 TRANSCRIPTION FACTOR ON DP1 RECEPTOR EXPRESSION IN OSTEOARTHRITIS

S. Alsabri[1], H. Fahmi[1]

[1]Osteoarthritis Research Unit Centre de Recherche du Centre Hospitalier de l'Université de Montréal (CRCHUM), Montreal, Canada

Objective: Osteoarthritis (OA) is the most common form of musculoskeletal disease and a major cause of long-term disability with a significant socioeconomic impact. The primary clinical signs of OA include joint pain, stiffness, and a restricted range of motion. Age, obesity, joint damage, poor knee alignment, and genetics are identified as risk factors for OA, and the main pathological characteristics of OA include the cartilage progressive degeneration, synovium inflammation, and subchondral bone sclerosis. The prostaglandin D2 receptor, D prostanoid receptor 1 (DP1), is essential for modulating inflammation and cartilage metabolism. Our previous findings demonstrated that DP1 signalling is protective against OA in mice and downregulates catabolic responses in cultured chondrocytes. Nonetheless, little is known about the DP1 transcriptional regulation mechanisms in cartilage. The aim of this study was to characterize the human DP1 promoter and investigate how DNA methylation affects DP1 expression in chondrocytes. Furthermore, we assessed the methylation state and expression level of the DP1 gene promoter in both normal and OA cartilage.
Methods: A minimal promoter region (-250/-120) containing three binding sites for specificity protein 1 (Sp1) was identified by deletion and site-directed mutagenesis analyses. Electrophoretic mobility shift assays (EMSA) and chromatin immunoprecipitation (ChIP) were used to confirm the binding of Sp1 to the DP1 promoter.
Results: Both DP1 mRNA expression and DP1 promoter activity were reduced by treatment with the Sp1 inhibitor mithramycin A. Treatment with DNA methylation inhibitor, 5-Aza-2'-deoxycytidine, upregulated DP1 expression, and the DP1 promoter activity was reduced in the in vitro methylation. There was no difference in the methylation status of the DP1 promoter or the level of DP1 expression between normal and OA cartilage.
Conclusion: Our findings suggest that DNA methylation and the transcription factor Sp1 are important determinants of DP1 transcription regulation. Furthermore, they suggest that OA cartilage does not exhibit changes in the methylation status or expression level of DP1. These results will advance our knowledge of the DP1 transcription regulatory mechanisms and could help design DP1-related intervention tactics.

P1145
ROLE OF DNA METHYLATION ON 15-LIPOXYGENASE-1 GENE EXPRESSION IN OSTEOARTHRITIS

S. Alsabri[1], H. Fahmi[1]

[1]Osteoarthritis Research Unit Centre de Recherche du Centre Hospitalier de l'Université de Montréal (CRCHUM), Montreal, Canada

Objective: Osteoarthritis (OA) is the most prevalent type of arthritis and a major contributor to physical impairment with a significant financial impact. OA. Pain, stiffness, and a restricted range of motion are the primary signs and symptoms of OA. Genetics, age, obesity, joint damage, and knee malalignment are risk factors for OA. Numerous anti-inflammatory and immunomodulatory lipid mediators are produced by 15-lipoxygenase-1 (15-LOX-1), which has been shown to have protective effects against a number of inflammatory diseases, including OA. The purpose of this study was to assess the expression of 15-LOX-1 in the cartilage of OA patients and normal donors, as well as to ascertain whether DNA methylation controls this expression.
Methods: Cartilage samples were collected from both OA-affected at the time of total knee replacement surgery, and normal knee joints during autopsy. Real-time polymerase chain reaction (PCR) was used to assess the expression of 15-LOX-1. Using 5-Aza-2'-desoxycytidine (5-Aza-dC), a DNA methyltransferase inhibitor, the significance of DNA methylation in 15-LOX-1 expression was evaluated. Using a CpG-free luciferase vector, the impact of CpG methylation on the activity of the 15-LOX-1 promoter was assessed. Pyrosequencing was used to ascertain the 15-LOX-1 promoter's DNA methylation status.
Results: Compared to healthy cartilage, OA showed increased expression of 15-LOX-1. 15-LOX-1 mRNA levels were upregulated in chondrocytes treated with 5-Aza-dc, and 15-LOX-1 promoter activity was downregulated in vitro through methylation. The methylation status of the 15-LOX-1 gene promoter did not differ between cartilage from normal and OA cartilage.
Conclusion: In OA cartilage, there was an increased expression level of 15-LOX-1, which might be related to a healing process. The methylation status of 15-LOX-1's promoter was not linked to its upregulation in OA cartilage, indicating that alternative mechanisms may be at play.

P1146
UTILITY OF EDUCATIONAL VIDEO IN IMPROVING AWARENESS OF BONE HEALTH IN PRE-SCHOOLS AND PRIMARY SCHOOL AGED CHILDREN AND EDUCATORS IN SINGAPORE

L. Gani[1], E. Chen[2], J. Pang[3], S. Kamas[4], C. Low[4], S. B. Ang[5], S. B. Chionh[6]

[1]Changi General Hospital, [2]Kandang Kerbau Women's and Children's Hospital, [3]National Univ. Hospital, [4]Health Promotion Board, [5]Kandang Kerbau Women's and Children's Hospital, [6]National Univ. Hospital, Singapore, Singapore

Objective: The foundation of skeletal health begins as early as in utero with majority of bone mass gained in childhood and adolescence. It is estimated that a 10% increase in peak bone mass would delay the onset of osteoporosis by 13 years in women 1–4. Thus, optimizing factors that would help in achieving peak bone mass would assist in the primary prevention of osteoporosis. In this study, we piloted an educational video in the preschool and primary school population to assess its effectiveness in increasing awareness of bone health and activity.
Methods: A team of doctors, dietician and physiotherapist worked together to create an educational video to increase awareness of bone health. Major theme incorporated included 1. The importance of strong bones and growth of bones in children; 2. The role of adequate calcium in healthy diet; 3. The importance of exercise in bone health. The educational video was piloted in Singapore from June to September 2022. The video was created in animated format to allow greater appeal to younger children. Teacher's activities deck along with suggestions of learning points are also shared with the various schools and pre-school institutions. The work was conducted with the collaboration of the Health Promotion Board (HPB), Singapore. Feedback on the educational video are also collected at the end of the pilot period.
Results: Over a period of 3 months, publicity was conducted in 1800 preschools and 170 primary schools. Feedbacks were received from 10 primary schools and 24 pre-school centres. The educational video was also hosted on YouTube and received over 1800 views. Over 5000 students were reached based on the feedback given by the schools. The feedback found that 88% of the users found the resources were useful with age appropriate content. There was very high level of satisfaction with 91% stating satisfaction level scale of 4–5. Majority of feedback was obtained from the kindergarten 1 and 2 and primary levels 1–4. 77% found that the resources were easy to use.
Conclusion: An animated educational health video with appealing design and simple contents is an easily administered tool and effective in increasing awareness of bone health. Hosting the video on you tube also allowed greater outreach to those beyond the schools. Further follow up is needed to ascertain the effectiveness of this educational tool in changing overall health behaviours and its long-term impact on bone health in Singapore.

P1147
SPONTANEOUS AND INDUCED MONOCYTE EXTRACELLULAR TRAPS FORMATION IN OSTEOARTHRITIS PATIENTS

S. Bedina[1], E. Mozgovaya[2], S. Spitsina[3], E. Zagorodneva[4], N. Krayushkina[4], A. Trofimenko[2], M. Mamus[2]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky; Volgograd State Medical Univ., [2]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, [3]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky; Volgograd State Medical Univ., [4]Volgograd State Medical Univ., Volgograd, Russia

Objective: Evaluation of peripheral blood monocytes' ability to generate ET spontaneously and after induction in vitro in osteoarthritis (OA).
Methods: The research was carried out in agreement with the WMA Declaration of Helsinki principles. Monocytes were purified with centrifugation procedure using originally designed iohexol density gradients [1, 2]. The cell types in the resulting fractions were identified histochemically, and the extent of cell activation was assessed using common nitro-blue tetrazolium test. Generation of ETs was stimulated by phorbol-12-myristate-13-acetate (PMA). The shape and size of ETs were assessed using fluorescence microscopy with SYBR green [3].
Results: 23 patients with verified OA (6 males and 17 females, mean age 5.4 y, mean disease duration 12.5 y). 30 healthy volunteers were enrolled as a reference group. OA patients were in clinical remission at the inclusion timepoint. Indicators of the yield of isolated cells, purity of cell fractions, viability and nonspecific activation of monocytes in the control group were comparable to those of the same name in healthy individuals. Mean contamination of the monocytic fraction both in the reference group and in the OA patients in did not exceeded 4%. Spontaneous and induced ET formation by isolated monocytes in patients with OA during exacerbation is significantly higher than in OA in remission and in the reference group ($p < 0.05$). The growth rate of spontaneous ET formation was 89.9%, induced ET formation—39.2%. The growth rate of spontaneous NET formation is 2.3 times higher than the induced ET formation.
Conclusion: We have revealed enhanced spontaneous and induced ET formation by monocytes from OA patients, suggesting that circulating monocytes may be primed to ETosis through immune inflammation.
References:

Bedina S, et al. Med Immunol 2022;24:1249
Bedina S, et al. Siberian Med Rev 2022;138:86
Bedina S, et al. Med Immunol 2021;23:1165

P1148
FEATURES OF NETS FORMATION IN RHEUMATOID ARTHRITIS PATIENTS

S. Bedina[1], E. Mozgovaya[2], S. Spitsina[3], A. Trofimenko[2], I. Shushkova[4], V. Pavlovskaya[4], M. Mamus.[2]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky; Volgograd State Medical Univ., [2]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, [3]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky; Volgograd State Medical Univ., [4]Volgograd State Medical Univ., Volgograd, Russia

Methods: 39 RA patients made up the main group, 33 healthy individuals—the control group. Circulating neutrophils were isolated with one-step density gradient centrifugation using double layers of iohexol gradient [1, 2]. The cell types in the resulting fractions were identified histochemically, and the extent of cell activation was assessed using common nitro-blue tetrazolium test. NETs were induced by phorbol-12-myristate-13–acetate (PMA). NETs were visualized by fluorescence microscopy [3].
Results: RA disease activity at the inclusion timepoint shouldn't exceed 2.6 DAS28 points. In 17 RA patients, an increase in DAS28 > 3.2 points exacerbation was diagnosed during the study. The mean percentage of spontaneous and induced NETs was 3.8

(2.6–5.0) and 12.2 (9.0–15.4)% in the reference group, respectively; 5.9 (5.6–6.2) and 26 (23.9–28.1)% of inactive RA patients, 16.6 (16.1–17.1) and 38.0 (36.6- 39.4)% of active RA patients, respectively. Increase in spontaneous NETs during RA activation—181.4%, induced—46.2%. Analysis of the main components of NETs in Ra patients revealed MPO, histone H3 and citrullinated epitopes. Citrulline epitopes were found in 88% of RA patients.

Conclusion: The transition of RA from a state of remission to active inflammation is accompanied by a significant increase in NETs formation, especially spontaneous. The predominance of citrullinated epitopes in NETs demonstrates their influence on the induction and maintenance of an autoimmune response to RA-specific autoantigens.

References:

1. Bedina S, et al. Med Immunol 2022;24:1249
2. Bedina S, et al. Siberian Med Rev 2022;138:86
3. Bedina S, et al. Med Immunol 2021;23:1165

P1149
CHONDROITIN SULFATE CONJUGATED SOLID LIPID NANOPARTICLES FOR TREATMENT OF OSTEOARTHRITIS

S. Bhargava[1], M. Bhargava[2]

[1]Signa College of pharmacy, [2]GTB Hospital, Kanpur, India

Osteoarthritis (OA) is also known as degenerative joint disease and it is characterized by degradation of joints, including articular cartilage and subchondral bone. OA commonly affects the hands, feet, spine and the large weight bearing joints such as the hips and knees.

Intra-articular drug delivery belonging to the symptom-modifying osteoarthritis drug family is compromised by the presence of a highly efficient lymphatic system that rapidly eliminates molecules from the synovial cavity, frequent dosing, adverse side effects and patient discomfort in the management of OA.

This research work reports the development and characterization of aceclofenac loaded chondroitin sulfate (CS) conjugated (CS-SLN) and unconjugated solid lipid nanoparticles (SLN) for the effective management of OA.

The SLNs were prepared using modified solvent injection method and then conjugated with CS using carbodiimide chemistry which was confirmed using IR and NMR spectroscopy. They were further characterized for surface charge, size and size distribution, zeta potential, particle shape and surface morphology by transmission and scanning electron microscopy, %entrapment efficiency and in vitro drug release profile. Anti-inflammatory activity and in vivo studies were performed which included estimation of drug in serum and various organs.

The particle size of the SLN and CS-SLN was found to be 143.4 ± 0.9 nm and 154.2 ± 1.1 nm, respectively. SLNs exhibited sustained drug release in-vitro for > 24 h. In vivo performance studies revealed the highest uptake of SLNs by the knee joint. Plain drug solution inhibited MIA-induced edema effectively upto 4 h, SLN upto 8 h and CS-SLN upto 12 h due to sustained release behavior. These results provide evidence for the site-specific targeting of the therapy to the site of inflammation.

SLNs enhanced accumulation at the knee joint due to specific interactions with CD44, annexin and leptin receptors attributed to CS coupling. CS-SLN could be potentially effective vector for the treatment or management of OA.

P1150
SOLID LIPID NANOPARTICLES FOR EFFECTIVE MANAGEMENT OF PSORIASIS

S. Bhargava[1], M. Bhargava[2]

[1]Signa College of pharmacy, [2]GTB Hospital, Kanpur, India

Psoriasis is characterized as chronic, recurring, genetically determined, immune-mediated inflammatory skin disease characterised by scaly patches due to excessive skin production. Skin rapidly accumulates at the site of onset and takes a silvery white appearance which erodes with excessive itching. To design and develop novel particulate carrier loaded with antipsoriatic drug (dithranol) for safe, efficient and constant delivery for radical cure of psoriatic plague. Solid lipid nanoparticles (SLN) have emerged as an alternative to liposomes due to various advantages such as improved physical stability, low cost compared to phospholipids and ease of scale-up and manufacturing.

Solid lipid nanoparticles are special lipid aggregates that can penetrate efficiently and retain in to the skin. The SLN were prepared by solvent injection method. Drug loaded SLN's were characterized in vitro for their shape, size, percent antigen entrapment and stability. The mean particle size was determined by photon correlation spectroscopy (PCS) using a Malvern Zetasizer. Scanning electron microscopy and transmission electron microscopy was performed.

The amount of entrapped antigen was determined after removal of unentrapped antigen. Recovered fractions were challenged with triton X-100 (0.2%, v/v) and amount of drug was determined using BCA method. In vivo studies constituted of quantitative estimation of drugs in different skin layers by Tape stripping method, Skin irritation studies by Draize patch test and fluorescence microscopy was carried out to confirm the uptake of SLNs. SLNs formed were multilamellar and were found to be stable in gastric and intestinal fluids.

Fluorescence microscopy suggested that SLNs were taken up by gut associated lymphoid tissues. Encapsulation of dithranol in SLN resulted in dramatic improvement in its stability. SLN based gel resulted in remarkably less erythematic episodes as compared to plain drug based gel. Enhanced accumulation of dithranol via SLN within the skin might help to optimize targeting of this drug to the epidermal and dermal sites.

P1151
VARIATIONS OF MUSCULOSKELETAL PAIN IN CONTEXT OF INFLAMMATORY JOINT DESEASES OR COVID-19 PATIENTS

S. Bogdanova-Petrova[1], T. Shivacheva[1], S. Dimitrov[1], R. Moraliyska[2], S. Hristova[2], G. Gerganov[2], Z. Apostolova[1], M. Markov[2], T. Georgiev[1]

[1]Medical Univ. Varna, First Dept. of internal diseases, [2]Medical Univ. Varna, Varna, Bulgaria

Objective: To assess the intensity of arthralgia and myalgia and its correlation with inflammatory biomarkers and anxiety and depressive mood disorders. The study group is a Bulgarian cohort of patients with chronic inflammatory joint diseases (IJD) or patients with COVID-19.

Methods: A single-center, observational study including two cohorts – patients with IJD (RA, AS and PsA), observed in the Rheumatology clinic, "St. Marina" UMBAL – Varna and patients with moderate or severe COVID-19 hospitalized at the COVID-19 rheumatology department. First cohort were patients with chronic, and the second

cohort were patients with acute musculoskeletal pain onset. We used visual analogue scales (VAS) to assess pain intensity for muscular and joint pain and Zung self-report scales for depression (SDS) and anxiety (SAS). Inflammatory markers were investigated in all patients. Descriptive statistics, one-sample T test, correlation and linear regression analyses were used. A significance level of $p < 0.01$ was accepted.

Results: The total participants number included in the study was 364 patients -130 with IJD and 234 with COVID-19 (35.7 vs. 64.3%). Evaluating the VAS for assessing joint and muscle pain according to gender, we found that women with COVID-19 experience more pain—both joint and muscle, but no significant differences between men and women were found in the cohort with IJD. Women scored higher on the anxiety and depression scales in both cohort patients, and the difference was again significant. Patients with COVID-19 had higher depression and anxiety rates than patients with IJD which correlated with age and gender. Depression and anxiety determine half of the variation of musculoskeletal pain in patients with COVID and far less for patients with IJD. On the other hand, inflammatory indicators (predictors) determine about 8% of the variation of the two pain indicators in patients with IJD and much less in COVID-19 population.

Conclusion: Musculoskeletal pain is one of the most common clinical presentations in large variety of diseases. The intensity of the pain correlates more with anxiety and depressive symptoms compared to inflammatory markers in this cohort of patients.

P1152
LOW BACK PAIN IN REMOTE WORK ENVIRONMENTS IN TUNISIA

S. Bouden[1], S. Mhamdi[1], S. Loukil[1], L. Rouached[1], A. Ben Tekaya[1], I. Mahmoud[1], R. Tekaya[1], O. Saidane[1], L. Abdelmoula[1]

[1]Rheumatology Dept., Charles Nicolle Hospital, Tunis, Tunisia

Objective: To estimate the prevalence of low back pain (LBP) in remote workers in Tunisia, and to identify the main contributing factors.

Methods: We conducted a cross-sectional study that included individuals who voluntarily responded to an online survey. Participants responded anonymously to a self-administered questionnaire on musculoskeletal disorders during remote working (RW).

Results: 112 individuals were included. Among them, 57 were women and 55 were men. The average age was 33.5 ± 8.8 y. The average BMI was 24.8 ± 3.3 kg/m^2. Our participants have been performing in RW for an average of 15.1 ± 5.5 months. Twenty-four percent (n = 27) received training on ergonomic measures, and 21 individuals among them applied these measures. The average daily working hours were 7.2 ± 2.4. It should be noted that 46.4% (n = 52) reported working more than 10 h/d at least once a week. The average number and duration of breaks per day were 4 ± 2 breaks and 79 ± 50 min respectively. The average stress level on a scale of 10 was 5.6 ± 2.4. 34% of participants (n = 38) had a physical activity, with an average duration of 3.8 ± 2.6 h/week. LBP was present in 56.3% (n = 63) of respondents. A positive association was observed between LBP and the age ($p = 0.02$), the number of hours of RW per day ($p = 0.02$), and the number of days of RW per week ($p = 0.019$). LBP was also significantly more frequent among workers who work more than 10 h/d at least once a week ($p < 0.001$).

Conclusion: LBP in remote workers appears to be influenced by the workload in terms of hours and days. Measures to alleviate these factors are therefore required.

P1153
MUSCULOSKELETAL DISORDERS DURING TELEWORKING

S. Bouden[1], S. Loukil[1], S. Mhamdi[1], L. Rouached[1], A. Ben Tekaya[1], I. Mahmoud[1], R. Tekaya[1], O. Saidane[1], L. Abdelmoula[1]

[1]Rheumatology Dept. Charles Nicolles Hospital, Tunis, Tunisia

Objective: To assess prevalence of musculoskeletal disorders (MSDs) in teleworking employees and to identify the factors that may contribute to the onset or aggravation of these disorders.

Methods: We conducted an online survey involving individuals engaged in teleworking, a self-administered structured questionnaire developed through Google Forms was used to gather the necessary information. The prevalence of MSDs was assessed using the Nordic Questionnaire.

Results: A total of 112 employees (57 women (51%) and 55 men (41%)) were included in the study. The mean age was 34 y [21–60]. The mean duration of employment was 7 y [1–30] within their respective companies and 15 months [1–48] during teleworking. 22% of the workers were smokers. The mean BMI was 24 kg/m^2 [19–37]. 43% were engaged in physical exercise concurrently with teleworking. The mean working hours per day was 7 h [2–12]. 72 respondents (64%) reported not receiving any basic training on telecommuting regarding ergonomics and safety measures to set up their workspace. 52% were not satisfied with the home working environment. MSDs during teleworking were distributed as follow: neck (69%), back pain (56.3%), shoulders (53%), wrists and hands (38%). Factors that were significantly associated with elevated prevalence of MSDs were: long working hours ($p = 0.04$), extended period of telecommuting ($p = 0.02$), increase in stress level ($p = 0.04$) and low levels of satisfaction with the home workspace ($p = 0.02$).

Conclusion: Our study revealed a notable increase in self-reported MSDs among teleworking employees. Recognizing the factors is essential to design a prevention, through a holistic approach that includes ergonomic education, mental health support, and the creation of comfortable and conducive home workspaces.

P1154
JUVENILE IDIOPATHIC ARTHRITIS: CORRELATION BETWEEN DISEASE ACTIVITY AND BODY MASS INDEX

S. Bouzid[1], L. Kharrat[1], W. Lahmar[1], H. Ferjani[1], F. Majdoub[1], D. Ben Nessib[1], D. Kaffel[1], K. Maatallah[1], W. Hamdi[1]

[1]Dept. of Rheumatology, Mohamed Kassab Institute of Orthopedics, La Manouba, Tunisia

Objective: Juvenile idiopathic arthritis (JIA) is the most frequent rheumatic disease in children [1]. Delayed growth and nutritional deficiency are the most reported long-term complications of JIA [2]. This study aimed to investigate the relationship between BMI and disease activity in patients with JIA.

Methods: We conducted a retrospective study, including children with JIA meeting the ILAR 2010 criteria. For each patient, we collected the following data: age, JIA subtype, disease duration, extra-articular manifestations (EAM), ESR, and CRP level. Disease activity was assessed using the JADAS-10-ESR for all JIA subtypes and the JSpDA for related-enthesitis arthritis (ERA) and psoriatic arthritis subtypes. Age- and sex-specific BMI percentiles were calculated based on WHO growth standard charts and categorized into underweight ($P < 3$), normal weight ($3 \leq P \leq 85$), overweight ($85 < P \leq 97$) and obesity ($P > 97$).

Results: In total, 46 children were included, with a mean age of 13.34 ± 4.23 y. The male-to-female ratio was 1.42 (27/19). The mean age at the disease onset was 9.54 ± 3.91 y. The mean disease

duration of JIA was 4.04 ± 3.7 y. The JIA subtypes recorded were as follows: ERA in 52% (n = 24), oligoarticular in 15% (n = 7), polyarticular in 11% (n = 5), psoriatic arthritis in 10% (n = 4), undifferentiated in 6% (n = 3), and systemic-onset in 6% (n = 3). EAM were present in 5 patients (psoriasis (n = 1), uveitis (n = 4)). The mean JADAS-10-ESR and JSpDA were 9.21 ± 5.47 and 3.26 ± 1.65, respectively. The mean ESR and CRP levels were 31.08 ± 23.42 mm/h and 21.5 ± 28.65 mg/L, respectively. The mean weight was 44.70 ± 16.66 kg [13–77]. The mean BMI was 20.02 ± 4.89 kg/m^2 [13.75–31.2]. Underweight, normal weight, overweight, and obesity were noted in 13% (n = 6), 41% (n = 19), 17% (n = 8), and 28% (n = 13), respectively. The weight was negatively correlated with JSpDA (r = -0.469, p = 0.012). The BMI was significantly correlated with both CRP (r = -0.29, p = 0.05) and JSpDA (r = -0.423, p = 0.025). Underweight patients had significantly higher levels of JSpDA compared to patients with normal weight, overweight and obesity (p = 0.021). Patients without EAM had lower BMI (20.59 ± 4.89 vs. 16.09 ± 2.94, p = 0.038).

Conclusion: Our study showed that underweight patients had more severe disease features. Authors suggested that active disease seems to affect the child's appetite leading to cachexia [3]. Other studies are needed to confirm these results.

References:

1. Kahn P. Bull NYU Hosp Joint Dis 2012;70:152
2. Diaz-Cordovés Rego G, et al. Clin Med 2021;10:3949
3. Neto A, et al. Acta Reumatol Port 2021;46:7

P1155
NIGHT WORK AND RISK OF CHRONIC WIDESPREAD PAIN AMONG OLDER WORKERS IN THE UK

S. D'Angelo[1], G. Bevilacqua[1], G. Ntani[1], E. Dennison[1], K. Walker-Bone[2], N. Fuggle[1]

[1]MRC-Lifecourse Epidemiology Centre, Southampton, UK, [2]Monash Centre for Occupational and Environmental Health, Monash Univ., Melbourne, Australia

Objective: Chronic widespread pain (CWP) is prevalent and often leads to disability and incapacity for work. Night work has been linked with adverse health outcomes including CWP. The effect of night work on CWP is likely due to disrupting sleep patterns often observed among night workers, however, evidence is scarce. Therefore, we aimed to describe the association between night work and CWP and explore whether this is explained by sleep problems in a population sample of UK older workers.

Methods: We used data from the Health and Employment After Fifty (HEAF) study, a cohort of men and women recruited from GP surgeries in 2013–14, when aged 50–64. Information on health, finances, lifestyle, and employment was collected annually over 5 years. Job characteristics included whether the job involved working at night (sometimes/often vs. rarely/never) and the level of physical work demands. Sleep problems were self-reported. CWP was defined according to the American College of Rheumatology criteria and was available from follow-up 2. Associations between frequency of night work at baseline and subsequent CWP were explored with multilevel Poisson regression with robust standard error before and after adjustment for sleep problems, lifestyle, socio-economic factors, depression self-rated health, and physical work demands.

Results: In total 4822 participants (52% women) working at baseline, were included in the analyses with a mean (SD) age 57.5 (4.1) y. At baseline, 11% reported at least some night work. Prevalence of CWP at 2 y of follow-up was 10% (13% among baseline night workers) and only varied minimally over follow-up. Sometimes/often working at night was associated with increased risk of CWP (IRR = 1.36; 95%CI:1.14–1.61). The association was attenuated but remained robust after adjustment for sleep problems and other confounders (IRR = 1.20; 95%CI:1.00 to 1.44).

Conclusion: Amongst older workers, night work increased risk of CWP which was independent of sleep problems and other confounders like socio-economic status, and the physical demands of the job. Understanding the mechanism connecting night working and CWP is crucial to reducing musculoskeletal pain in the workplace and supporting prolonged working lives for older individuals.

P1156
IMPACT OF LOW MUSCLE MASS ON CALCULATED URINE CALCIUM INDICES

S. A. P. Chubb[1], S. D. Vasikaran[1]

[1]PathWest-FSH, Murdoch, Australia

Objective: Calcium excretion in fasting spot urine is reported as calculated indices that are thought to reflect metabolism and renal handling of calcium. Spot urine calcium to creatinine ratio is reported to correct for hydration status (Ca/Cr). The "calcium excretion" (CaE) is further corrected for glomerular filtration and is useful for screening for familial hypocalciuric hypercalcaemia. After noting high Ca/Cr in 4 patients with severe muscle wasting conditions and low serum creatinine results, we sought to examine the impact of muscle mass (using serum creatinine as surrogate) on urine creatinine concentration and urine Ca/Cr as well as CaE.

Methods: Urine calcium indices were calculated in a series of cases with normal renal function and severe muscle wasting and in 690 consecutive female patients over 50 y of age with estimated glomerular filtration rate > 60 mL/min/1.73m^2 after exclusion of those with PTH below normal or above twice normal. Relationships between urine Ca/Cr and CaE with quintiles of serum creatinine were studied by Kruskal–Wallis test. P-values < 0.05 were considered significant. Statistics were performed on MedCalc, version 22.017.

Results: The 4 patients with muscle wasting had low serum creatinine between 16–30 μmol/L and high Ca/Cr of 0.86–4.77 (mol/mol). Among the patients with normal muscle mass and renal function, urine and serum creatinine concentrations were significantly associated (p = 0.042). Ca/Cr ranged from 0.02–1.54. There were significant differences in Ca/Cr between quintiles of serum creatinine (p < 0.001). The median Ca/Cr in serum creatinine quintile 1 was significantly higher than that in quintiles 3,4 and 5 (p < 0.05). The range of CaE was 1.2–104 mmol/L. There were no significant differences in CaE between quintiles of serum creatinine (p = 0.057) although the test for trend across groups was significant (p = 0.014).

Conclusion: A low serum creatinine (< 61 μmol/L in our study) is associated with low urine creatinine excretion, and may lead to a significant increase in calculated Ca/Cr and to a lesser extent, in CaE. This may have contributed to the high Ca/Cr seen in our patients with muscle wasting. Calculated urine calcium indices should be treated with caution in patients with very low muscle mass.

P1157
TEMPORAL PATTERN AND RISK FACTORS FOR POST-STROKE OSTEOPOROSIS: A MULTICENTER STUDY 2014–2023

H. Y. Lee[1], S. D. Yoo[2]

[1]Seoul National Univ. Hospital, Dept. of Rehabilitation Medicine, National Traffic Injury Rehabilitation Hospital, Dept. of Rehabilitation Medicine, Seoul, [2]Kyung Hee Univ. Hospital at Gangdong, Dept. of Physical Medicine and Rehabilitation, Kyung

Hee Univ., Dept. of Medicine (AgeTech-Service Convergence Major), Seoul, South Korea

Objective: Stroke can lead to bone loss and a higher risk of fractures, which significantly impact the health and survival of stroke survivors. Hence, early screening and proactive management of bone health should be prioritized during stroke rehabilitation. The aim of this study was to identify determinants associated with the occurrence of osteoporosis in individuals with hemiplegic stroke, with particular emphasis on exploring temporal pattern and potential effects of functional impairments in the development of osteoporosis.
Methods: This retrospective study analyzed a cohort of 758 stroke patients sourced from two distinct centers and regions within Korea. To identify risk factors associated with osteoporosis, baseline demographic characteristics and clinical parameters of stroke (i.e. muscle strength and spasticity of hemiplegic lower extremity, ambulatory level, balance, cognitive function, initial NIHSS and mRS score) were systematically collected. BMD was measured at lumbar spine, femoral neck and total hip by DXA. Binary logistic regression analysis was used to assess the prognostic implications of osteoporosis according to acute, subacute, and chronic stages following stroke.
Results: Among the patients, 295 (38.9%) were identified as having osteoporosis. Significantly higher prevalence of osteoporosis was observed during the chronic stage compared to the acute and subacute stages, respectively. The binary regression analyses revealed that female sex emerged as a significant risk factor for osteoporosis during the acute stage (OR 39.05, 95%CI 5.01–304.53, $P < 0.001$). However, the association gradually weakened over time following stroke, with a still significant association during the subacute stage (OR 10.00, 95%CI 4.29–23.34, $P < 0.001$) and a further diminished but still significant association during the chronic stage (OR 4.11, 95%CI 1.39–12.18, $P < 0.05$). Risk factors associated with post-stroke disability showed significant associations exclusively during the subacute stage. Specifically, the presence of spasticity in the hemiplegic lower extremity was identified as a protective factor (OR 0.41, 95%CI 0.19–0.91, $P < 0.05$), while severe cognitive impairment (K-MMSE score < 17) (OR 3.16, 95%CI 1.27–7.84, $P < 0.05$) and moderate to severe disability of mRS > 2 (OR 3.76, 95%CI 1.44–9.62, $P < 0.05$) were primary risk factors of osteoporosis.
Conclusion: After 6 months following a stroke, there is a significant increase in the incidence of osteoporosis, making early screening and proactive intervention crucial during the acute and subacute phases of stroke. Particularly within the 1–6 month period after stroke onset, severe cognitive impairment and disability elevate the risk of osteoporosis. Therefore, proactive rehabilitation intervention for cognitive and physical impairment is necessary for the prevention of post-stroke osteoporosis.

P1158
DECREASE IN BONE MASS IN PATIENTS WITH EARLY AXIAL SPONDYLARTHRITIS

S. Dahmani[1], O. V. Sharapova[2], L. I. Gerasimova[2], N. V. Zhuravleva[3], T. L. Smirnova[3], V. N. Diomidova[3]

[1] "Rahmani" Pharmacy, Casablanca, Morocco, [2]Russian Biotechnological Univ., Moscow, Russia, [3]Chuvash State Univ. named after I. N. Ulyanov, Cheboksary, Russia

Objective: To study the mineral density of the bone tissue of the lumbar spine and the femoral neck in patients with early axial spondylitis.
Methods: Explored 53 patients (33 men and 20 women) with early axial spondylitis. Patients with a duration of inflammatory pain in the spine were taken for < 3 y: the duration of the disease—1.89 $\pm$ 13.1 months. The diagnosis is made according to the ASAS 2009 criteria for patients—29.2 $\pm$ 5.3 y, BASDAI –4.3 $\pm$ 1.75; ASDAS-CRP-2.9 $\pm$ 1.4. BASDAI > 4, ASDAS-CRP > 2.1 were considered high activity of the disease. Patients were carried out by the densitometry of the femoral neck and the lumbar spine (LII—LIV) using DXA. A decrease in the mineral density of bone tissue were considered to be T-criteria of 2.0 SD and less at least in one studied department. The decrease in the Z-criterion, defined as the ratio of bone density to the age rate, is < 2.0, indicates a decrease in the mineral density of bone tissue.
Results: For all examined patients, the Z -criteria indicators amounted to -0.9 $\pm$ 0.79 SD for the femoral neck and -0.9 $\pm$ 0.97 SD for the lumbar spine. A decrease in the mineral density of bone tissue at least in one department was detected in 11 (20.75%) patients. In 9 (16.9%) patients, a decrease in the mineral density of bone tissue was found in the lumbar spine, in 7 (13.2%) patients—in the femoral bone, a decrease in the mineral density of bone tissue in two departments was observed in 4 (7, 54%) patients. Reliable differences ($p = 0.043$) were found to reduce the mineral density of bone tissue at least in one section between two groups of patients: with a disease duration of 17.9 $\pm$ 13.3 and 28.2 $\pm$ 14.3 months. Association has not been identified between a decrease in the mineral density of bone tissue and age, the floor of patients, the high activity of the disease (BASDAI, ADSAS), acute-phase inflammation indicators (erythrocyte settlement rate, C-reactive protein).
Conclusion: The loss of bone mass with early axial spondylitis begins in the early stages of the disease and is detected in 21% of young patients. Association was found between a decrease in the mineral density of bone tissue and the duration of the disease. A decrease in the mineral density of bone tissue can be considered as a factor in an unfavorable prognosis and taken into account when choosing therapy. Patients, with the first diagnosis of early axial spondylitis, are shown densitometry.

P1159
PREGNANCY AND LACTATION ASSOCIATED OSTEOPOROSIS

S. Daly[1], A. Compton[1], K. Mccarroll[1], R. Lannon[1]

[1]Bone Health & Osteoporosis Unit, Mercer's Institute for Successful Ageing, St James's Hospital, Dublin, Ireland

Pregnancy and lactation associated osteoporosis (PLO) is a rare condition affecting pregnant and lactating women. We report a case of maternal vertebral fractures 2 months post-partum.
Case report: A 33-year-old female presented to her General Practitioner with lower back pain 2 months postpartum following lifting her son from his cot. Her pregnancy had been normal with a spontaneous vaginal delivery. She had no medical history and no regular medications. She exclusively breast fed her infant. An MRI spine was carried out showing T12, L1, L4 and L5 endplate compression fractures. A DXA scan was carried out showing a Z-score at the lumbar spine of -4.4 and at the hip of -2.6. Her vitamin D was 93 nmol/L (normal: 50–100), corrected calcium 2.33 mmol/L (normal: 2.15–2.5) and renal function was normal. Her CTX was 0.238 ng/ml, (normal: 0.016–0.573) osteocalcin 26 ng/ml (normal: 11–43) and P1NP was 66 (normal: 15.1–58.6). Her PTH was low at 8.4 pg/ml (normal: 15–65). Extended secondary screen was normal. A diagnosis of PLO with vertebral fractures was made. Treatment was cessation of breast-feeding and physiotherapy.
Conclusion: During pregnancy, there are significant changes to bone physiology. Oestrogen falls significantly post-partum resulting in increased osteoclast activity and loss of BMD. In addition, lactation contributes to loss of BMD as calcium in milk is derived from the maternal skeleton. This is mediated by PTH-related protein (PTHrP)

which also causes low PTH as seen in this case. BMD usually reduces by 2–8% postpartum. This rapidly recovers on cessation of lactation. PLO is a rare condition affecting pregnant or postpartum women and often presents as vertebral fractures in the early post-partum period. The aetiology is unclear. Possible causes are an increased level of PTHrP during lactation, undiagnosed osteopenia prior to pregnancy or a combination of both. There is likely a strong genetic component with genetic variants WNT1 and LRP5 implicated. The treatment for PLO is cessation of lactation. There is insufficient data to support the use of bisphosphonates, denosumab or teriparatide.

P1160
MICRORNAS: POSSIBLE ROLE IN THE PATHOGENESIS OF TUMORAL CALCINOSIS?

S. Donati[1], G. Palmini[2], C. Aurilia[1], I. Falsetti[1], G. Galli[1], R. Zonefrati[2], R. Di Donato[3], A. Franchi[4], G. Beltrami[5], T. Iantomasi[1], L. Masi[6], G. Picchioni[3], M. L. Brandi[2]

[1]Dept. of Experimental and Clinical Biomedical Sciences, Univ. of Florence, Florence, [2]Fondazione Italiana Ricerca sulle Malattie dell'Osso (FIRMO Onlus), Florence, [3]Stabilimento Chimico Farmaceutico Militare (SCFM)_Agenzia Industrie Difesa (AID), Florence, [4]Dept. of Translational Research and of New Technologies in Medicine and Surgery, Univ. of Pisa, Pisa, [5]Ortopedia Oncologica Pediatrica, AOU Careggi-AOU Meyer, Florence, [6]Metabolic Bone Diseases Unit, Univ. Hospital of Florence, AOU Careggi, Florence, Italy

Objective: Tumoral calcinosis (TC) is an extremely rare disease characterized by lobular calcified masses in the periarticular soft tissues. We have previously isolated a TC-stem cells (SCs) line (TC1-SC) from a primary cell line (TC1) obtained from a TC patient biopsy harboring a novel *GALNT3* mutation. In this study, we investigated the possible epigenetics mechanisms underlying TC progression, focusing on the expression of selected miRNAs and genes related to osteogenic differentiation.
Methods: After the establishment and the characterization of a SCs line, TC1-SC, from the primary established TC cell line, we analyzed the expression of selected miRNAs either predicted in silico to interact with the 3'UTR of *GALNT3* mRNA or involved in osteogenic differentiation. We also investigated the expression profile of the osteogenesis-related genes, and of those genes associated with the FGF23 signaling pathway. These analyses were carried out in TC1 and TC1-SCs lines undergoing osteogenic differentiation up to 21 days. Furthermore, alkaline phosphatase (ALP) activity and calcium-phosphate deposition were quantified by fluorometric assays during the osteogenic differentiation of TC1 (from day 0 to 35).
Results: Collectively, 8 out of 9 selected miRNAs exhibited inverse expression patterns during osteogenic differentiation between TC1 and TC1-SCs, while miR-26a was found to be downregulated in both TC lines. Our analysis revealed, for the first time, the existence of an osteogenic signature genes and miRNAs for the isolated TC1-SCs line. Interestingly, ALP activity was strongly decreased despite the higher presence of crystals of hydroxyapatite in TC1 compared to a primary healthy preosteoblastic cell line induced to differentiate into osteoblasts.
Conclusion: For the first time we have established and characterized a SCs line from a TC patient with a novel *GALNT3* mutation, revealing also a preliminary specific signature of miRNAs for the TC1-SCs line. Regarding this, we are currently evaluating the expression of other miRNAs compared to the primary TC line and studying whether the miR-26 downregulation could be responsible for the TC-associated periarticular calcium deposits by regulating the expression of *ALP*. Overall, these findings could provide a basis for further molecular mechanisms understanding of the TC pathogenesis.
Acknowledgment: Supported by FIRMO Onlus.

P1161
IN VITRO EFFECTS OF 25(OH)D3 ON OSTEOGENIC DIFFERENTIATION PROCESS AND MICRORNAS: A PRELIMINARY STUDY

S. Donati[1], G. Palmini[2], C. Aurilia[1], I. Falsetti[1], F. Marini[2], G. Galli[1], R. Zonefrati[2], T. Iantomasi[1], M. L. Brandi[2]

[1]Dept. of Experimental and Clinical Biomedical Sciences, Univ. of Florence, [2]Fondazione Italiana Ricerca sulle Malattie dell'Osso (FIRMO Onlus), Florence, Italy

Objective: It has been reported that the direct precursor of calcitriol, calcifediol ($25(OH)D_3$), can regulate the expression of several genes through vitamin D receptor (VDR) binding. Recently, the action of $1,25(OH)_2D_3$ in regulating the expression of non-coding RNAs, including microRNAs, has been recognized as a potential anticancer mechanism. Here, we investigated not only the ability of $25(OH)D_3$ to modulate the expression of specific microRNAs but also its effects on the osteogenic differentiation process of mesenchymal stem cells derived from human adipose tissue (hADMSCs).
Methods: Two hADMSCs lines were established from subcutaneous adipose tissues obtained from health donors and cultured in growth medium. Cells were exposed to different concentrations of $25(OH)D_3$ (i.e., 10 μM, 100 nM, 50 nM, and 25 nM) in osteogenic induction (OI) medium for 35 d. Alkaline phosphatase (ALP) and hydroxyapatite (HA) deposits were quantified by fluorimetric assays up to 35 d. In addition, according to the literature, we studied the expression of a preliminary panel of microRNAs for up to 21 d in osteogenic differentiated cells using TaqMan technology.
Results: Our data showed that ALP activity significantly increased in hADMSCs treated with 100 nM $25(OH)D_3$ at 14 and 35 d compared to the control. Regarding the mineralization, in the presence of 100 nM $25(OH)D_3$, the HA deposition was significantly increased at 35 d. These results were consistent with microRNAs analysis, where we reported a higher expression of those microRNAs that have been reported to positively regulate the osteogenic process (i.e., miR-27a-3p, miR-29a-3p, miR-125a-5p, and miR-196b-5p) in cells exposed to 100 nM $25(OH)D_3$ for 14 d.
Conclusion: We observed that 100 nM $25(OH)D_3$ induces osteogenesis of hADMSCs either by increasing ALP activity or by inducing extracellular matrix mineralization. Furthermore, for the first time, we found that 100 nM $25(OH)D_3$ increased the expression of pro-osteogenic differentiation microRNAs. Nowadays, we are evaluating the expression of other miRNAs and osteogenic differentiation markers genes to investigate the potential $25(OH)D_3$-related molecular mechanisms that could play a crucial role in the regulation of osteogenesis. Taken together, our findings could allow the design of novel future therapeutic applications of this molecule against metabolic bone diseases.
Acknowledgments: Supported by Bruno Farmaceutici S.p.A. and FIRMO Onlus.

P1162
SCREENING PRACTICES, PREVALENCE, AND TREATMENT PATTERNS FOR OSTEOPOROSIS IN PATIENTS LIVING WITH HIV: RESULTS FROM AN IRISH HIV CLINIC

S. Donohue[1], D. Fitzpatrick[2], M. Ryan[2], K. Ryan[2], C. O'Flaherty[1], N. Stanley[2], B. Adegbemi[2], K. Mc Carroll[2], C. Bergin[1], R. Lannon[2]

[1]Dept. of Genitourinary Medicine and Infectious Diseases, St James's Hospital, [2]Mercer's Institute for Successful Aging, St James's Hospital, Dublin, Ireland

Objective: As a result of improved life expectancy, osteoporosis is becoming more common among people living with HIV (PLWH). HIV is a well described risk factor for osteoporosis[1] and in this population densitometry (DXA) is recommended in postmenopausal women and men aged ≥ 50[2]. In this study we explore the screening, prevalence and treatment patterns for osteoporosis in PLWH aged ≥ 50 y.
Methods: This was a retrospective review of PLWH ≥ 50 y attending the HIV clinic in our hospital. We examined the proportion of patients with DXA performed as well as the prevalence of osteoporosis based on the lowest T-score recorded at the lumbar spine, neck of femur or total hip. We examined the relationship between osteoporosis and age using ANOVA.
Results: Of 3156 patients attending the clinic, 978 were ≥ 50 and included. The mean age was 56.9 ± 6.0 y and 74.1% were male. 94.6% were referred for DXA, which was completed in 80.5% of the total cohort. Based on DXA, 20.0% of females and 11.3% of males had osteoporosis, while 33% of females had osteopenia compared to 40.5% of males. Of those with osteoporosis, 57.5% were on pharmacological treatment for osteoporosis. Osteoporosis was significantly associated with older age in women ($p < 0.001$), but not in men ($p = 0.751$).
Conclusion: There was a high level of screening for osteoporosis with DXA. 20% of female and 11.3% of male PLWH had osteoporosis by DXA criteria, substantially more prevalent than that reported in the general population[3]. A significant relationship with older age and osteoporosis was found in females but not males. Similar to the general population[3], there is a significant treatment gap with over a third of PLWH with osteoporosis untreated.
References:
1. Borderi M, et al. AIDS 2009;23:1297
2. European AIDS Clinical Society (EACS): Guidelines Version 12.0 (2023)
3. Kanis JA, et al. Arch Osteoporos 2021;16:82

P1163
FACTORS INFLUENCING THE FREQUENCY OF ARTHRITIS FLARES IN PATIENTS WITH GOUT NOT RECEIVING URATE-LOWERING THERAPY: RESULTS FROM A PILOT RETROSPECTIVE STUDY

S. Eliseev[1], V. Zhelyabina[1], I. Kuzmina[1], N. Chikina[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: The severity of gout, including the frequency of arthritis flares, is associated with various factors. However, the accurate prediction of flare frequency remains challenging. Our study aims to analyze the relationship between different factors that may influence the risk of exacerbation in patients with gout who have not received urate-lowering therapy (ULT).
Methods: The study included 116 patients (6 women, 110 men) aged 25–78 with gout, who had not taken ULT. Patients were retrospectively enrolled and assessed during their first visit. Clinical characteristics of gout: arthritis progression, frequency of acute arthritis flares per year, presence of subcutaneous tophi. Analyzed factors included: alcohol consumption, smoking, BMI, presence of comorbidities, diuretic use, blood pressure readings, serum levels of glucose, creatinine, creatine phosphokinase (CPK), gamma-glutamyl transferase (GGT), alkaline phosphatase (ALP), uric acid (UA), and C-reactive protein (CRP).
Results: ≥ 4 arthritis flares per year were found in 40% of patients, subcutaneous tophi in 33.6%, and ≥ 5 affected joints in almost 70% of patients. Serum UA levels correlated with the number of subcutaneous tophi (weak link). No association was found between uricemia levels and the frequency of arthritis flares. Moderate direct correlation between serum UA and GGT levels, and weak correlations with glucose, creatinine, CPK, CRP, BMI, and patient age (at enrollment) were identified. The strongest correlation was between serum UA levels and diastolic blood pressure (DBP); weak positive correlations were found between flare frequency and the number of tophi, DBP, GGT, CPK, and CRP levels. Significant differences in UA levels were observed among patients who consumed alcohol: 543 ± 111 μmol/l and 471 ± 92 μmol/l, $p = 0.001$. Flare frequency was significantly higher in patients taking diuretics, $p < 0.001$. Statistically significant differences in the odds of developing ≥ 4 flares per year were observed: a 1.955-fold increase with a family history of gout (95%CI: 1.224–3.121, $p < 0.05$), a 1.746-fold increase with the presence of tophi (95%CI: 1.161–2.626, $p = 0.007$), a 2.656-fold increase with alcohol consumption (95%CI: 1.766–3.994, $p < 0.001$), a 1.586-fold increase with UA level ≥ 540 μmol/l (95%CI: 1.041–2.416), and a 2.111-fold increase with involvement of ≥ 5 joints over the course of the disease (95%CI: 1.291–3.452, $p = 0.003$).
Conclusion: The frequency of arthritis flares in patients with untreated gout may be associated with the number of tophi, DBP, GGT, CPK, CRP levels, and diuretic use, while serum UA levels may not play a decisive role in predicting the course of the disease.

P1164
COMPARISON OF FREQUENCY AND QUANTITY OF MEAT PRODUCT CONSUMPTION AMONG PATIENTS WITH GOUT AND ASYMPTOMATIC HYPERURICEMIA: PRELIMINARY DATA FROM A PILOT STUDY

S. Eliseev[1], V. Zhelyabina[1], I. Kuzmina[1], N. Chikina[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To comparatively assess the frequency and quantity of meat and fish product consumption among patients with asymptomatic hyperuricemia (AHU) and gout.
Methods: The study included 112 patients with AHU or gout, aged ≥ 18 y, surveyed between January 2022 and January 2023, all with a serum uric acid (UA) level > 360 μmol/l. The diagnosis of gout was established in accordance with the ACR/EULAR 2015 classification criteria for gout. Patients not meeting the ACR/EULAR 2015 criteria were diagnosed with AHU. Initial visit assessments involved a clinical examination, including medical history collection, physical examination, anthropometric data, and standard physical assessment. Laboratory investigations included fasting serum levels of UA, creatinine, and C-reactive protein (CRP). All participants completed the Food Frequency Questionnaire (FFQ). The study was approved by the Ethical Committee of the V.A. Nasonova Research Institute of Rheumatology.
Results: The study included 57 (49.1%) patients with AHU (31 (54.4%) men and 26 (45.6%) women) and 55 (50.9%) patients with gout, predominantly men (51 (92.7%)). Notable were the higher serum UA levels (504.7 μmol/l in the gout group vs. 431 μmol/l in the AHU group), as well as higher levels of creatinine and CRP. The consumption of meat products was mostly similar between patients with gout and AHU. Interestingly, there was one patient each from the gout and AHU groups who consumed beef products 2–3 times a day and one AHU patient who consumed sausage products at the same frequency. Nearly 50 (47%) and 40 (37%) patients with AHU almost never consumed beef sandwiches and mutton products, respectively. The cohort included one AHU patient who was a vegetarian (did not consume meat or fish). Notably, approximately one-fourth of the patients did not consume fish.

Conclusion: The primary finding of our study was the comparable frequency of meat and fish consumption among patients with gout and AHU. This fact may indirectly support the theory that dietary habits do not play a primary role in the genesis of gout, although they are associated with UA levels.

P1165
COMPARISON OF COLORIMETRIC AND ELECTROCHEMICAL (EASY TOUCH GCU ANALYZER) METHODS FOR DETERMINING BLOOD URIC ACID LEVELS IN PATIENTS WITH GOUT AND HYPERURICEMIA IN CLINICAL PRACTICE: PILOT STUDY DATA

S. Eliseev[1], V. Zhelyabina[1], N. Chikina[1], I. Kuzmina[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Hyperuricemia (HU) is a condition characterized by elevated serum uric acid (UA) levels > 360 μmol/l. Often asymptomatic, HU can manifest as episodes of peripheral arthritis (gout) under the influence of various genetic and environmental factors. Achieving normal UA levels, which can be measured by the standard colorimetric method or the less common electrochemical method in clinical self-monitoring, is essential for the remission of this disease. We aimed to compare the results of UA level measurements using the standard colorimetric method and the electrochemical self-monitoring method (Easy Touch GCU analyzer).
Methods: The study included 30 patients with gout, encompassing individuals with current/historical asymptomatic HU and patients with a confirmed diagnosis of gout according to the ACR/EULAR 2015 criteria. The study involved a general examination, medical history collection, and laboratory investigation. UA levels in venous blood serum were measured colorimetrically no later than 5 min after collection, and UA levels in fresh whole capillary blood from the fingertip were measured immediately after collection using the electrochemical method (Easy Touch GCU analyzer).
Results: The average UA level measured by the two methods differed by 13.9 μmol/l (3.9% relative to the colorimetric method). A high correlation coefficient (r = 0.86) indicates a close linear relationship between the compared results and good consistency. The method is also applicable to patients who have achieved normouricemia.
Conclusion: The electrochemical method for determining UA levels in individuals with HU and gout can be used for self-monitoring in actual clinical practice.

P1166
VITAMIN D DEFICIENCY IN PATIENTS WITH GOUT

S. Eliseev[1], V. Zhelyabina[1], I. Kuzmina[1], N. Chikina[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

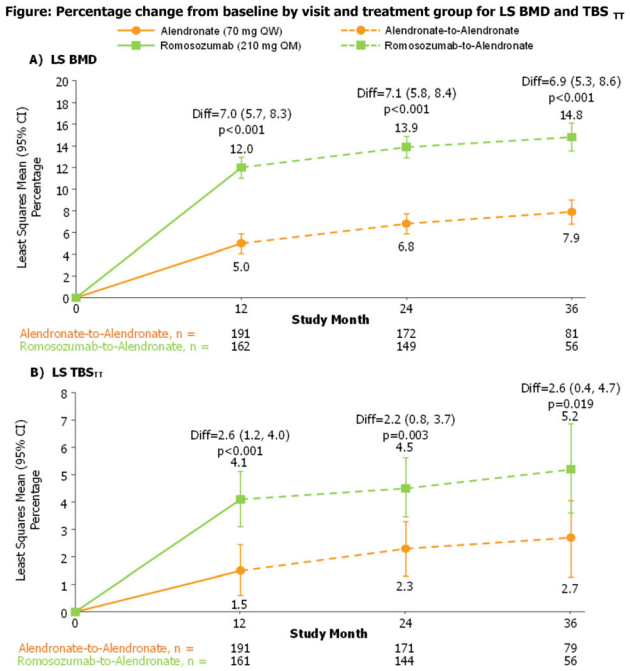
Objective: There is a limited number of studies on the mutual influence of vitamin D and uric acid (UA) levels in patients with gout. We aimed to investigate the interrelation between hyperuricemia and vitamin D levels in patients with gout.
Methods: The study included 79 patients with a confirmed diagnosis of gout. All patients were assessed for levels of uric acid, vitamin D, PTH, C-reactive protein, creatinine, ALT, AST, ALP, and estimated glomerular filtration rate (eGFR) using the CKD-EPI formula.
Results: The majority of the patients included in the analysis were men. The mean vitamin D level was below normal reference values. A vitamin D level of less than 30 ng/ml was observed in 63 patients (79.7%). A moderate correlation between vitamin D level and various factors was noted only with serum calcium levels. Uric acid levels were stratified into quartiles: < 426 μmol/l, 427–479 μmol/l, 480–540 μmol/l, and ≥ 540 μmol/l. An analysis of vitamin D levels and uric acid levels in different quartiles was conducted. Further analysis of uric acid levels, divided into quartiles, and corresponding vitamin D levels did not show statistically significant differences (p = 0.605).
Conclusion: More than 79% of participants exhibited hypovitaminosis. These data indicate a high prevalence of vitamin D hypovitaminosis among patients with gout and may suggest a need for improving prevention and treatment strategies for vitamin D deficiency in this population. The stratification of uric acid levels into quartiles did not reveal significant differences in vitamin D levels, suggesting a potential absence of a direct correlation in this population. This necessitates further research to understand the potential pathways of interaction between vitamin D and UA.

P1167
EFFECT OF ROMOSOZUMAB ON TISSUE THICKNESS-ADJUSTED TRABECULAR BONE SCORE (TBSTT) IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS AND DIABETES: RESULTS FROM THE ARCH STUDY

S. Ferrari[1], D. Betah[2], R. Feldman[3], B. Langdahl[4], M. Oates[2], J. Timoshanko[5], Z. Wang[2], R. Dhaliwal[6]

[1]Geneva Univ. Hospital, Geneva, Switzerland, [2]Amgen Inc., Thousand Oaks, USA, [3]MemorialCare Saddleback Medical Center, Laguna Hills, USA, [4]Aarhus Univ. Hospital, Aarhus, Denmark, [5]UCB Pharma, Slough, UK, [6]Massachusetts General Hospital, Boston, USA

Objective: Diabetes mellitus is associated with reduced bone strength and increased fracture risk.[1] TBS, a gray-level texture index derived from lumbar spine (LS) DXA scans, has been reported to be decreased in patients with diabetes and is associated with increased fracture risk, independent of BMD. In the ARCH trial (NCT01631214), romosozumab (Romo) significantly improved bone mass and bone strength, leading to superior fracture risk reduction vs. alendronate (ALN) alone.[2] We examined the effect of Romo-to-ALN vs. ALN-to-ALN on LS BMD and TBS in patients with diabetes in ARCH.
Methods: Postmenopausal women with osteoporosis and prior fracture were randomised 1:1 to Romo 210 mg monthly or ALN 70 mg weekly for 12 months (M), both followed by 24 M ALN 70 mg weekly. This post hoc analysis included participants with diabetes mellitus at baseline (BL) and LS DXA scan measurements at BL and ≥ 1 post-BL visit (Romo/ALN, n = 195; ALN/ALN, n = 165). BMD and TBS (determined by an updated TBS_{TT} algorithm; TBS iNsight^{TM} v4.0 [Medimaps][3] were assessed on LS DXA scans at BL, M12, M24, and M36.
Results: BL LS BMD was –2.63 for Romo and –2.89 for ALN; BL LS TBS_{TT} was 1.006 and 1.010, respectively. Romo led to significantly greater gains in LS BMD and TBS_{TT} at M12 vs. ALN; these were maintained after transition to ALN and persisted significantly at M24 and M36 vs. ALN alone (Figure). In the Romo/ALN group, the percentage of women with "normal" TBS values ($TBS_{TT} > 1.074$)[4] increased from 23.6% at BL to 50.0% at M36; those with "degraded" TBS values ($TBS_{TT} \leq 1.027$) decreased from 55.8% to 33.9% ($p < 0.001$). A similar trend, albeit with smaller improvement, was observed for ALN/ALN. TBS_{TT} changes were unrelated to LS BMD changes to M36 (Romo/ALN, $r^2 = 0.1493$; ALN/ALN, $r^2 = 0.0429$).



ALN: alendronate; BMD: bone mineral density; CI: confidence interval; Diff: percentage change from baseline for Romo treatment group minus percentage change from baseline for ALN treatment group; LS: lumbar spine; QM: monthly; QW: weekly; Romo: romosozumab; TBS: trabecular bone score; TBSTT: tissue thickness-adjusted trabecular bone score. LS BMD and TBSTT data were analysed based on repeated measures model adjusting for treatment, presence of severe vertebral fracture at baseline, visit, treatment-by-visit interaction, baseline BMD or TBS value as fixed effects, with machine type and baseline BMD or TBS value-by-machine type interaction as covariates, using either a compound symmetry variance covariance structure for BMD or an unstructured variance covariance structure for TBS.

Conclusion: In postmenopausal women with osteoporosis and diabetes, 12 M of Romo followed by 24 M of ALN significantly improved LS BMD and TBS as measured by TBS_{TT} (independently of BMD) to a greater extent than 36 M of ALN alone. These changes may reflect a greater improvement of bone strength by Romo vs. ALN in patients with diabetes.

References:

1. Walle M, Curr Osteoporos Rep 2022;20:398.
2. Saag K, NEJM 2017;377:1417.
3. Shevroja E, JBMR 2019;34:2229.
4. Hans D, Osteoporos Int 2022;33:2517.

Acknowledgement: Funding by UCB Pharma and Amgen Inc.

P1168
PERCENTAGE OF BONE DENSITOMETRY, PRIOR TO ONCOLOGICAL TREATMENT, IN POSTMENOPAUSAL WOMEN DIAGNOSED WITH HORMONE-SENSITIVE BREAST CANCER, BETWEEN JANUARY 2016 AND AUGUST 2022 IN THE COMPLEJO HOSPITALARIO RUBER JUAN BRAVO

T. L. R. Logroño Rezola[1], I. V. Y. Vera Yuste[1], N. C. R. Cuevas Rodriguez[1], B. A. M. De Andrés Martín[1], B. M. P. Mélida Payán[1], S. G. F. Gerechter Fernandez[1]

[1]HU Ruber Juan Bravo Quiron, Madrid, Spain

Objective: Aromatase inhibitors constitute the most frequent adjuvant therapy for breast cancer, bone loss being a subsequent adverse effect. Baseline bone health in postmenopausal women is poorly characterized in prospective series of recently diagnosed breast cancer candidates to therapy with aromatase inhibitors. The objective is to describe the proportion of patients who presented bone health assessment prior to adjuvant therapy with aromatase inhibitors.

Methods: Observational, analytical descriptive, retrospective and longitudinal study. From January 2016 to August 2022, we consecutively included 83 women with a history of breast cancer treated with adjuvant aromatase inhibitors therapy, whose data from their medical records we proceeded to analyse. BMD and risk fracture were measured.

Results: Mean age was 65 y; 24,4% had their BMD assessed before receiving AI therapy. Analysis of baseline data shows half of the women had osteopenia and 40% already presented osteoporosis before therapy with aromatase inhibitors. 80% of them presented T values $\leq$ -2, being potential candidates for anti-osteoporotic treatment. Most women had their BMD assessed after initiating AI therapy, in which 50% already presented osteoporosis and 45% had osteopenia.

Conclusion: Low bone mass was highly prevalent both in the pretreatment and after initiating AI therapy. Therefore, it is crucial to assess BMD before starting therapy with aromatase inhibitors and during cancer follow-up.

P1169
PREVALENCE OF OSTEOPOROTIC FRACTURE IN WOMEN WITH BREAST CANCER TREATED WITH AROMATASE INHIBITORS AT THE HOSPITAL RUBER JUAN BRAVO BETWEEN 2020 AND 2022 WHO DO OR DO NOT RECEIVE ANTIRESORPTIVE TREATMENT

I. V. Y. Vera Yuste[1], T. L. R. Logroño Rezola[1], N. C. R. Cuevas Rodriguez[1], B. A. M. De Andrés Martín[1], B. M. P. Mélida Payán[1], S. G. F. Gerechter Fernandez[1]

[1]HU Ruber Juan Bravo Quiron, Madrid, Spain

Objective: Estrogens are hormones whose deficiency in postmenopausal women increases the risk of osteoporosis and fractures, while their excess may cause breast cancer. Aromatase inhibitors are a widely used treatment for this cancer in postmenopausal women, despite the fact that they increase the risk of fracture due to the estrogen decrease they produce. For this reason, in many cases antiresorptive drugs are used based on risk factors, densitometric and analytical results. Aim. To compare the proportion of osteoporotic fracture in women with breast cancer treated with aromatase inhibitors who did or did not receive antiresorptive treatment.

Methods: Observational, analytical, retrospective, cross-sectional, two groups studied (one received antiresorptives and the other did not). The clinical history of 83 patients were reviewed and the following variables were studied: the prevalence of osteoporotic fracture and the fact of having or not antiresorptive treatment.

Results: The patients who received antiresorptive drugs (59%) had a mean age of 66.4 y and 28.6% of them suffered a fracture, especially vertebral (4.8%) and hip (3.6%). From those who received antiresorptives, 77% received a bisphosphonate, of whom 53% had risedronate. The 52.5% of women suffered from arthralgia. The 36% of the patients were osteopenic and 54.5% had osteoporosis. In those who received antiresorptives, the means of alkaline phosphatase, NTX, and iPTH were 65, 34.3, and 51.2, respectively.

Conclusion: The prevalence of osteoporotic fracture in those receiving antiresorptive treatment is higher than the ones that didn't because they are patients with a higher risk and therefore they are correctly treated. The most frequent fractures are the vertebral and hip ones. All the fractured patients present osteopenia or osteoporosis and no patient with normal results developed fractures. The levels of bone remodeling markers are lower in the group that takes antiresorptive

treatment compared to the one that does not, demonstrating the efficacy of these drugs.

P1170
PREVALENCE OF DENSITOMETRIC OSTEOPOROSIS IN MEN OVER 40 YEARS OF AGE ATTENDING UROLOGY AND/OR RHEUMATOLOGY CONSULTATIONS AT THE RUBER JUAN BRAVO HOSPITAL IN MADRID IN THE YEAR 2022

N. C. R. Cuevas Rodriguez[1], B. M. P. Mélida Payán[1], I. V. Y. Vera Yuste[1], T. L. R. Logroño Rezola[1], B. A. M. De Andrés Martín[1], S. G. F. Gerechter Fernandez[1]

[1]HU Ruber Juan Bravo Quiron, Madrid, Spain

Objective: Osteoporosis is a bone-destroying disease that predisposes the affected population to a greater probability of fractures, thus reducing their quality of life. It has traditionally considered women disease, not taking in consideration men. However, it has been shown that men have a higher mortality rate. We aimed to determine not only the prevalence of osteoporosis in men, but the influence of medical and pharmacological records and other risk factors described in the FRAX.
Methods: Observational, descriptive, cross-sectional, retrospective study. 75 male patients with bone densitometry performed during the year 2022 were studied. The main variable was the presence or absence of osteoporosis. The data were collected by means of medical records.
Results: From 75 patients included in the study, 5 were excluded due to lack of tracking, so finally just 70 of them were studied. The result shown that 26 patients (37.1%) presented osteoporosis.
Conclusion: Statistically significant differences were found relating fragility fracture and falls with the presence of osteoporosis. Furthermore, the study shown as well that asthma and hyperparathyroidism conditions are related to the presence of osteoporosis. Osteoporosis also demonstrated statistically significant differences.

P1171
RISK OF FRACTURE IN PATIENTS WITH OSTEOPOROSIS ATTENDING THE RUBER JUAN BRAVO HOSPITAL RHEUMATOLOGY CONSULTATION IN MADRID DURING 2021 AND 2022

B. A. M. De Andrés Martín[1], N. C. R. Cuevas Rodriguez[1], I. V. Y. Vera Yuste[1], T. L. R. Logroño Rezola[1], B. M. P. Mélida Payán[1], S. G. F. Gerechter Fernandez[1]

[1]HU Ruber Juan Bravo Quiron, Madrid, Spain

Objective: Osteoporosis is a disease that causes decreased bone mass and increased risk of fragility fractures. According to the criteria of the Spanish Society for Bone Research and Mineral Metabolism (SEIOMM) updated in 2022, patients with osteoporosis can be classified according to their fracture risk as: very high risk, those with a BMD with T- score < -3.5 standard deviations (SD), at least 2 vertebral fractures or 1 hip or vertebral fracture with T-score < -3; high risk, those patients with a T-score < -2.5 SD, a fragility fracture or with major risk factors; and moderate-mild risk, those patients with a column T-score < -2.5 SD, a T-score < -2.0 SD in the femoral head, no fractures and less than 65 years of age. Different treatment regimens are recommended for each group. The hypothesis stated that, of the total number of patients with osteoporosis who attended the consultation, 20% had a very high risk of fracture, 40% high, and 30% moderate-mild. The objective was to verify if this estimate was met in the population treated in the rheumatology clinic of the Ruber Juan Bravo Hospital in Madrid during 2021 and 2022.
Methods: To do this, a database was created with information from the medical records of 104 patients with osteoporosis and analyzed using an observational and analytical study.
Results: The results obtained showed that 32.7% of the patients had a very high risk of fracture, 58.7% high, and 8.7% moderate-mild.
Conclusion: These results represent a higher percentage of patients with high and very high risk of fracture and a lower percentage with moderate-mild risk than expected. For this reason, it is important to treat patients with high and very high risk of fracture from specialized units.

P1172
INCIDENCE OF OSTEOPOROSIS IN PATIENTS WITH RHEUMATOID ARTHRITIS WITH PRE-TREATMENT RHEUMATOID ARTHRITIS TREATMENT FROM 2018–2021 IN THE HOSPITAL RUBER JUAN BRAVO

B. M. P. Mélida Payán[1], B. A. M. De Andrés Martín[1], N. C. R. Cuevas Rodriguez[1], I. V. Y. Vera Yuste[1], T. L. R. Logroño Rezola[1], S. G. F. Gerechter Fernandez[1]

[1]HU Ruber Juan Bravo Quiron, Madrid, Spain

Objective: Loss of bone mass density is observed in osteoporosis. This loss is measured through what is known as bone densitometry (DXA). Osteoporosis is considered itself a severity factor or bone fracture complication, and it is simultaneously the main complication of rheumatoid arthritis. Treatment effect on bone loss for patients that combine both pathologies is still unclear. While Methotrexate is used in rheumatoid arthritis cases, it can also be harmful for osteoporosis. It was estimated that the incidence of osteoporosis in rheumatoid arthritis patients before treatment is 5%. This percentage was reported in scientific papers on the topic.
Methods: It was an observational, descriptive, retrospective and longitudinal study, aimed at rheumatoid arthritis patients, that belonged to the Rheumatology Unit at Madrid's HJRB, aged above 18 and studied between 2018–2021. In order to calculate the sample size, the proportion estimation formula was used, along with the GRANMO calculator, and despite the result obtained was 82 individuals, finally only 56 could be included. Data was pseudonymized and assessed through a descriptive and bivariate analysis. Osteoporosis was considered the main variable and it was measured with the DXA technique.
Results: The study showed that 21,4% of the patients suffered osteoporosis before taking any rheumatoid arthritis treatment, and the resting 78,6% didn't. In this study, the number and proportion of women that had osteoporosis previous to rheumatoid arthritis treatment surpassed the number of men. DAS28 results mean was 3,22, which is considered rheumatoid arthritis moderate activity.
Conclusion: Osteoporosis incidence in individuals that suffer rheumatoid arthritis a month after diagnosis and prior to any treatment turns out to be higher than documented in other studies.

P1173
REAL-LIFE EXPERIENCE OF BUROSUMAB TREATMENT IN PATIENTS WITH TUMOR-INDUCED OSTEOMALACIA

Z. Belaya[1], S. Gronskaia[1], Y. Buklemishev[2], L. Rozhinskaya[1], S. Rodionova[2], I. Uljanova[1], G. Melnichenko[1]

[1]Endocrinology Research Centre, [2]National Medical Research Center of Traumatology and Orthopedics named after. N.N. Priorov, Moscow, Russia

Objective: To evaluate patients who required burosumab treatment among the referral population with tumor induced osteomalacia (TIO).
Methods: We evaluated patients with biochemically confirmed diagnosis of TIO referred to the Endocrinology Research Centre between July 2018 and December 2023 who required burosumab treatment. Clinical and biochemical characteristics of patients were evaluated before burosumab initiation as well as disease outcome following 6–24 months of treatment. The levels of iFGF23 were measured using ELISA Kit Biomedica BI-20700, the median values in serum of healthy individuals were 14.8 [3.8;25.0]. Phosphate levels (reference range 0.74–1.52 mmol/l), alkaline phosphatase ALP (reference range 40–150 IU/l), PTH (reference range 15–65 ng/mL) were measured by Abbott Architect c8000; tubular reabsorption of phosphate (TRP) was calculated at http://www.scymed.com/en/smnxps/pshpd274.htm. Pain measurement was done using a pain scale where 0 meant no pain and 10—extreme pain. BMD were measured prior to and 6–12 months after treatment initiation using GE iDXA machine.
Results: We included 7 patients: 2 (28.6%) were females, the mean age (± standard deviation) was 47 ± 9 y, and mean weight was 81 ± 22.2 kg. In 5 cases curative surgery were not possible (tumor localisation was in head and neck (n = 2), in calcaneus bone (n = 1), in sacrum (n = 1), in wrist bone (n = 1)), and in 2 cases no tumors were found. The starting dose of burosumab was 0.5 mg/kg which was escalated to the maximum of 2 mg/kg. Biochemical data before the treatment were: serum phosphorus 0.43 ± 0.1 mmol/L, PTH 76 ± 44.0 ng/mL, intact FGF23, 750 ± 1694 pg/ml, TRP 55 ± 17%, ALP 178 ± 70 IU/l. At the time of diagnosis, all patients had multiple pathological fractures with a decrease in height of 15 ± 8 cm. One patient could move independently, 3 patients used crutches and 3 used wheelchairs. Evaluation of 7 patients was available after 6–24 months of treatment. The increase in BMD at the total hip (TH) was 18 ± 14% and femoral neck (FN) showed highly significant increases compared to baseline 20 ± 27%. Before treatment patients suffered from severe pain (8 ± 1 in a pain scale). After treatment the mean pain score was mild 2 ± 1. Mean phosphate levels were 0.9 ± 0.3 mmol/L normalized in 6 out of 7 subjects with clinical recovery. The required burosumab dose was 1.2 ± 0.6 mg/kg every 4 weeks (50 to 150 mg/4w)). Burosumab was generally well tolerated. The one case of partial response could be explained by a large sacrum tumor of 40 mm and the highest FGF23 levels of 4588.3 pg/ml. This case may require a higher dose of burosumab.
Conclusion: Burosumab is a promising option in case of an unresectable or occult FGF23 producing tumor as it is effective at phosphate level normalization, BMD gain, new fracture prevention and pain relief. Initial FGF23 levels may affect the required burosumab dose to achieve recovery.
Acknowledgement: Funding 1,023,022,400,002–6-3.2.18.

P1174
A RARE CASE OF HIGH DOSE TERIPARATIDE TREATMENT FOR RESISTANT POSTSURGICAL HYPOPARATHYROIDISM DEVELOPED IN A RENAL TRANSPLANT RECIPIENT

S. Gronskaia[1], E. Senjushkina[1], L. Rozhinskaya[1], E. Mamedova[1], N. Platonova[1], Z. Belaya[1]

[1]Endocrinology Research Centre, Moscow, Russia

Hypoparathyroidism (HypoPT) is a rare disease characterized by low calcium with non-adequate PTH elevation. It may manifest in chronic kidney disease (CKD) patients after total parathyroid surgery. Teriparatide, rhPTH(1–34) is a component of human PTH which may be suggested in case of severe hypoparathyroidism for an out-of-label substitutional treatment. We report a case of post-kidney transplantation male patient with severe HypoPT after total parathyroidectomy.
Case report: A 25 -year-old male renal transplant recipient presented with severe bone pain, paresthesia, and tetany. He had a medical history of CKD starting from 7 y, initiated hemodialysis at age 14, and underwent kidney transplantation at age 24. Due to end-stage renal disease he was diagnosed with tertiary hyperparathyroidism complicated by renal osteodystrophy and underwent total parathyroidectomy one year prior to transplantation. CT scan showed a reduction in vertebral bodies height > 30%, signs of fibrosis osteitis in other bones. DXA did not reveal a decrease in BMD. Laboratory evaluation showed low calcium corrected for albumin 1.3–1.55 mM/L (RR: 2.15–2.55), low Ca ionized 0.72–0.78 mM/L (RR: 1.03–1.29), high phosphate (Pi) 2.28 mM/L (RR:0.74–1.52), PTH—24.2 pg/ml within the reference range, serum creatinine (SCr) levels 148 mcmol/L, GFR 45 ml/min, and increased bone turnover markers osteocalcin 100.2 ng/ml, CTX > 6.00 ng/ml. Daily teriparatide 40 mcg, calcium 3 g, alfacalcidol 2mcg and cholecalciferol 2000 IU were initiated. After 3 d the teriparatide dose was increased to 60 mcg/d and calcium to 4 g/d, after a further 5 d the dose was increased to 80 mcg/d and after a further 2 d to 120 mcg/d with final achievement of calcium and phosphate normalisation. After 1 month of treatment with teriparatide 120 mcg/d, calcium carbonate 4 mcg, alfacalcidol 2mcg and cholecalciferol 2000 IU clinical improvement was observed with absence of pain, reduction in parestesia, normalization of Ca corrected for albumin 2.01 mmol/L, phosphate 1.28 mmol/L, SCr 149.97 mcmol/L, GFR 45 ml/min. The teriparatide dose was reduced to 80 mcg/d and after 1 month to 40 mcg/d with reduction calcium carbonate to 2 mg, alfacalcidol to 1 mcg with normal laboratory parameters after one year.
Conclusion: in this case teriparatide was an effective and safe treatment of HypoPT to overcome the post-dialysis resistance of bone to PTH and maintain treatment in a renal transplant recipient. This case add to our knowledge to the management of severe chronic HypoPT in CKD patients.
Acknowledgement: Funding 1,023,022,400,002–6-3.2.18.

P1175
A NEW MUTATION IN THE CDKN2B-GENE ASSOCIATED WITH PRIMARY HYPERPARATHYROIDISM AND MEN-4

S. H. J. Scharla[1], U. G. Lempert[2]

[1]Practice Endocrinology and Diabetes, Bad Reichenhall and Univ. of Munich (LMU), [2]Practice Endocrinology and Diabetes, Bad Reichenhall, Germany

Up to 10% of patients with multiple endocrine neoplasia (MEN) type 1 do not have mutations of the MEN1 gene. These patients may have mutations in other genes, such as CDNK1B or CDKN2B and are described to have MEN type 4. We report the detection of a new mutation in the CDKN2B-gene (cyclin-dependent kinase inhibitor 2B) in a patient with primary hyperparathyroidism and in family members.
Case report: The female patient (age 56 y) was transferred from an orthopedic specialist for further evaluation of osteoporosis (T-score -2.9 in the DXA-measurement at the lumbar spine, and rib fractures) and increased serum calcium. Serum-calcium was slightly increased with 2.6 mM and PTH was increased with 84 ng/L. No other hormonal abnormality was detected. Renal calcium clearance was increased. 25-OH-vitamin D was in the normal range with 76 nM. Ultrasound suggested a small parathyroid adenoma at the left caudal thyroid lobe. The molecular panel diagnostics found a mutation in the CDNK2B gene (c.209_210deICG p(Ala70Glyfs*16), heterozygote (Analysis done by Dr. R. Salazar, Labor Heidrich, Hamburg). This mutation was classified as variant of unclear significance and has not

been described before. The mother of the patient was also heterozygote carrier of the same mutation and had a normal calcium (2.46 mM) and a PTH in the upper normal range (47 ng/L). The sister of the patient was also a heterozygote carrier of the mutation and exhibited a serum calcium in the upper normal range (2.45 mM) associated with a PTH at the upper normal limit (54 ng/L) and had additionally a history of multiple atraumatic fractures. The daughter of the index patient did not inherit the mutation and had a normal calcium (2,3 mM) and normal PTH (32 ng/L).
Conclusion: This novel mutation in the CDKN2B-gene appears to be related to MEN type 4. Genetic screening for suspected familial hyperparathyroidism may be recommended in order to allow early diagnosis and treatment.

P1176
UP TO 9.3-YEAR FOLLOW-UP STUDY ON DENOSUMAB FOR OSTEOPENIA AND OSTEOPOROSIS: COMPARISON BETWEEN TRABECULAR AND CORTICAL BONE MINERAL DENSITY IN SPINES MEASURED BY QUANTITATIVE COMPUTED TOMOGRAPHY

S. Harada[1], S. Fuchs[1], E. Boehm[2], M. Weigl[2], U. Mansmann[3], I. Feist-Pagenstert[2]

[1]Dept. of Orthopaedics and Trauma Surgery, Musculoskeletal Univ. Center Munich (MUM), LMU Hospital/ Institute for Medical Information Processing, Biometry and Epidemiology (IBE), Faculty of Medicine, LMU, Pettenkofer School of Public Health, [2]Dept. of Orthopaedics and Trauma Surgery, Musculoskeletal Univ. Center Munich (MUM), LMU Hospital, [3]Institute for Medical Information Processing, Biometry and Epidemiology (IBE), Faculty of Medicine, LMU Munich, Pettenkofer School of Public Health, Munich, Germany

Objective: To examine the effects of denosumab not only on vertebral trabecular but also on vertebral cortical BMD in the same vertebrae, evaluated by one or more repeated QCT over 9 y.
Methods: Men and women aged $\geq$ 49 y, with osteopenia or osteoporosis, receiving denosumab 60 mg subcutaneously every 6 to 9 months, underwent 1 or more QCTs to measure both trabecular and cortical BMDs in spine at the University of Munich Hospital. Each volumetric BMD was calculated as the mean value of the respective right and left regions in the same vertebral bodies between the 12th thoracic and 5th lumbar vertebrae, without any fractures, sclerotic lesions, or artificial devices. We assessed the associations between vertebral trabecular and cortical BMDs in the same vertebrae within patients, by adapting multiple linear regression model, 2-way repeated measurement analysis of variance test, and multivariate linear mixed-effects model.
Results: Between 8 d and 4.3 y (mean 18.7 $\pm$ 9.6 months) after starting denosumab, we performed the initial QCTs for 162 patients (female 86%, mean age 75.5 $\pm$ 7.3 y), with additional follow-up QCTs for 100 patients among them, until 9.3 y since denosumab initiation. A total of 312 QCTs were included in the analyses. Vertebral cortical BMDs were positively correlated with vertebral trabecular BMDs within patients, after adjustment for age, gender, and time from the first denosumab injection (correlation coefficient 0.32, $p < 0.0001$). Over the follow-up time, with random effects for patients and with fixed effects adjusted for age, gender, and the other part of vertebral BMDs, the vertebral cortical BMDs decreased by 2.80 [95%CI: 0.76 to 4.82] mg/cm^3 ($p = 0.008$) per year, whereas the vertebral trabecular BMDs increased by 0.88 [95%CI: 0.32 to 1.44] mg/cm^3 ($p = 0.003$) per year.
Conclusion: During our 9.3-y follow-up period after the first denosumab injection, vertebral cortical BMDs were positively correlated with vertebral trabecular BMDs. Our new findings highlighted the larger decrease in vertebral cortical BMDs over time compared to the stable vertebral trabecular BMDs over time.

P1177
INFLUENCE OF GLOMERULAR FILTRATION RATE ON BONE MINERAL DENSITY IN PATIENTS WITH COXARTHROSIS

F. Ilchenko[1], S. Hryvenko[1], I. Kaminsky[1], N. Shadchneva[1], E. Keledzhyyeva[1], V. Kaliberdenko[1], E. Kulieva[1], E. Mureyko[2]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, [2]N.N. Petrov National Medicine Research Center of Oncology, Saint Petersburg, Russia

Objective: Currently, osteoarthritis (OA) is one of the most widespread joint diseases. With this pathology, normal or even increased BMD is often observed. However, there are often patients in whom the presence of OA is combined with reduced BMD values, i.e. with osteoporosis (OP). The presence of chronic kidney disease in patients with OA is one of the reasons for the development of secondary osteoporosis and has prognostic significance for this disease. We aimed to study the state of BMD in patients admitted for hip replacement depending on the stage of chronic kidney disease (CKD), taking into account existing risk factors.
Methods: The study involved 165 patients aged from 50–83 y (mean age 63.9 $\pm$ 3.89 y) with stage 1–3 CKD and risk factors for osteoporosis (female—80%, male—20%). All patients were divided into 3 groups, depending on the presence and stage of CKD.
Results: Normal BMD values were recorded in 29 patients (17.6%). In 136 patients, a violation of BMD was noted: of these, in 63 patients (38.2%) at the level of indicators of osteopenia, in 73 patients (44.2%) at the level of indicators of osteoporosis. Depending on the stage of CKD, the following results were obtained. In stage 1 CKD, normal BMD values were recorded in 9 patients (25.0%), BMD at the level of osteopenia in 13 patients (38.2%), BMD at the level of osteoporosis in 12 patients (36.8%). In stage 2 CKD, normal BMD values were recorded in 18 patients (19.1%), BMD at the level of osteopenia in 35 patients (38.8%), BMD at the level of osteoporosis in 38 patients (42.1%). In stage 3 CKD, normal BMD values were recorded in only 3 patients (7.6%), BMD at the level of osteopenia in 14 patients (36.7%), BMD at the level of osteoporosis in 22 patients (55.7%). From the presented data it is obvious that in CKD 3 the incidence of osteopenic syndrome significantly increases in comparison with the group of patients with normal GFR values.
Conclusion: In 82.4% of patients with chronic kidney disease admitted for hip replacement, there is a decrease in BMD. In the presence of stage 3 CKD, a decrease in BMD to the level of osteopenia and osteoporosis is significantly more often observed, which must be taken into account when performing joint replacement.

P1178
PORTRAIT OF A PATIENT WITH SYSTEMIC LUPUS ERYTHEMATOSUS FOR THE PRESCRIPTION OF THE TYPE I INTERFERON INHIBITOR ANIFROLUMAB

B. Issayeva[1], E. Aseeva[2], T. Reshetnyak[2], N. Nikishina[2], S. Issayeva[1], M. Saparbayeva[1], M. Bizhanova[1], A. Amanzholova[1]

[1]Asfendiyarov Kazakh National Medical Univ., Almaty, Kazakhstan, [2]Rheumatology, Federal State Research Institution (FSRI) named after V. A. Nasonova, Moscow, Russia

Objective: In recent years the use of monoclonal antibodies that block activity of type I interferon (IFN) or its receptors has become the new approach in the pharmacotherapy of systemic lupus

erythematosus (SLE). We aimed to characterize patients with SLE treated with the type I IFN receptor inhibitor anifrolumab (AFM, Saphnelo).
Methods: The prospective 12-month study included 21 patients with SLE who met the 2012 SLICC criteria. Standard laboratory and immunological markers for SLE were examined in all patients. The SLEDAI-2 K index was used to determine the activity of SLE and the CLASI index was used to determine the severity of the mucocutaneous syndrome. Organ damage was assessed using the SLICC/ACR Damage Index (DI). The LupusQol and FACIT-Fatigue questionnaires were used to analyze health-related quality of life (HRQoL).
Results: Female patients prevailed in the study, female/male ratio 17 (81%)/4 (19%), median age 31 [27; 46] y, disease duration 9 [6.0; 11.0] y. The majority of patients (86%) had moderate or high disease activity according to the SLEDAI-2 K index. Among the clinical manifestations of SLE, skin and mucous membranes lesions predominated (81%). Non-erosive polyarthritis of varying severity was observed in 66% of cases. Serositis showed 24% of patients (pleurisy, pericarditis), 43% had hematological abnormalities (hemolytic anemia, leukopenia, lymphopenia) and 14% urinary syndrome (daily proteinuria up to 0.5 g/l and/or urinary sediment – leukocytes/erythrocytes/cylinders up to 5 in the field of view in the absence of urinary tract infection). All patients had immunological disorders. 14% of them were diagnosed with antiphospholipid syndrome (APS) and 43% with Sjögren's syndrome. All patients received hydroxychloroquine, 95% received glucocorticoids (GC) from 5–60 mg/d, 66% received immunosuppressants (cyclophosphamide, mycophenolate mofetil, azathioprine, methotrexate). 33% of patients had anamnesis of treatment with biologic disease modifying antirheumatic drugs (rituximab, belimumab, dual anti-B-cell therapy) and Janus kinase inhibitor baricitinib. All patients experienced a significant deterioration in HRQoL.
Conclusion: The indications for prescribing AFM to 21 patients with SLE were: active SLE according to SLEDAI-2 K and/or CLASI with predominant involvement of skin, its appendages and development of polyarthritis with immunological disorders, intolerance/ineffectiveness of previous standard therapy and inability to achieve low average daily doses of oral GCs. Other clinical manifestations in some patients were: serositis, mild hematological disorders (Coombs-positive anemia, leukopenia), urinary syndrome. AFM could be prescribed for a combination of SLE with secondary APS and Sjögren's syndrome as well as for a high DI SLICC.

P1179
OVEREXPRESSION OF INOSITOL-REQUIRING ENZYME-1 (IRE-1) INHIBITS CHONDROCYTE DIFFERENTIATION

Y. S. Eom[1], S. J. Kim[1]

[1]Kongju National Univ., Dept. of Biological Sciences, Gongju, South Korea

Objective: Chondrocyte differentiation is a critical molecular process that governs the structural and functional features of cartilage and bones. In some skeletal degenerative diseases such as Osteoarthritis, Rheumatoid arthritis and lupus affect the differentiation process resulting in the degradation of differentiation markers and instigating inflammation. Our previous experiments have indicated that IRE-1 overburdens the endoplasmic reticulum with the accumulation of unfolded proteins that disturb the chondrocyte differentiation when exposed to a dedifferentiating agent. Therefore, the current study investigated the molecular effects of IRE-1 transduced inside rabbit articular chondrocyte cells.
Methods: Growth and maintenance of articular chondrocytes: A total of 30 New Zealand rabbits (2 weeks old) were used irrespective of gender having weight of about 150–200 g to extract the primary chondrocytes. Cell transfection: The siRNA (5'-GAUGUCCCA-CUUUGUGUCC-3') and cDNA (NM_001433) of IRE-1 was also purchased and transfected to evaluate the effect on chondrocyte phenotype. Immunoblotting analysis: After BCA quantification, a calibrated concentration of protein lysate was used to separate protein of interest on the gel comprised of sodium dodecyl sulfate–polyacrylamide through electrophoresis. Proteoglycan staining analysis: 0.1% alcian blue was prepared in 0.1 M of hydrochloric acid to be used as a quantifying agent to detect the proteoglycan level of treated chondrocytes.
Results: When IRE-1 was transduced at various concentrations in these cells resulted in an increase in IRE-1 gene expression which in turn decreased the type II collagen and proteoglycan levels in the chondrocytes without causing any cell death or apoptosis. Immunofluorescence data showed that type II collagen production was severely affected by IRE-1 overexpression which corroborated both phenotypic and immunoblotting data.
Conclusion: Our study discovered that IRE1 is a novel target whose inhibition can revive the production and expression of proteoglycan and differentiation markers and should be further used for drug design and development studies.

P1180
HOSPITALIZATIONS FOR HIP AND NON-HIP MAJOR OSTEOPOROTIC FRACTURES IN BELGIUM: TRENDS BETWEEN 2010–2021

S. Janssens[1], E. Gielen[1], M. R. Laurent[2], A. Sermon[3], M. Herteleer[3], M. Dejaeger[1]

[1]Dept. of Public Health and Primary Care, Division of Gerontology and Geriatrics, KU Leuven, Leuven, [2]Dept. of Geriatric Medicine, Imelda Hospital, Bonheiden, [3]Dept. of Development and Regeneration, Division of Locomotor and Neurological Disorders, KU Leuven, Leuven, Belgium

Objective: The long-term epidemiological trends of hospitalization for major osteoporotic fractures (MOF) (fractures of the hip, distal femur, pelvis, humerus, wrist, and spine) in patients aged 50 years and over in Belgium are unknown. The aim of this study was to describe the incidence and trends of hospitalizations for MOF in patients aged 50 y and over in Belgium between 2010–2021.
Methods: Population-based, retrospective study based on hospitalization data extracted from the national database NIHDI and demographical data from the Belgian Federal Bureau for Statistics. Data were combined to determine the crude and age-standardized incidence of hospitalizations for fractures of the hip, distal femur, pelvis, humerus, wrist, and vertebrae using 2010 as the reference year.
Results: A total of 445,234 hospitalizations for MOF were reported between 2010–2021 (excluding 2015). Hospitalizations for MOF increased by 5.8% between 2010–2021 ($p = 0.013$) with a higher increase in men (12.1%; $p = 0.001$) compared to women (4.1%; $p = 0.041$). The crude hospitalization incidence per 100,000 for all MOF decreased from 990 to 910 between 2010–2021 ($p = 0.572$). The age-standardized incidence for any MOF in men declined from 5.30/1,000 to 4.42/1,000 ($p = 0.010$). In women, a very similar decrease of 16.0% was observed (13.84 to 11.62; $p = 0.003$). Hospitalizations for both hip and non-hip MOF showed a decrease in both sexes.
Conclusion: Although a declining trend in the crude incidence per 100,000 and age-adjusted incidence of hospitalizations for MOF (hip, distal femur, pelvis, humerus, wrist, and spine) was observed, the absolute number of hospitalizations for MOF continued to rise due to aging of the Belgian population.

P1181
ORTHOGERIATRIC CO-MANAGEMENT FOR OLDER PATIENTS WITH A MAJOR OSTEOPOROTIC FRACTURE: AN OBSERVATIONAL PRE-POST STUDY

S. Janssens[1], A. Sermon[2], M. Deschodt[1], K. Fagard[1], M. Cerulus[3], H. Cosyns[3], J. Flamaing[1], M. Herteleer[2], M. Dejaeger[1]

[1]Dept. of Public Health and Primary Care, Division of Gerontology and Geriatrics, KU Leuven, [2]Dept. of Development and Regeneration, Division of Locomotor and Neurological Disorders, KU Leuven, [3]Dept. of Geriatric Medicine, Univ. Hospitals Leuven, Leuven, Belgium

Objective: To evaluate if nurse-led orthogeriatric co-management in patients with a major osteoporotic fracture results in better outcomes than inpatient geriatric consultation.
Methods: This single-center observational pre-post effectiveness study took place at the traumatology ward of the University Hospitals Leuven in Belgium. We evaluated 108 patients aged 75 y and older hospitalized with a major osteoporotic fracture in each cohort (usual care group with inpatient geriatric consultation vs. nurse-led orthogeriatric co-management). The intervention included proactive geriatric care, a patient's self-reported evaluation of premorbid status, a comprehensive geriatric evaluation followed by multidisciplinary interventions, and systematic follow-up. The primary outcome was the proportion of patients having one or more in-hospital complications. Additionally, a process evaluation of the intervention's core components and adherence to proactive geriatric care processes was performed.
Results: After controlling for confounding variables in a multivariable logistic regression model, the odds for any in-hospital complication in the intervention group decreased by 51% compared to the usual care group (OR = 0.49 (95%CI: 0.26–0.92), p = 0.027). Delirium incidence decreased by 13% (34 vs. 21%; p = 0.003). Furthermore, the incidence of congestive heart failure and pneumonia decreased by 3% (p = 0.269) and 5% (p = 0.119), respectively. No differences were observed in the incidence of deep venous thrombosis, pulmonary embolism, myocardial infarction, urinary tract infection, and in-hospital mortality. Adherence to the intervention's core components was as follows: completion of a self-reported questionnaire to map premorbid status (38%), multidimensional evaluation (100%), development of an individual care plan (100%), and systematic follow-up (81%). Regarding the proactive geriatric care processes, screening for dysphagia and daily food intake were introduced in clinical practice (0% vs. 70%, 0% vs. 52%), more patients received a laxative if they did not pass stool (67 vs. 94%), and more patients received calcium-vitamin D supplements (20 vs. 58%), all significant with $p < 0.001$.
Conclusion: Implementation of nurse-led orthogeriatric co-management resulted in significantly higher fidelity to proactive geriatric care processes and in a significant reduction of in-hospital delirium incidence and an overall reduction in in-hospital complication rate.

P1182
IMPROVEMENT OF BONE MINERAL DENSITY WITH HORMONE REPLACEMENT THERAPY IN PATIENT WITH DELAYED DIAGNOSIS OF PRIMARY OVARIAN FAILURE DUE TO TURNER SYNDROME MOSAICISM: CASE REPORT

S. Jovanovska Mishevska[1], I. Bitoska[1], A. Mucha[1], T. Prosheva Bajraktarova[1], B. Todorova[1], S. Markovikj[1]

[1]Univ. Clinic of Endocrinology, Diabetes and Metabolic Disorders Skopje, Skopje—Centar, North Macedonia

Patients affected with Turner Syndrome (TS) suffer low BMD and high risk of skeletal deformities, with estrogen deficiency being considered among the main contributors towards early-onset osteoporosis. We present a case of improved of BMD with hormone replacement therapy in patient with delayed diagnosis of primary ovarian failure due to Turner syndrome mosaicism.
Case report: The patient has been initially referred to our department for evaluation of short stature and primary amenorrhea at the age of 18. Determination of pituitary–gonadal and pituitary-thyroid function, growth hormone and carbohydrate metabolism indices in the peripheral blood were investigated. Patient underwent pelvic ultrasound and karyotype. Hormone replacement therapy (HRT) for TS was initiated. BMD by DXA and serum bone metabolic parameters in the peripheral blood were investigated before the initiation of HRT and at 2-year intervals afterwards. Results: Patients karyotype revealed presence of an X isochromosome with two q arms—46,X,izoX(q), leading to the diagnosis of Turner syndrome mosaicism. Hypoplastic uterine endometrium and underdeveloped gonadal structures were detected by pelvic ultrasound. Initial BMD of lumbar vertebra by DXA showed spinal osteopenia (0.832 ± 0.067 g/cm^2) with vertebral BMD Z-scores ranging from –2.4 to -1.8. Initial improvement in BMD was shown at 2 y after initiation of HRT, and the latest spinal BMD performed at the age of 26 is within age-specific reference ranges (1.100 ± 0.037 g/cm^2) with vertebral BMD Z-scores ranging from –0.5 to -0.2.
Conclusion: Inadequately treated primary ovarian insufficiency is among the risk factors for secondary osteoporosis. Early initiation of HRT and ensuring compliance with HRT are the cornerstones of osteoporosis prevention in women with Turner syndrome.

P1183
REDUCTION IN TOTAL NUMBER OF DRUGS IN THE FINAL "GERIATRIC DEPRESCRIPTION [GD]" CAN SIGNIFICANTLY REDUCE THE NUMBER OF FALLS AND POSSIBILITY OF FRAGILITY FRACTURES

S. K. B. Bajaj[1]

[1]Falls Institute of India [FII], Nagpur, India

Objective: To prove that reduction in total number of drugs an older adult [OA] is taking daily, excluding nutritional supplements, leads to significant reduction in future falls and fragility fractures.
Methods: The principle investigator [PI] studied the prescriptions of registered patients in Falls Institute of India [FII]. This is a retrospective study of 140 patients between 2015–2024. Out of 140, 82 were females and 58 were males. The age group range was from 50–99 y. The definition of number of drugs considered was: non-polypharmacy [0–4 drugs], polypharmacy [5–8 drugs], hyperpolypharmacy [9 + prescription drugs], Over-the-counter drugs. It was observed by the PI that an older adult has to consult multiple medical specialists for multiple co-morbidities. It is observed that there was no communication amongst the doctors regarding the choice of drugs to be prescribed finally. There is nobody to co-ordinate between family members and multiple doctors. Also regarding the concept of geriatric medicine in general and of deprescription in particular is in neonatal stage in India. Every patient was given at least 3–5 unnecessary drugs specially PPI, NSAID [specially aspirin], opioids like tramadol, anti-diabetic drugs, diuretics and sedatives, etc. The PI studied the prescriptions of all the 140 patients given to them in last 9 y. It was found that everyone was given polypharmacy or hyperpolypharmacy. After coming in contact for first time with FII, each patient was given final geriatric deprescription. The list of drugs to be stopped was clearly mentioned in bold letters in "STOP MEDICATIONS".

Results: This study of 140 patients between 2015–2024 clearly indicates that due to lack of knowledge regarding importance of deprescribing and communication gap amongst the Indian doctors, the older adults are exposed to fall risk increasing drugs.
Conclusion: The total number of falls, leading to fragility fractures can be significantly reduced by using various deprescribing tools like AGS's Beers Criteria, US Deprescribing Network. WHO's list of potentially inappropriate medication, etc.
References: AGS's Beers Criteria, US Deprescribing Network, Canadian Deprescribing Network.
Acknowledgment: Indian Deprescribing Network.

P1184
IMPLEMENTING IMPROVED TREATMENT FOR PATIENTS AT HIGH RISK OF FRACTURE IN PRIMARY CARE: EXPERIENCES FROM A HYBRID DIGITAL AND CLINICAL EVALUATION MODEL OF CARE

S. K. Nedungayil[1], E. V. McCloskey[2], S. Davis[3]

[1]East Lancashire Hospital NHS Trust, Blackburn, [2]Metabolic Bone Centre, Northern General Hospital, Sheffield, [3]Interface Clinical Services Limited, Leeds, UK

Objective: A large treatment gap exists in primary care osteoporosis management. We evaluated the use of a hybrid digital and clinical assessment method for risk assessment, case evaluation and management of patients in primary care.
Methods: A software algorithm analyzed electronic patient records from 551,550 people across 59 GP practices in North England to identify patients based on NICE CG 146 fracture risk assessment criteria and perform automated individual FRAX fracture risk assessment (without BMD). This was complemented by a pharmacist check on data accuracy and recommendation of appropriate management in 3 groups of high risk patients (those with a diagnosis of osteoporosis; at high-risk but not on treatment; on treatment needing medication review).
Results: 208,515 men and women over 50 were included, of whom 153,206 fulfilled the NICE criteria. A high-risk group of 27,219 individuals (13.1% of those over 50) was identified, of whom 10,361 (38.1%) had a confirmed diagnosis of osteoporosis following pharmacist evaluation. While 58.0% of the individuals with osteoporosis had a prior fracture, only 35.4% were currently on treatment (potential treatment gap 64.5%). A total of 14,076 fractures were classified as fragility fractures; a code enabling patients with such fractures to be included in the osteoporosis register for Quality Outcomes Framework reimbursement was missing in 64% (53% in over 75 s, 76% in 50 to 74-year-olds). DXA scans, recommended in high risk individuals between 50–75 y, were only coded in 32% of such cases. Overall, treatment initiation was recommended for 60% of those not on treatment, with oral bisphosphonates as the preferred choice (72%).
Conclusion: This combined approach identifies and corrects major deficiencies in osteoporosis management in primary care. Developments need to address improved digital systems for identification and risk assessment, as well as models of workforce planning to achieve maximum reductions in the primary care osteoporosis treatment gap.

P1185
COMPARATIVE EFFECTS OF VITAMIN D SUPPLEMENTATION ON SERUM CALCIOTROPIC PROFILES IN ORTHODOX NUNS WITH HYPOVITAMINOSIS D IN DIFFERENT REGIONS OF GREECE, VERSUS INTERMITTENT FASTING AND WESTERN DIET IN LAY WOMEN

S. Karras[1], N. Georgopoulos[2], M. Anemoulis[1], A. Vlastos[1], S. Pilz[3], M. Hewison[4]

[1]Thessaloniki, Aristotle Univ. Medical School, Thessaloniki, Greece, [2]Medical Univ. Patra, Patra, Greece, [3]Medical Univ. Graz, Graz, Austria, [4]Medical Univ., Birmingham, UK

Objective: Greek Orthodox monasteries due to their sartorial habits, comprise a population with high prevalence of hypovitaminosis D. Intermittent religious fasting is adopted by this population, as well as from a large part of general lay Greek population. Comparative effects of vitamin D supplementation and intermittent fasting on vitamin D equilibrium and calciotropic profiles remain scarce. We aimed to comparatively evaluate effects of vitamin D supplementation in two different forms (drops and pills at 2.500 IU daily) in Orthodox nuns from different regions of Greece, vs. Orthodox fasting and Western diet patterns in women from general population on vitamin D and calcium homeostasis.
Methods: Two groups of 25 women from two Orthodox monasteries in Northern Greece (Groups A and B) and two groups of 25 healthy women (Groups C and D) were included. During enrollment a detailed recording of demographic, dietary habits and anthropometric characteristics (via bioimpedance) was conducted. We evaluated calciotropic profiles [Calcium-Ca, Albumin, PTH, 25(OH)D] at baseline and after 12 weeks. Groups A and B received vitamin D supplementation with 2.500 international units of cholecalciferol daily (in the form of drops—Group A; and tablets—Group B). Groups C and D adopted a dietary pattern of Orthodox intermittent fasting [daily feeding window (10 am-6 pm)] (Group C) and a diet based on the recommendations of the American Heart Association (AHA) for the management of overweight and obesity in adults (Group D).
Results: All groups were comparable at baseline for calcium, PTH and 25(OH)D concentrations. All groups demonstrated significant increases of 25(OH)D [Group A (21.68 vs. 31.05 ng/ml),(Group B 25.78 vs. 38.35 ng/ml),(Group C 17.31 vs. 24.32 ng/ml), (Group D 17.62 vs. 24.12 ng/ml), with no significant between group differences. PTH concentrations decreased significantly in Group C (42.18 vs. 25.89) pg/ml and Group D (34.22 vs. 17.68) pg/ml, whereas PTH changes in groups A and B were non-significant after 12 weeks of supplementation compared to baseline, with no effects of anthropometric measures of body fat, as well as type of supplementation.
Conclusion: Intermittent fasting and AHA dietary patterns were equally effective with equal moderate doses of vitamin D supplementation in improving vitamin D status, in different groups of Greek nuns and lay women.

P1186
CLOSED STRAIGHTENING WITH MANIPULATION UNDER ANESTHESIA OF A BENDED TELESCOPING NAIL AFTER A FALL IN A CHILD WITH OSTEOGENESIS IMPERFECTA

S. Koliatzakis[1], D. Pafilas[1], C. Rossas[1], K. Vetsa[1], I. P. Papakammenos[1], L. Tsiopos[1]

[1]Orthopaedic Dept., General Hospital of Agrinio, Agrinio, Greece

Osteogenesis imperfecta is a genetic disorder characterized by reduced production of normal collagen type I, resulting in bone fragility. Telescopic intramedullary nails are usually applied in the fractured long bones of these children intended to strengthen, prevent future fractures and limit their axial deformations while allowing bone growth.

Case report: A 12-year-old child came to the emergency department due to a fall from a bicycle and an injury to the right thigh. The child was already diagnosed with osteogenesis imperfecta and had previously undergone intramedullary nailing to both his femurs (Fassier-Duval Telescopic IM System^{TM}) due to a fracture. The radiological examination revealed a fracture of the right femoral diaphysis with marked angulation and accompanying distortion of the intramedullary nail and therefore it was suggested to the parents to undergo surgery to treat the fracture with replacement of the telescopic nail. However, since the telescoping nail is not readily available in our country and the replacement surgery could only be performed after long term scheduling we proposed and the parents agreed to another feasible option. We proceeded to sedate the child with an attempt to reduce the fracture in combination with straightening as much as possible of the telescopic shaft of the nail with the help of fluoroscopy, in order to restore the axis of the femur, stabilize it with cast and give time to the parents to decide and schedule for the definitive treatment. The radiological result after closed manipulation was satisfactory and the parents decided to treat the fracture conservatively with a cast, even though they were informed that the intramedullary telescopic nail most probably would no longer work and would not offer full protection. Finally, the fracture was healed to mild angulation and did not cause functional problems to the child.

Conclusion: Closed straightening of an angulated intramedullary telescopic nail with simultaneous reduction of the fracture can be a compromise treatment option when revision surgery cannot be readily performed and as long as the radiological result is satisfactory and may not cause future problems for the child with osteogenesis imperfecta.

P1187
BASILAR THUMB ARTHRITIS: LONG-TERM RESULTS OF TRAPEZIECTOMY AND SUSPENSIOPLASTY TECHNIQUE WITH MINI TIGHTROPE

S. Koliatzakis[1], D. Pafilas[1], C. Rossas[1], K. Vetsa[1], I. P. Papakammenos[1], L. Tsiopos[1]

[1]Orthopaedic Dept., General Hospital of Agrinio, Agrinio, Greece

Objective: The thumb carpometacarpal joint (CMCJ) osteoarthritis is a common problem in middle-aged and elderly adults, especially females. It's one of the most common sites of degenerative osteoarthritis in the upper limb and due to its profound importance on hand function affects the daily activities. Many different surgical techniques have been advocated, including first metacarpal osteotomy, trapeziectomy alone or combined with ligament reconstruction and tendon interposition (LRTI) or suspensioplasty, CMCJ arthroplasty and CMCJ arthrodesis. The purpose of our study was to investigate the long-term results of a surgical method including trapeziectomy and suspensioplasty with the use of Mini TightRope (Arthrex).

Methods: In our study we recruited 12 patients (10 females and 2 males) of mean age at surgery about 62 y. All of them suffered from basilar thumb arthritis of the dominant hand (11 right and 1 left) and underwent surgical treatment with the method of trapeziectomy and suspensioplasty to stabilise first metacarpal to the second and prevent first metacarpal subsidence and narrowing of trapezial space height. For the suspensioplasty technique a newer modification was used including a synthetic implant, the Mini TightRope (Arthrex) which is made from a fibre wire and two stainless steel buttons on either side of the metacarpals. We assessed the 12 patients at regular intervals of 3 months, 6 months, 1 y and 5 y postoperatively in terms of pain, functional outcomes and radiological imaging.

Results: All of the patients reported pain relief and overall satisfaction at about 6 months after surgery according to the VAS pain scale (from mean 8 preoperatively to 0 postoperatively). There was a significant improvement of power measurement parameters in terms of hand grip, tip pinch and key pinch power. In general, patients were very satisfied after surgery and regained functional range of motion of the first CMCJ at about 1 y postoperatively. Radiologically we noted no significant change in thumb opposition, but a slight subsidence of the first metacarpal at 1 y after surgery. Moreover, in terms of complications, one patient presented with features of transient neuropraxia of the dorsal radial sensory nerve immediately after the operation which resolved 4 months later.

Conclusion: Osteoarthritis of the thumb CMCJ is very common and exist a lot of alternative surgical treatment options. A minimally invasive surgery procedure including trapeziectomy and suspensioplasty with the use of Mini TightRope gives satisfactory results and limited complications.

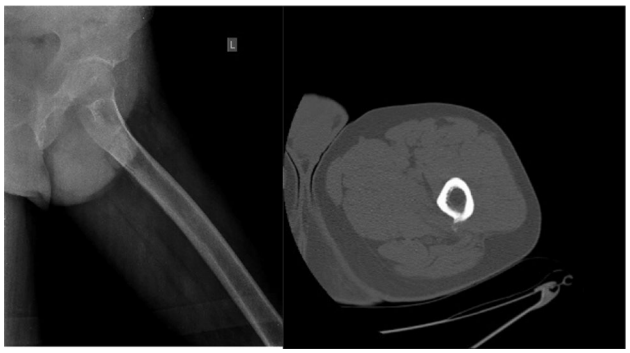
P1188
CALCIFICATION OF THE LINEA ASPERA: A RARE CLINICAL CASE

S. Koliatzakis[1], D. Pafilas[1], C. Rossas[1], K. Vetsa[1], I. P. Papakammenos[1], L. Tsiopos[1]

[1]Orthopaedic Dept., General Hospital of Agrinio, Agrinio, Greece

Calcification of the linea aspera of the femur is a relatively rare clinical case. If not diagnosed, it can lead to long-term suffering for the patient. The purpose of this paper is to present such an unusual clinical entity.

Case report: A 55-year-old male patient came to the emergency department of our hospital with pain on the posterior surface of the left thigh without any previous injury. Clinical examination revealed no evidence of sciatica or muscle strain and imaging was performed to rule out further pathology. A plain radiograph revealed a vaguely defined calcification at the insertion of the gluteus maximus on the posterior surface of the femur at the level of the linea aspera. Computed tomography imaging was then performed which confirmed the radiographic findings and better attributed the calcification to the gluteus maximus insertion. To further rule out pathology, an MRI and bone scan were performed with characteristic findings in the MRI. The patient was given pain-relieving treatment with anti-inflammatory and corticosteroids.



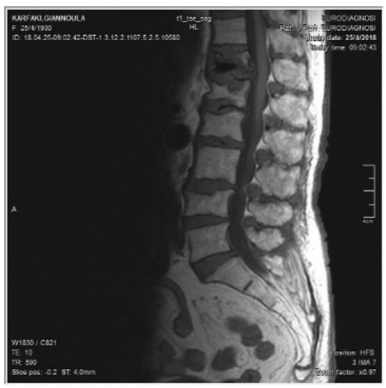
We do not have a clear record of when the patient's symptoms ameliorated. In the majority of cases, either the symptoms subside on their own or after a considerable period of time as occurs in any calcifying enthesopathy.
Conclusion: Calcification of linea aspera is a relatively rare condition that may distract the physician's attention as it may resemble a muscle contusion or sciatica.

P1189
KUMMELL'S DISEASE: A NOT SO RARE CASE THAT GOES UNNOTICED

S. Koliatzakis[1], D. Pafilas[1], C. Rossas[1], K. Vetsa[1], I. P. Papakammenos[1], L. Tsiopos[1]

[1]Orthopaedic Dept., General Hospital of Agrinio, Agrinio, Greece

The aim of this study is to present a case of osteonecrosis of the 12th vertebra body after a compression fracture.
Case report: An 88-year-old female patient presented to the emergency department due to a fall with pain in the thoracolumbar junction. Imaging revealed a T12 fracture. One month later, during a follow-up appointment, the patient was found to have osteonecrosis of the vertebra with intravertebral gas on computed tomography.



Discussion: Kummell's disease is osteonecrosis of the vertebral body after a compression fracture. The frequency of this finding is difficult to report precisely because many synonymous terms have been used to describe this pathology: posttraumatic vertebral osteonecrosis (AVN), vertebral compression fracture pseudoarthrosis (VCF nonunion), intervertebral space, cleft or gas, and delayed vertebral subsidence.
Conclusion: Kummell's disease is a potential complication in up to one third of vertebral fractures. Therefore, there is a fairly good chance that most primary care providers will at some point in their careers be involved in the treatment of a patient with Kummell's disease without perhaps knowing it.

P1190
SIGNIFICANCE OF EARLY REHABILITATION AND APPLICATION OF MYOFASCIAL MANIPULATION IN LUMBAR SYNDROME

S. Lazarevska[1], H. Lazarevska[1], O. Stojkovski[1], S. Mladenovski[2], V. Dimitrioski[3], D. Jovanovska-Jordanovski[3]

[1]Centre for Physical and Kinesitherapy—Laser Med, [2]Zan Mitrev Clinic, [3]PHI Polyclinic Jane Sandanski, Skopje, North Macedonia

Objective: Disability associated with chronic lumbar pain is one of the most common painful states of the modern human being and represents a benign condition with highest costs in the healthcare system. We aimed to detect the differences between the results from the treatment of patients with low lumbar pain, depending on the type of the applied methods of treatment: physical therapy and myofascial manipulation or medical treatment.
Methods: This study has enrolled 200 patients with low lumbar pain, treated with medical and physical therapy with myofascial manipulation that, according to the given therapy, were divided into two groups and examined before and after completion of the treatment. Oswestry Index was used for assessment of disability associated with lumbar pain.
Results: The respondents were with an average age of 53.8 y, most of who were female patients (62%) and had normal body weight, (BMI = 22.6). 34% of the respondents had a job position that mostly involves seating, whilst 48% of them had a job which does not require physical activity. T-test indicated nearly two times bigger drop of the disability index in patients who had received physical therapy with myofascial manipulation (28.8) in comparison with the drop of the disability index in patients who had received medical therapy (15.72), ($p < 0.05$).
Conclusion: The early practice of physical therapy with the application of myofascial manipulation and reduction of the longer period spent for resting bring better and quicker results for reduction of the disability associated with lumbar pain.

P1191
NOVEL SCREW-CABLE INTEGRATED SYSTEM (SCIS) FOR MINIMALLY INVASIVE TREATMENT OF PATELLA COMMINUTED FRACTURE: A FINITE ELEMENT ANALYSIS

S. Liu[1], Y. Liang[1], X. Wei[1]

[1]Orthopaedic Dept., Aerospace Center Hospital, Beijing, China

Objective: The most recommended method for treating comminuted patella fractures is modified tension band wiring (MTBW). However, the optical equipment used with MTBW remains yet to be determined. Hence, we designed a novel SCIS, which features cannulated screws and steel cables that can be freely disassembled or combined. This study aimed to compare the biomechanical characteristics of the MTBW with SCIS and cable-pin system in treating transverse patellar fracture.
Methods: A finite element (FE) model of comminuted patella fracture was created. The fracture model was fixed with either SCIS or cable-pin. Different tension force loading (400 N and 800 N), direction(0° and 45°) were set. Max contact pressure, contact area, maximum displacement of the fracture and maximum gap opening were measured by using FE analysis.

Results: Compared with cable-pin system, SCIS increased the stability of the fractured patella by reducing fragment displacement and gap opening while increasing the contact pressure and contract area. Under a 45°-400 N loading condition, the SCIS treatment method demonstrated a substantial improvement in stability metrics when compared to the Cable-pin system. The SCIS method reduced the maximum fragment displacement by approximately 23.68% (from 0.42 mm to 0.32 mm). Additionally, SCIS achieved a reduction in gap opening by approximately 30.23% (from 0.33 mm to 0.23 mm). The SCIS system exhibited a 26.06% increase in maximum contact pressure compared to the cable-pin system (from 2.70 Mpa to 3.40 Mpa). The SCIS system showed a 37.84% increased contact area compared to the cable-pin system (from 94.42 mm to 130.15 mm).
Conclusion: SCIS demonstrated improved biomechanical stability for treating comminuted patellar fractures compared to MTBW with cable-pin system. Finite element analysis showed SCIS substantially reduced fracture fragment displacement and gap opening while increasing maximum contact pressure and contact area under various loading conditions.

P1192
PREDICTIVE FACTORS FOR ASSESSING PHYSICAL PERFORMANCE AND FUNCTIONAL RECOVERY FOLLOWING FRAGILITY HIP FRACTURE SURGERY: A PROSPECTIVE COHORT STUDY

S. Luarngjindarat[1], P. Pinijprapa[2], W. Kanokwongnuwat[2], O.-A. Phruetthiphat[2]

[1]Rajavithi Hospital, [2]Phramongkutklao hospital, Bangkok, Thailand

Objective: Osteoporotic fractures are considered one of the burden issues for both patients and the health care system. Because they are often asymptomatic, osteoporotic vertebral compression fractures (OVCF) are among the most underdiagnosed fragility fractures. Hip fractures, the second most common fragility fracture, also inflict high mortality rates. In addition, the presence of OVCF alongside hip fractures worsens functional outcomes compared to those with only hip fractures. However, the incidence of combined fractures and their associated factors for short-term and mid-term functional outcomes are still unknown. The purpose of this study is to identify the associated risk factors affecting functional outcomes in both short-term and mid-term for patient with fragility hip fracture, either single or combined with OVCF.
Methods: After the Institutional Research Board approval, a prospective study was performed from April 2021 to June 2022. The inclusion criteria were patients over 60 years old diagnosed with femoral neck fracture or intertrochanteric fracture treated with either bipolar hemiarthroplasty or proximal femoral nail antirotation (PFNA) fixation, respectively. All patients were enrolled in the Fracture Liaison Service (FLS) care program. 81 patients were categorized into an isolated fragility hip fracture (isolated group) (n = 25, 30.9%) and a combined fracture with OVCF (combined group) (n = 56, 69.1%). Demographic data, including age, gender, BMI, comorbidity, the American Society of Anesthesiologists Classification (ASA class), and the Charlson comorbidity index (CCI) were collected at admission. BMD of the spine and hip were measured in all patients along with vertebral fracture assessment (VFA) for evaluating the incidence of combined OVCF. Additionally, OVCF severity was assessed using the Genant classification, and the number of OVCF levels was recorded. The physical performance was evaluated at short-term follow-up by using the timed up and go test (TUG) at 6 weeks, and the functional outcome at mid-term follow-up was assessed by the 1-y Harris Hip Score (HHS). The cutoff point of TUG was 18 s, with patients classified into good (≤ 18 s) and poor (> 18 s). Other associated risk factors were analyzed by univariate and multivariate regression methods for TUG and HHS.
Results: No significant differences in age, gender, BMI, comorbidity, ASA class, CCI, or the fracture types were observed between groups. Hip BMD and T-score of the spine were significantly lower in the combined group than in the isolated group (0.64 vs. 0.70 g/cm^2, p = 0.03; -1.68 vs. -0.84, p = 0.033, respectively). The most common OVCF occurred at the T12-L1 level and was mostly Genant grade 1 (n = 37, 45%). Female gender, advanced age (> 80 y), and intertrochanteric fracture were associated with poorer physical performance measured by the TUG test (P = 0.001, P = 0.008, and P = 0.04, respectively). Furthermore, advanced age (> 80 y) and hospital stay exceeding 7 d were significant prognostic risk factors for poor TUG test [odd ratio (OR) = 8.65, 95%CI 2.10–35.6, P = 0.003 and OR = 4.03, 95%CI 1.012–14.5, P = 0.033, respectively]. Similarly, female gender, advanced age, and combined OVCF were associated with significantly lower 1-y HHS (P = 0.047, P = 0.003, and P = 0.039, respectively). Conversely, other factors, including BMI, hip fracture pattern, and hospital stay duration, did not have a significant influence on the mid-term outcome.

Table 1 Demographic data

	Isolated hip fracture (n=25)	Combined hip fracture with OVCF (n=56)	p-value
Age (years), Mean ± SD	78.00 ± 9.61	79.05 ± 9.57	0.649‡
Gender, n (%)			0.122
Male	10 (40.00)	13 (23.21)	
Female	15 (60.00)	43 (76.79)	
BMI (kg/m^2), Mean ± SD	22.08 ± 3.63	22.63 ± 3.75	0.539‡
Calcium (mg/dL), Mean ± SD	8.99 ± 0.32	8.95 ± 0.49	0.703‡
Vitamin D (ng/ml), Mean ± SD	26.57 ± 9.71	26.2 ± 7.44	0.854‡
Time to surgery (days), Median (Min,Max)	3 (1,14)	4 (1,21)	0.120¥
BMD assessment			
Spine T-Score, Mean ± SD	**-0.84 ± 1.50**	**-1.68 ± 1.65**	**0.033‡**
Spine BMD (g/cm2), Mean ± SD	1.00 ± 0.19	0.92 ± 0.21	0.100‡
Hip T-Score, Mean ± SD	-2.14 ± 0.87	-2.45 ± 0.89	0.153‡
Hip BMD (g/cm2), Mean ± SD	**0.70 ± 0.13**	**0.64 ± 0.10**	**0.030‡**
Type of initial hip fracture, n (%)			0.181
Femoral neck fracture	19 (76.00)	34 (60.71)	
Intertrochanteric fracture	6 (24.00)	22 (39.29)	
ASA class, n (%)			0.364†
class I	3 (12.00)	2 (3.57)	
class II	16 (64.00)	40 (71.43)	
class III	6 (24.00)	14 (25.00)	

Chi-square test, †Fisher's exact test, ‡Independent t-test, ¥Mann-Whitney U test
Significant if p<0.05

Table 2 Compare outcomes between groups

	Isolated hip fracture (n=25)	Combined hip fracture with OVCF (n=56)	p-value
6-week Time up and go test (sec), Median (Min , Max)	**20.20 (9.30 , 65.00)**	**34.05 (11.70 , 82.90)**	**0.042¥**
1-year Harris hip score, Mean ± SD	**87.36 ± 7.06**	**82.02 ± 8.18**	**0.006‡**
Other outcomes			
Operative time (hours), Median (Min , Max)	1.00 (1.00 , 2.00)	1.50 (1.00 , 2.00)	0.693¥
Intraoperative blood loss (ml), Median (Min , Max)	100.00 (50.00 , 200.00)	100.00 (50.00 , 450.00)	0.164¥
Length of hospital stay (days), Median (Min , Max)	**7.00 (5.00 , 30.00)**	**11.00 (4.00 , 42.00)**	**0.022¥**

‡Independent t-test, ¥Mann-Whitney U test
Significant if p<0.05

Table 3 Univariable and Multivariable analysis for 1-year Harris Hip Score

	Unadjusted β (95%CI)	p-value	Adjusted β (95%CI)	p-value
Combined hip fracture with OVCF	-5.34 (-9.10 , -1.58)	0.006	-3.98 (-7.75 , -0.21)	0.039
age ≥ 80 years	-5.55 (-8.98 , -2.12)	0.002	-5.07 (-8.35 , -1.79)	0.003
Gender: Female	-4.84 (-8.73 , -0.94)	0.016	-3.81 (-7.56 , -0.06)	0.047
BMI	0.10 (-0.40 , 0.59)	0.700	0.08 (-0.37 , 0.53)	0.718
Intertrochanteric fracture	-2.00 (-5.81 , 1.81)	0.299	-1.20 (-4.74 , 2.34)	0.502
Length of hospital stay > 7 days	-3.84 (-7.69 , 0.01)	0.051	-1.28 (-5.06 , 2.49)	0.500

Multiple linear regression
Significant if p<0.05

Table 4 Univariable and Multivariable analysis for Time up and go test (sec)

	Unadjusted β (95%CI)	p-value	Adjusted β (95%CI)	p-value
Combined hip fracture with OVCF	9.47 (1.38 , 17.57)	0.022	5.13 (-2.38 , 12.63)	0.177
age ≥ 80 years	**13.71 (6.61 , 20.80)**	**<0.001**	**12.12 (5.60 , 18.63)**	**0.000**
Gender: Female	**11.68 (3.52 , 19.85)**	**0.006**	**10.15 (2.69 , 17.60)**	**0.008**
BMI	-0.55 (-1.59 , 0.49)	0.296	-0.49 (-1.38 , 0.39)	0.271
Intertrochanteric fracture	**8.60 (0.70 , 16.49)**	**0.033**	**7.38 (0.34 , 14.42)**	**0.040**
Length of hospital stay > 7 days	10.09 (2.03 , 18.15)	0.015	4.35 (-3.15 , 11.85)	0.252

Multiple linear regression
Significant if p<0.05

Table 5 Univariable and Multivariable analysis for TUG ≥ 18 sec vs TUG < 18 sec

	Adjusted OR (95%CI)	p-value
Combined hip fracture with OVCF	1.16 (0.29 , 4.53)	0.835
age ≥ 80 years	**8.65 (2.10 , 35.6)**	**0.003**
Gender: Female	3.75 (0.94 , 14.88)	0.060
BMI	0.92 (0.78 , 1.09)	0.347
Intertrochanteric fracture	3.21 (0.70 , 14.73)	0.134
Length of hospital stay > 7 days	**4.03 (1.12 , 14.5)**	**0.033**

Multiple logistic regression
Significant if p<0.05

Conclusion: Our study identified various factors predicting poor short-term physical performance and mid-term functional outcome in both isolated and combined fragility hip fractures with OVCF. These prognostic factors necessitate tailoring post-operative care, including focused physical therapy, appropriate osteoporotic treatment, and comprehensive fall prevention strategies, to optimize functional outcomes. An intensive rehabilitation program may be particularly beneficial for patients in the combined group to enhance recovery.

P1193
ARTHROSCOPIC TREATMENT OF SYNOVIAL CHONDROMATOSIS IN PATIENT WITH DIAGNOSED ANKYLOSING SPONDYLITIS

S. Maglevaniy[1], E. Naryshkin[1], M. Makarov[1], A. Khramov[1], A. Shumilova[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Ankylosing spondylitis (AS) is a chronic inflammatory autoimmune disease that mainly affects spine and axial joints, causing pain and restriction of movement. Pathogenesis of AS remains unclear but immune cells and innate cytokines have been suggested to play crucial roles. Synovial chondromatosis is a rare synovial-derived metaplasia that comes from formation of cartilage nodules within the synovial connective tissue of the joint.

Case report: This presents the patient with diagnosed ankylosing spondylitis notes pain and swelling of the right knee joint. According to the patient, the injury occurred in 2021 with the following pain syndrome. MRI: pronounced synovitis and hypertrophy of the synovial tissue. Unevenly shaped level of fluid in upper parts of the knee. Consulted in the Orthopaedic Department where synovectomy was recommended and performed. Intraoperatively, a large number of small flake-like type (irregular shape), ring-shaped type (curved, ring-shaped or comma-shaped) was visualized and evacuated followed by biopsy. Synovial chondromatosis was diagnosed. The postoperative period proceeded without complications. Intake of DMARDs for ankylosing spondylitis was continued. Examination was within 3 and 6 months after operation and revealed 20 mm on VAS scale, no complaints of recurrent swelling and no restriction of movement.

Conclusion: Even with a diagnosed rheumatic disease, concomitant joint pathologies and nosologies can be identified. The combination of synovial chondromatosis and ankylosing spondylitis is extremely rare and practically does not meet in the literature. However, synovectomy, evacuation of free chondral bodies and continuation of therapy may help to prevent flares and relapses.

P1194
ANALYSIS OF FACTORS DETERMINING PROGNOSIS IN PATIENTS WITH HIP FRACTURE DURING THE COVID–19 PANDEMIC

T. Semenova[1], S. Mazurenko[1], I. Tuchin[1], O. Potanina[1]

[1]Saint Petersburg State Univ., Saint Petersburg, Russia

Objective: To analyze the prevailing risk factors that worsen the short-term prognosis in patients with low-energy hip fractures in two groups: with and without concomitant COVID-19 infection.

Methods: We examined 157 patients (116 women and 41 men) with hip fractures. The average age was 78.1 ± 26.5 y. 100 patients (69 women and 31 men; average age 78.2 ± 27.5 y) had concomitant COVID-19 infection. 57 patients with hip fractures (47 women and 10 men; average age 77.2 ± 24.5 y) were not infected. The Morse Fall scale and the physical activity scale were used to assess the risk of patients falling.

Results: In the group of patients with COVID-19 infection, surgical intervention was performed in 56 cases. 44 patients were not operated on due to the severity of COVID-19 infection, complicated by pneumonia. In this group, 25 patients died, of which 21 patients received conservative treatment and 4 patients—surgery. In the group of uninfected patients with hip fractures, 48 were operated, 9 patients received conservative treatment. In the group of uninfected patients, 3 patients died, two after surgery and one patient receiving conservative treatment. The duration of hospitalization in the two groups did not differ significantly. According to the Morse Fall scale, 94% of all patients had a high risk of falls, 6% had a low risk. The average score on the Morse scale was 96.94. Mortality in the group of infected patients was significantly higher. Timely surgical intervention improved survival in both groups. In addition, the prognosis of female patients with COVID-19 was better than that of men. In the group of uninfected patients, we found no differences in survival depending on gender. Survival in the group of infected patients depended on the severity of viral pneumonia and in both groups from physical activity before fractures.

Conclusion: During the COVID–19 pandemic, patients did not stop suffering from osteoporosis-related fractures. Low physical inactivity caused by self-isolation increased the risk of falls due to progressive sarcopenia, impaired coordination of movements. Low physical activity and COVID–19 infection worsened fracture outcomes.

P1195
ANALYSIS OF BONE MINERAL DENSITY IN PATIENTS WITH VARIOUS CAUSES OF CHRONIC KIDNEY DISEASE

S. Mazurenko[1], N. Khudyakova[1], O. Mazurenko[2], M. Shabalina[1]

[1]Saint Petersburg State Univ., [2]North-Western District Scientific and Clinical Center named after L. G. Sokolov, Federal Medical and Biological Agency, St. Petersburg, Russia

Objective: Evaluation of BMD by DXA proved its value to predict fracture risk in patient with chronic kidney disease stage 5 (CKD 5st) on dialysis and in kidney transplant recipients [1,2]. The purpose of this study was to analyze the influence of different causes of CKD on BMD.

Methods: We evaluated BMD in 609 patients (307 men and 302 women, middle age 43,9 ± 12,3) with CKD 5st. 179 patient before the start of renal replacement therapy (RRT), 337 patient on hemodialysis (HD), and 93 kidney transplant recipients. All patients

were divided on subgroups depending on the cause of CKD: diabetes mellitus (DM) types 1 and 2, arterial hypertension, chronic glomerulonephritis, polycystic kidney disease, congenital **a**nomalies of the urinary tract (CAUT)**, c**hronic tubulointerstitial nephritis, urolithiasis. The values of the Z-score were used to compare BMD in the subgroups.

Results: The performed analysis showed that in the groups of patients with CRF before the start of RRT and on HD, the lowest BMD values were noted in patients with CAUT and type 1 diabetes mellitus. The analysis of Z-scores of patients with the other renal diseases did not show a significant difference ($p > 0.05$). In the group of kidney transplant recipients, the highest BMD was found in patients with DM type 2. Statistically significant difference in BMD in subgroups with different causes of renal diseases was not revealed.

Conclusion: The most likely reason of the lowest BMD scores in subgroups of patients with CAUT and DM type 1 and patients before the start of RRT and patients on HD was the age, which in most patient did not reach the peak of bone mass at the onset of CKD.

References:

1. Mazurenko SO, et al. Nephrology (Saint-Petersburg) 2022;26:44 (In Russ.)

2. Mazurenko SO, et al. Nephrology (Saint-Petersburg) 2023;27:69 (In Russ.)

P1196
BONE MINERAL DENSITY IN WOMEN WITH PRIMARY GLOMERULONEPHRITIS WITHOUT RENAL FAILURE

D. Monova[1], M. Stambolova[2], S. Monov[3]

[1]Medical Univ.—Sofia, Medical Institute—MIA, [2]Medical Institute—MIA, [3]Medical Univ.—Sofia, Sofia, Bulgaria

Objective: To assess BMD and to identify factors predictive of reduced BMD and occurrence of fracture in women with primary chronic glomerulonephritis (GN).

Methods: Demographic, clinical data, BMD (lumbar spine and femoral neck), functional disability and fracture-related mortality were collected. BMD was measured by using a DXA in lumbar spine (L1-L4) and femoral neck. The diagnosis of GN was confirmed by renal biopsy. Variables evaluated were duration of GN, age, serum creatinine, proteinuria, postmenopausal status, current and cumulative corticosteroid dose, use of low-molecular-weight heparin and history of fracture. Fisher's Exact and Student's t-tests were used to evaluate differences between patients with and without low BMD. Logistic regression was used for multivariate analysis.

Results: 74 women with primary GN (minimal change nephrotic syndrome in 9,46%, focal segmental GN in 21,62%, membranous GN in 22,97%, IgA GN in 21,62%, diffuse mesangial GN without IgA in 2,7%, focal mesangial GN in 6,76%, membranoproliferative GN in 14,87%) without renal failure were studied. The mean age was $37{,}32 \pm 15{,}66$ y, the mean disease duration was $7{,}12 \pm 3{,}54$ y. 42 women (56,76%) had low BMD, of those 26 (61,90%) had osteoporosis, mean BMD in lumbar spine was $-\ 2{,}92 \pm 0{,}36$ and in femoral neck was $-\ 2{,}32 \pm 0{,}24$. In correlation analysis and in multiple regression models, there were correlations between BMD and longer duration of GN ($p < 0{,}005$), age ($p < 0{,}01$), postmenopausal status ($p < 0{,}02$), low BMI ($p < 0{,}01$), presence of internal organ involvement ($p < 0{,}05$), proteinuria ($p < 0{,}05$), duration of corticosteroid (GC) treatment ($p < 0{,}005$), cumulative GC dose ($p < 0{,}002$), family history of osteoporosis ($p < 0.05$). Four women with low BMD had a fracture, compared to 1 without low BMD. No significant correlation was found between BMD and other studied parameters.

Conclusion: Our data suggest that patients with GN are at risk of low BMD, especially when and other risk factors for osteoporosis are present. A number of clinically relevant factors (longer duration of GN, proteinuria, high daily GC dose) are associated with low BMD. Using the minimally effective dose and duration of GC should be considered where possible.

P1198
CALCIUM PYROPHOSPHATE DISEASE SECONDARY TO PERSISTENT HYPOMAGNESEMIA, WITH CO-EXISTENT GOUTY ARTHRITIS AND GENERALIZED OSTEOARTHRITIS IN AN ELDERLY FILIPINO FEMALE: A CASE REPORT

S. P. Go-Soco[1], E. G. Vista[1], E. Tan[1]

[1]St Luke's Medical Center-Global City, Taguig City, Philippines

Elderly patients are predisposed to degenerative osteoarthritis. Crystal-induced inflammatory arthropathies, however, may complicate osteoarthritis. Gouty arthritis is caused by supersaturation of uric acid crystals; whereas, calcium pyrophosphate deposition disease is a crystal deposition disease. Both are associated with metabolic derangements. It is common practice to distinguish between the two inflammatory arthritides. However, these two may co-exist, as rare as it may be.

Case report: We describe the case of an elderly Filipino female, known case of degenerative osteoarthritis affecting the hips, spine, and knees. She presented with severe bilateral knee pain. On physical examination, both knees were effused, warm and erythematous. Arthrocentesis was immediately performed. Ancillaries revealed mild leukocytosis, with elevated erythrocyte sedimentation rate of 91 mm/h. Serum uric acid levels were normal. On review, she had persistent hypomagnesemia for almost a year, attributed to poor nutritional status. Synovial fluid was grossly dark yellow in color. Fluid analysis showed a cell count of 88,000 cells/uL. Gram stain and culture showed no microorganism, septic arthritis was ruled out. Polarizing microscopy revealed the presence of two crystals. Negatively-birefringent needle-shaped crystals and positively-birefringent rhomboid-shaped crystals were visualized. The former is consistent with monosodium urate crystals, and the latter with calcium pyrophosphate crystals. She was started on colchicine and febuxostat, with resolution of symptoms.

Conclusion: This case highlights that although rare, two types of crystal-associated arthropathies may co-exist in one patient. Further studies are required to probe into its association with osteoarthritis.

P1199
SURGICAL OUTCOMES OF OSTEOPOROTIC VERTEBRAL FRACTURES IN THE THORACOLUMBAR AND LUMBAR SPINE: A MONOCENTRIC RETROSPECTIVE ANALYSIS

S. P. Silva[1], D. Estrela[2], A. Barcelos[1]

[1]Rheumatology Dept., Unidade Local de Saúde Região de Aveiro, [2]Orthopedics Dept., Unidade Local de Saúde Região de Aveiro, Aveiro, Portugal

Objective: Osteoporotic vertebral fractures (OVF) are one of the most common osteoporotic fractures, and some patients require surgical intervention. The literature commonly reports the outcomes of

surgical repair of OVF at the thoracolumbar junction. We aim to evaluate surgical outcomes of lumbar OVF.
Methods: We conducted a retrospective study of patients who underwent spinal fusion surgery for OVF with a neurological deficit between November 2021 and 2023. Demographics, comorbidities, postoperative complications were compared between patients with lower lumbar fracture (L3-5) and those with thoracolumbar junction fracture (T10-L2). Nonparametric tests were used with a p-value statistically significant of < 0.05.
Results: A total of 46 patients (83.5% women with a median age of 73.50 y) were included in this study. 35 (76.6%) and 11 (23.9%) patients had thoracolumbar and lumbar OVF, respectively. Of these, 21.7% were treated with kyphoplasty, while 78.3% with vertebroplasty. All procedures were done by posterior approach, and most vertebral fixations (73.9%) were in upper and lower levels, with a minimum of 2 and a maximum of 6 fusion levels. There was a low incidence of postoperative complications, with anemia being the most common one (37.0%), with no differences between groups. We found no differences between lumbar and thoracolumbar OVF, except for previous fragility fractures, which were more prevalent in patients with lumbar OVF (14.3 vs. 54.5%, p = 0.022). More patients with thoracolumbar OVF needed rehabilitation (27.5 vs. 18.2%) and analgesics (25.7 vs. 0.0%) after surgery, but it was not statistically significant. More patients with lumbar OVF were referred to an Osteoporosis appointment (31.4 vs. 81.8%, p = 0.011). However, no differences regarding anti-osteoporotic treatment were observed (31.4 vs. 54.5%, p = 0.456).
Conclusion: Surgical intervention for OVF was effective in patients with myelopathy or radiculopathy regardless of the surgical level. Orthopedists should pay attention to intensive preoperative care to prevent various adverse events.

P1200
PARENTERIC AND SUBCUTANEOUS OSTEOPOROSIS TREATMENT ARE ASSOCIATED WITH ADHERENCE IN A PORTUGUESE FRACTURE LIAISON SERVICE

S. P. Silva[1], M. C. Portelada[1], G. Costa[1], C. Mazeda[1], P. Vilas-Boas[1], S. F. Azevedo[1], C. P. Oliveira[1], C. Vilafanha[1], P. M. Teixeira[1], G. Eugénio[1], A. Barcelos[1]

[1]Rheumatology Dept., Unidade Local de Saúde Região de Aveiro, Aveiro, Portugal

Objective: Literature describes that only 12.1% of Portuguese patients who suffered a hip fracture initiates treatment and only 3.4% were persistent in a 24-month period[1]. With that, we aimed to evaluate treatment adherence in our Fracture Liaison Service (FLS) and predictors of its persistence.
Methods: This retrospective study included patients who suffered a fragility fracture between January 2019 to December 2022. OP treatment was started according to the Portuguese recommendations and adherence to treatment were reassessed over a 1-y period. Predictors of treatment adherence were assessed using a logistic regression, and a p value ≤ 0.05 was considered statistically significant.
Results: A total of 220 patients were included, of which 176 (80%) started osteoporosis (OP) treatment: 79.3% oral bisphosphonate, 10.7% denosumab and 10.1% intravenous bisphosphonate. 34 patients lost follow-up and 7 patients died. After 12 months of follow-up, 133 (74.7%) patients maintained therapy. Patients who discontinued treatment were older (75.97 ± 10.69 vs. 79.59 ± 8.80, p = 0.050), had more respiratory diseases (3.1 vs. 13.3%, p = 0.010), had fewer previous OP treatment (24.8 vs. 8.9%, p = 0.023) and had more secondary fractures (p = 0.010). Patients that maintained OP treatment received more parenteric/subcutaneous formula (25.8 vs. 6.8%, p = 0.008). We didn't find differences in independent status, early menopause, parental hip fracture, calcium consumption, other comorbidities, smoking and alcohol habits, corticotherapy, previous fractures, vitamin D levels, institutionalization, and mortality. Patients treated with parenteric/subcutaneous OP treatment were more likely to maintain treatment, after adjusted for age and sex (OR 4.319, 95% C.I. 1.128–16.540, p = 0.033). On the other hand, patients who had respiratory chronic diseases were less likely to maintain treatment (OR 0.208, 95% C.I. 0.045–0.962, p = 0.044). Age at fracture, male gender and previous OP treatment were not significant predictors of adherence. The most common reason for treatment discontinuation was treatment complexity and self-reported adverse events.
Conclusion: In our FLS, 80% of patients started OP treatment after a fragility fracture. After 1-y, 74.7% of patients were adherent to OP. We also observed that parenteric/subcutaneous OP treatment were predictors of adherence to OP treatment. We believe that the adoption of the FLS model, could lead to better OP outcomes. Studies with longer follow-up periods are needed to confirm these findings.
Reference: (1) Torre C, et al. Acta Reumatol Port. 2019;44:114.

P1201
COMPARATIVE ASSESSMENT OF SHORT-TERM RECOVERY AND FUNCTIONAL OUTCOMES IN ELDERLY PATIENTS UNDERGOING PFNA FIXATION FOR INTERTROCHANTERIC FRACTURES WITH AND WITHOUT CKD: A PROSPECTIVE COHORT STUDY

S. Paiboonrungroj[1], P. Pinijprapa[1], Y. Satravaha[2], O.-A. Phruetthiphat[1]

[1]Phramongkutklao hospital, [2]Orthodontic Dept., Mahidol Univ., Bangkok, Thailand

Objective: Osteoporotic hip fracture is becoming the world's major health issue as the majority of population ages. The fragility hip fracture has been shown to affect ambulatory status, quality of life, functional outcomes, mortality, resource and financial cost spent in health care system. Previous literatures demonstrated that older age, male gender, comorbidities such as liver diseases, chronic kidney disease (CKD), heart pathology and Charlson index more than 2 were associated with increased mortality. Acute kidney injury and advanced CKD in the intertrochanteric fracture were significantly associated with increased 1-y mortality, according to Kim and colleagues. In addition, Phruetthiphat et al. identified that an advanced stage CKD treated with PFNA fixation was associated with lower 1-y functional outcome and sepsis was more common in CKD stage 5. However, lack of evidence demonstrated a comparison of short-term recovery between CKD and non-CKD in elderly patients with intertrochanteric fractures treated by surgical fixation. The purpose of this study is to identify short term recover, and to compare functional outcome, complication, and mortality in both groups.
Methods: After Institutional Research Board Approval, patients over 60 years old who sustained intertrochanteric fractures with the 2018 AO/OTA type 31A1.3, 31A2.2, and 31A2.3 from low energy trauma underwent PFNA fixation were prospectively collected. All patients were categorized into 2 groups based on glomerular filtration rate (GFR): those patients without chronic kidney disease [GFR at least 60 ml/min] and those patients with CKD [GFR < 60 ml/min]. Patients' demography and comorbidities were reviewed in both groups. Koval

score was used for assessment the functional status at preoperative period, and postoperative period at 3 months, 6 months, and 1 y. 3 months, 6 months, and 1 y time up and go test (TUG) were used to identify the short term recover and physical performance. 3 months, 6 months, and 1-y functional outcome were evaluated by Harris hip score (HHS). Any complication and mortality rate were compared in both groups.

Results: This prospective study enrolled 69 participants, including 24 patients with CKD and 45 patients without CKD. There was no significant difference in length of stay, operative time and blood loss, fracture union, Koval scores, and HHS in both groups. However, the 6 months TUG in CKD group was significantly longer than the non-CKD group (41.6 vs. 32.8, p = 0.035), and almost statistical significance at 3 months (51.8 vs. 42.2, p = 0.05) between groups. In addition, the mortality rate of CKD group was significantly higher than the non-CKD group (20.8 vs. 2.2%, p = 0.017).

Table 1 Patients' Demography and Comorbidity

	CKD (n=24)		Non-CKD (n=45)		p-value
	n	%	n	%	
Age, Mean ± SD	24	84.75 ± 7.60	45	80.67 ± 8.09	0.045
Sex					0.982
male	9	37.50	17	37.78	
female	15	62.50	28	62.22	
Hypertension					0.213
N	6	25.00	18	40.00	
Y	18	75.00	27	60.00	
DM					0.145
N	16	66.67	37	82.22	
Y	8	33.33	8	17.78	
Body mass index (kg/m2), Mean ± SD	24	21.56 ± 2.59	45	21.37 ± 4.13	0.840
Preoperative ASA class					<0.001
1-2	9	37.50	36	80.00	
3-4	15	62.50	9	20.00	
CCI, Mean ± SD	24	5.21 ± 1.47	45	3.76 ± 0.98	<0.001
Koval score, Mean ± SD	24	2.12 ± 1.54	45	1.76 ± 1.33	0.303
AO/OTA					0.528
A1.3	6	25.00	10	22.22	
A2.2	12	50.00	28	62.22	
A2.3	3	12.50	5	11.11	
A3.1	0	0	1	2.22	
A3.2	2	8.33	1	2.22	
A3.3	1	4.17	0	0	
Hb, Mean ± SD	24	11.45 ± 5.77	45	11.64 ± 1.66	0.844
Hct, Mean ± SD	24	30.53 ± 5.44	45	34.87 ± 4.94	0.001
Vit D, Mean ± SD	24	30.61 ± 10.15	44	27.07 ± 12.85	0.248
Calcium level, Mean ± SD	24	9.13 ± 0.84	45	8.80 ± 0.37	0.026
PTH, Median (IQR)	22	66.65 (44.2 - 75.7)	43	54.5 (39.4 - 75.5)	0.308
Creatinine, Mean ± SD	24	1.44 ± 0.59	45	0.77 ± 0.2	<0.001

Table 2 Operative data, length of stay, complications, and mortality between CKD and Non-CKD

	CKD (n=24)		Non-CKD (n=45)		p-value
	n	%	n	%	
Post_Operative time, Median (IQR)	24	90(67 - 90)	45	90(60 - 90)	0.572
Post_Blood loss, Median (IQR)	24	100(100 - 100)	45	100(100 - 100)	0.944
Post_LOS, Median (IQR)	24	11(10 - 14.5)	45	11(9 - 13)	0.603
Post_Complication					0.221
congestive heart failure	1	4.17	1	2.22	
no	20	83.33	43	95.56	
pneumonia	1	4.17	0	0	
septicemia	1	4.17	1	2.22	
small bowe l obstruction	1	4.17	0	0	
Death					0.017
N	19	79.17	44	97.78	
Y	5	20.83	1	2.22	

Table 3: TUG, HHS, and Koval score between CKD and Non-CKD

	CKD (n=24)		Non-CKD (n=45)		p-value
	n	%	n	%	
At 3 mo					
Xray union					0.893
N	7	36.84	17	38.64	
Y	12	63.16	27	61.36	
HHS	19	76.53 ± 3.49	44	76.75 ± 4.19	0.839
TUG	19	51.77 ± 20.03	44	42.21 ± 16.21	0.050
Koval score	19	5.95 ± 0.23	44	5.89 ± 0.62	0.679
At 6 mo					
Xray union					NA
N	0	0	0	0	
Y	18	100.00	39	100.00	
HHS	18	78.61 ± 3.85	39	79.92 ± 4.62	0.300
TUG	18	41.57 ± 15.15	39	32.83 ± 13.78	0.035
Koval score	18	5.56 ± 0.86	39	5.21 ± 1.3	0.303
Xray union					
At 12 mo					
Xray union					NA
N	0	0	0	0	
Y	13	100.00	32	100.00	
HHS	13	82.23 ± 4.38	32	83.5 ± 5.21	0.443
TUG	13	34.81 ± 14.1	32	28.08 ± 13.14	0.134
Koval score	13	5.38 ± 0.96	32	4.91 ± 1.42	0.273

Conclusion: Previous studies demonstrated that those patients with CKD stage 5 were associated with the highest mortality rate and lower functional outcome compared with non-CKD patients. However, they defined this comparison retrospectively while our study defined this comparison prospectively reducing possible confounding factors. In addition, this study firstly demonstrated a comparison of physical performance by TUG in both groups. Those elderly patients with intertrochanteric fracture and CKD treated with PFNA were significantly associated with longer short-term recovery, and higher mortality rate. This vulnerable group requires more attention in rehabilitation program to optimize outcome. In addition, this information is valuable for counseling their families regarding the mortality rate.

P1202
UTILIZATION OF ANABOLIC AGENTS IN VERY HIGH-RISK GROUP OF OSTEOPOROSIS IN POSTMENOPAUSAL WOMEN IN MAJOR EUROPEAN COUNTRIES

S. Palacios[1], K. Briot[2], S. Gawande[3], M. Boolell[3]

[1]Clinica Palacios C. de Antonio Acuña, Madrid, Spain, [2]Rhumatologue, Paris, France, [3]Theramex, London, UK

Objective: The study evaluated the current clinical practice in management of osteoporosis who are at very high risk (VHR) in 5 major European countries.

Methods: 1475 patient record forms (PRF) from 148 doctors from five key countries mentioned below were reached out to collect data. All physicians, specialists using anabolic, needed to have minimum of 10 VHR postmenopausal osteoporotic patients and were interviewed for 20 min to review the PRF. VHR group were postmenopausal

woman with T-score <—2.5; plus, history of more than 1 prior vertebral or non-vertebral fracture and/or recent fracture within last 2 y and/or experienced fracture whilst on treatment, and/or corticoid steroid use and/or age above 65 y.

Results: Only 30–40% of VHR patients received anabolic therapies, as opposed to the more common oral bisphosphonates (BP) or denosumab. Denosumab was utilized in 25–35% of VHR patients. Only 25–50% of patients with hip fractures received anabolic treatments instead of anti-resorptive options. Teriparatide and denosumab were used as second choice of treatment after oral BP. Patients in whom anabolic was initiated the most common fracture type was vertebral fracture (30–60%) followed by non-vertebral fracture (20–40%).

Table 1. Treatment selection varied across countries.

Parameters	Course of treatment	UK	Germany	Spain	Italy	France
Specialist*		32	31	33	26	26
% Anabolic usage in VHR osteoporosis patients assessed PRF (n).	First line#	(n-130)	(n-182)	(n-140)	(n-143)	(n-159)
	Anabolic	24%	24%	35%	32%	39%
	Denosumab	10%	17%	27%	19%	6%
	Oral BP	46%	46%	32%	42%	27%
	Second line	(n-129)	(n-93)	(n-153)	(n-91)	(n-85)
	Anabolic	38%	38%	41%	51%	41%
	Denosumab	31%	44%	44%	41%	44%
	Oral BP	3%	6%	10%	4%	4%
	Third line		(n-30)	(n-37)	(n-26)	(n-15)
	Anabolic	(n-148)	74%	79%	65%	69%
	Denosumab	67%	20%	16%	35%	12%
	Oral BP	24%	-	3%	-	-
		2%				

* Rheumatologist/Orthopaedic surgeon/Endocrinologist and trauma specialist
\# Spain, Italy, and France initiate anabolic use earlier compared to Germany and the UK.

Conclusion: Study shows notable underutilization of anabolic use for osteoporosis in VHR group and are more frequently utilized as a secondary option and beyond, underscoring the necessity for aligning treatment guidelines.

P1203
BALNEOTHERAPY AND MUSCULOSKELETAL DISEASES: EXPERIENCE OF TUNISIAN DOCTORS

S. Rahmouni[1], R. Fejji[1], K. Zouaoui[1], M. Abbes[1], S. Boussid[1], S. Rekik[1], H. Sehli.[1]

[1]Rabta Hospital, Tunisa, Tunis, Tunisia

Objective: Balneotherapy (BT) represents an interesting treatment alternative commonly used as additional intervention in the management of musculoskeletal disorders (MSD)and pain management. Our study aims to examine the perception and experience of Tunisian doctors regarding the use and the effects of BT in medicine.

Methods: An online survey comprising 17-questions was conducted in January 2024 addressed to physicians who commonly manage patients with MSD: rheumatologists (RTO), orthopedic surgeons (OS), physical therapists (PT), and general practitioners (GP).

Results: We included 129 physicians (52 RTO, 31 OS, 9 PT,37 GP), with a M/F sex ratio of 0.53. The mean age of participants was 34.28 [25–62]. Among them, three were professors, 13 were associate professors, 15 hospital-university assistants, 25 were private practice physicians, and 73 were residents. In our study, 94.6% of the doctors worked in an urban setting with an average year of practice of 7.59 ± 8.3. 75 doctors (58%) prescribed BT at least once (< 5 times a year: 77%, [5–10]:17.6% and > 10 times a year in 5.4%. the prescription was upon patient request in 81.1% of times. The cost of this therapy was covered by the national health insurance fund (NHIF) in 89.2% of cases, by private insurance in 2.7% and by the patient in 8.1%. The main indications for BT prescriptions are summarized in the following Table:

Table 1. Indications for balneotherapy prescriptions:

Medical condition	Rate (%)
Chronic inflammatory rheumatism (remission) (CIR)rm	27
Chronic inflammatory rheumatism (relapse) (CIR)rp	5.4
Low back pain/sciatica (LBP)	79.7
Cervicobrachial neuralgia and cervical pain (CBN)	23
Osteoarthritis (OA)	77
Fibromyalgia (FM)	32.4
Rotator cuff pathology (RCP)	8.1
Osteoporosis (OP)	2.7
Algodystrophy (AD)	9.5
Calcaneal spur (CS)/ Osteoporotic fracture (OF)	0

Based on the experience of the included physicians, patients reported diverse outcomes: no effect (1.4%), a sense of well-being without symptom improvement (15.1%), partial symptom improvement (58.9%), and a spectacular improvement in symptoms (24.7%). The main reasons for not prescribing BT were lack of knowledge about this therapy (58%) and the lack of social security coverage for the patients (41%). 33 physicians (25.6%) reported that patients refused BT because of lack of means (67.5%) and difficulties accessing the thermal resorts (47.5%). Based on their experience, physicians reported better outcomes of BT in the following conditions: LBP (81.4%), OA (72.9), CBN (67.4%), and CIR rm (55%). However thermal therapy was also identified effective in CIR rp (10.9), OP (7%), SC (3.9%) and OF (1.6%).

Conclusion: Although on 58% of the interviewed physicians have prescribed BT, most of them reported a beneficial effect of this therapy in musculoskeletal diseases. The main reason of not prescribing BT were the lack of knowledge about this treatment. Thus, it is crucial to raise awareness among physicians about the benefits of BT and its use.

P1204
A RARE CAUSE OF MULTILEVEL SPONDYLODISCITIS: CALCIUM PYROPHOSPHATE DEPOSITION DISEASE

S. Rahmouni[1], J. Soua[1], K. Zouaoui[1], M. Abbes[1], S. Boussaid[1], S. Rekik[1], H. Sahli[1], M. Elleuch[1]

[1]Rheumatology Dept., Rabta Hospital, Tunis, Tunisia

Calcium pyrophosphate deposition crystal disease (CPPD) is a crystalline arthropathy due to the deposition of CPP crystal in the joints. Exceptionally, CPP deposition may occur in the intervertebral discs and may cause chronic CPP crystal arthritis revealed by chronic back pain.

Case report: A 52-year-old women with no medical history was referred to the Department of Rheumatology for the assessment of inflammatory back pain, which started one year ago. She also complained of left knee pain and right shoulder. The physical examination was normal except for lumbar spine stiffness. Radiography showed multilevel discitis with linear intradiscal calcification within the nucleus pulposis (Fig. 1). Radiographs of the knees and pelvis were normal. Lumbar CT scan showed osteosclerosis of the adjacent vertebral plates of the l1-l2 disc, erosive disc disease with intradiscal calcifications and an intradiscal void. Biological assessment did not reveal any abnormality. Calcium, PTH Magnesium, ferritin and ALP levels were normal. The diagnosis of CPPD was then confirmed and the patient was prescribed colchicine (1 mg daily) with a good clinical response.

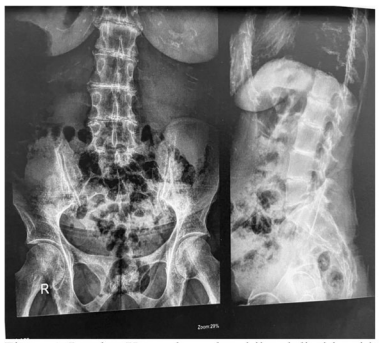


Figure 1. Lumbar X-ray showed multilevel discitis with linear intradiscal calcification within the nucleus pulposis

Conclusion: Spondylodiscitis can be due to non-infectious inflammatory spinal disorders or infectious diseases. The deposition of CPP in the spine is rare but should be considered in patients with back pain and peripheral joint symptoms.

P1205
PHYSICIANS' APPROACH TO PRESCRIBING THERMAL SPA TREATMENTS: INSIGHTS AND PRACTICES

R. Fejji[1], S. Rahmouni[1], K. Zouaoui[1], M. Abbes[1], S. Boussid[1], S. Rekik[1], H. Sehli[1]

[1]Rabta Hospital, Tunisa, Tunis, Tunisia

Objective: To assess the knowledge of physicians regarding the use of Spa therapy (ST) in musculoskeletal diseases.
Methods: In January 2024, we sent an 18-question survey via Google Forms, to physicians who commonly manage patients with MSD: rheumatologists (RTO), orthopedic surgeons (OS), physical therapists (PT), and general practitioners (GP).
Results: 129 physicians were enrolled (52 RTO, 31 OS, 9 PT, 37 GP). The average age of participants was 34.28 ± 8.86 y. Regarding the definition of ST, 33.3% considered it to be the same as crenotherapy, and 54.3% confused it with thalassotherapy and 61.2% with balneotherapy. Meanwhile, 20.2% of doctors expressed a lack of knowledge on this subject. When asked about the main indications for ST 96.1% reported rheumatic diseases, 61.2% neurological disorders, 45.7% ENT (Ear, Nose, and Throat) conditions, and 38% respiratory diseases. On the other hand, dentistry, gynecology, urology, psychiatry, and dermatology uses were reported by 3.9%, 20.2%, 20.2%,27.9%, and 28.7% of physicians, respectively. In our study, 22 doctors (17.1%) believed that a ST could be prescribed by a physiotherapist (wrong answer), 75.2% by a GP (correct answer) and 95.3% by a specialist (correct answer). The following Table summarizes the uses of ST in rheumatology.

Table 1. Indications for a ST according to the participants

Indication	Answer	Percentages
Osteoarthritis	RA	79.8
Low Back Pain	RA	88.4
Tendinopathy	RA	56.6
Inflammatory Rheumatism in Remission	RA	61.2
Fibromyalgia	RA	52.7
Osteoporosis	WA	9.3
Osteoporotic Fracture	WA	3.9
Calcaneal Spur	WA	2.9
Algodystrophy	RA	30.2
Osteomalacia	WA	4.7
Gout	WA	3.9
RA: right answer, WA: wrong answer		

Regarding the contraindications of ST, 86 patients had at least one wrong answer: pregnancy (47.3%), tendinopathy (2.3%), psoriasis (31.8%), tophaceous gout (7%), neoplasia in remission (0.8%), anticoagulant therapy (20.2%), asthma (13.2%). Regarding the average duration of a ST session, 41.1% had a good answer (18–21 d). Regarding the number of treatments per day: 21.1% of doctors believed that the maximum number of treatments allowed per day was 3, 19.5% thought it varied between 4 and 6 treatments (RA), 6.3% believed it was unlimited depending on the patient's desire, and finally, 53.1% of doctors were uncertain about the correct answer. The duration of each treatment was thought to be 1–2 h by: 8.5% of doctors, [30–60 min] by 37.2%, [10–15 min] (RA) by 4.7% and as long as the patient wants by 1.6% of doctors. While 48.1% of the participants did not know the answer.
Conclusion: Although the beneficial effect of ST on musculoskeletal diseases is well documented, our study revealed the lack of knowledge of specialist physicians RTO, OS, PT and GP regarding its use.

P1206
SPONDYLOARTHRITIS: DOES THE PROFILE OF THE PATIENT INFLUENCE VITAMIN D STATUS?

S. Rahmouni[1], R. Fejji[1], M. Mrad[2], K. Zouaoui[1], M. Abbes[1], S. Boussid[1], A. Bahlous[2], S. Rekik[1], H. Sehli[1]

[1]Rabta Hospital, Rheumatology Dept., [2]Pasteur institution, Biochemistry Dept., Tunis, Tunisia

Objective: To describe the prevalence of vitamin D deficiency in spondyloarthritis (SpA) and explore correlations between the clinical and biochemical parameters of the disease in these patients.
Methods: A cross-sectional study with prospective data collection involving 79 patients meeting ASAS criteria for SpA was conducted over a 2-y period. Sociodemographic data (age, gender, smoking), clinical information (disease duration, disease activity (BASDAI), and functional impact (BASFI)), as well as biological parameters (1–25 OH vitamin D levels, CRP), were collected. We referred to the Institute of Medicine (IOM) recommendations to define VitD status thresholds as follows: deficiency (< 20 ng/ml), insufficiency (20–29 ng/ml), and adequacy (30–44 ng/ml) [1].
Results: 79 patients, predominantly male (70.8%), were included with a M/F ratio of 2.43. The mean age was 46.3 ± 12.9. Active smoking was reported in 55.8% of cases. The mean disease duration was 12.5 ± 9.2 y. Extra-articular manifestations were present in 51 patients (60.5%), involving ocular, digestive, cutaneous, pulmonary, and bone manifestations in 13, 16, 5, 15, and 20 patients, respectively. The mean BASDAI and BASFI scores were 4.13 ± 2.11 [0.62–9.2] and 4.5 ± 2.25 [0.2–8.3], respectively. The mean CRP was 20.97 ± 24.1 mg/L. 65% of patients had vitamin D deficiency (25 (OH)D < 20 ng/ml) with an average vitamin D level of 17.7 ± 9.8 ng/ml. For the respective thresholds of 10, 20, and 30 ng/ml, the prevalence of 25(OH)D deficiency was 22.8%, 65%, and 94%, respectively. Vitamin D deficiency was significantly more common in females ($p = 0.032$) and in patients with a shorter disease duration ($p < 0.001$) and elevated CRP levels ($p = 0.021$). Additionally, no significant correlation was observed between vitamin D deficiency and BASDAI ($p = 0.472$), BASFI ($p = 0.876$), smoking ($p = 0.06$), and the presence of extra-articular manifestations.
Conclusion: Our study, consistent with existing literature, demonstrated an increased prevalence of vitamin D deficiency in SpA [2], particularly among females [3], those with a shorter disease duration [4], and those with elevated CRP levels [5].
References:

1. Holick MF, et al. J Clin Endocrinol Metab 2011;96:1911
2. Castro Corredor D, et al. Arch Osteoporos 2020;15:126
3. Erten S, et al. Intern Med Tokyo Jpn 2013;52:339
4. Zhao SZ, et al. Arch Rheumatol 2017;32:209

5. Cai G, et al. Clin Chim Acta Int J Clin Chem 2015;438:316

P1207
DO PHYSICIANS WHO PRESCRIBE THERMAL SPA HAVE THE BASIC KNOWLEDGE OF REIMBURSEMENT?

S. Rahmouni[1], R. Fejji[1], K. Zouaoui[1], M. Abbes[1], S. Boussid[1], S. Rekik[1], H. Sehli[1]

[1]Rabta Hospital, Rheumatology Dept., Tunis, Tunisia

Objective: To assess the knowledge of physicians regarding the reimbursement modalities of spa therapy (ST) in musculoskeletal diseases (MSD)concerning the care modalities endorsed by the National Health Insurance Fund (NHIF) and the associated reimbursement procedures.
Methods: An online survey of 17 questions was conducted in January 2024 addressed to physicians who commonly manage patients with MSD: rheumatologists (RTO), orthopedic surgeons (OS), physical therapists (PT), and general practitioners (GP). The survey was conducted using Google Forms.
Results: We enrolled 129 doctors comprising 52 (RTO), 31 (OS), 9 (PT), and 37 (GP), resulting in a M/F sex ratio of 0.53. The average age of participants was 34.28, ranging from 25–62 y. 75 doctors (58%) recommended ST with a prescription pattern as follows: 77%: less than 5 times a year, 17.6%: [5–10] times annually, and 5.4%: more than 10 times a year. At 58%, physicians refrained from prescribing ST due to a lack of knowledge about the procedure especially regarding the modalities of coverage by social security funds in Tunisia (69.8%). Regarding the question of the number of spa treatments reimbursed by the (NHIF) that a patient can have throughout their life (without going through the medical commission), only 27.9% had a right answer (twice in a lifetime) ($p < 10^{-3}$) and 38% did not know the answer. 22% of physicians knew that a patient aged over 55 could qualify for an automatic approval for a ST without going through the NHIF commission ($p \leq 10^{-3}$), while 51.9% had no idea on this subject. Only 17.1% of physicians knew that ST was reimbursable at the rate of 85% ($p = 0.033$), while 48.4% expressed having no knowledge about this. When asked about the recognized centers eligible for reimbursement, 9% of doctors had a right answer ($p = 0.54$).
Conclusion: Although physicians prescribed commonly ST, our study highlighted their lack of knowledge about the reimbursement modalities. Improving physicians' knowledge in this area is crucial in order to increase ST prescriptions, which ultimately lead to better patient care.

P1208
IMPLICATIONS OF BISPHOSPHONATE-ASSOCIATED SIDE EFFECTS ON TREATMENT ADHERENCE AND THERAPEUTIC EFFICACY

S. Rezgui[1], K. Maatallah[1], H. Ferjani[1], F. Majdoub[1], D. Ben Nessib[1], L. Kharrat[1], D. Kaffel[1], W. Hamdi[1]

[1]Mohamed Kassab Institute of Orthopedics, Tunis, Tunisia

Objective: Bisphosphonates, commonly prescribed to improve bone density and minimize fracture risk, have proven to be effective. Nevertheless, it is crucial to acknowledge the impact of potential side effects, as they play a noteworthy role in influencing the patient's overall experience and decision-making process. This study aimed to determine the side effects caused by bisphosphonates and their impact on treatment adherence and therapeutic efficacy.
Methods: A monocentric cross-sectional study was conducted, involving osteoporosis patients treated with bisphosphonates. Sociodemographic and clinical characteristics were collected. Patients were interviewed regarding the adverse effects of bisphosphonates and the reasons for discontinuing the treatment.
Results: A total of 100 patients were enrolled, comprising 13 men and 87 women, resulting in a sex ratio of 0.15. The mean age was 66 y ± 7.7 [42–85]. Among the participants, 29% had a rheumatic disease, and 17 were on regular steroid therapy. The mean BMD at the vertebral site was 0.781 ± 0.09 [0.563–0.922] g/cm^2, while at the femoral site, it was 0.580 ± 0.8 [0.016–1.150] g/cm^2. Alendronate was prescribed for 46 patients, risedronate for 43, and zoledronate for 11. Of these, 89 patients took the bisphosphonate orally. 24 patients (26%) reported adverse effects related to bisphosphonates, distributed as follows: flu-like syndrome (patients who had zoledronate IV infusion) in 21.7%, epigastralgia in 47.8%, a sense of digestive discomfort in 21.7%, and nausea in 8.7% of cases. The occurrence of adverse effects was not significantly associated with the presence of chronic inflammatory rheumatic disease ($p = 0.87$), the treatment duration ($p = 0.057$), or the treatment administration method (IV or orally) ($p = 0.76$). The bisphosphonates' adverse effects led to the discontinuation of treatment in 4 patients, including 2 on risedronate and 2 on alendronate. This discontinuation resulted in a height loss of 2 cm in one patient.
Conclusion: Side effects may affect the quality of life for individuals on bisphosphonates, potentially influencing their decision to continue treatment and, consequently, reducing the therapeutic effect of the medication.

P1209
A VIRTUAL ASSISTANT BASED ON A CHATBOT TO PROMOTE ADHERENCE TO EARLY POSTOPERATIVE REHABILITATION AND CLINICAL OUTCOME AFTER REVERSE SHOULDER ARTHROPLASTY

J.-M. José-María[1], S. Roig-Casasús[1], M. Navarro-Bosch[2], J.-E. Aroca-Navarro[2], D. David[1], P. Pau[1]

[1]Universitat de València, [2]Hospital Universitari i Politècnic La Fe de València, Valencia, Spain

Objective: There is no clear consensus on rehabilitation guidelines after reverse shoulder arthroplasty (RSA), but it is considered essential to an optimal return to daily functional activities or more complex activities such as sports practice. However low adherence to rehabilitation is one of the main barriers. The goal was to evaluate the effectiveness of using a chatbot in promoting adherence to home rehabilitation in patients undergoing RSA.
Methods: Randomized pilot trial with patients undergoing RSA. A control group received standard home rehabilitation, while the experimental group received the same intervention, but this was supervised by a virtual assistant who communicated with patients through a personal smartphone via an instant messaging application supervised with a chatbot. The interactions included messages to inform about the intervention, motivate, and remember the days and exercises for 12 weeks. Compliance with rehabilitation and clinical measures of shoulder function, pain, and quality of life were assessed. Data were analyzed with CI set at 95%.
Results: 31 patients (17 experimental, 14 control) average aged 70.4 (3.6) completed the intervention. Higher compliance to rehabilitation was achieved in the experimental than in the control group (77 vs. 65%; OR95% = 2.4 (0.5 to 11.4)). Participants evolved in time with significant benefits regarding shoulder function and shoulder disability, pain, and quality of life ($p < 0.001$). However, there was no significant increase in shoulder strength or mobility. Statistically significant between-group differences were found in the Quick DASH and self-reported quality of life. No differences were found in the rest of the measures.

Conclusion: A strategy to promote adherence to rehabilitation based on an automated chatbot promoted adherence with early postoperative home rehabilitation in patients undergoing RSA over standard care. Future trials can be oriented to determine the long-term effectiveness of the proposal.

Acknowledgement: This research was funded by the Agencia Estatal de Investigación (Spain), Project PID2020-115825RA-I00/AEI/ https://doi.org/10.13039/501100011033, Proyectos I + D + i 2020—Modalidades "Retos Investigación". The funder played no role on the design and conduct of the study.

P1210
EFFECT OF GENDER ON ACUTE AND SUBACUTE CHANGES IN ACHILLES TENDON ECHO INTENSITY INDUCED BY TRAINING: SOCCER AND HANDBALL TEAMS MICROCYCLE FOLLOW-UP

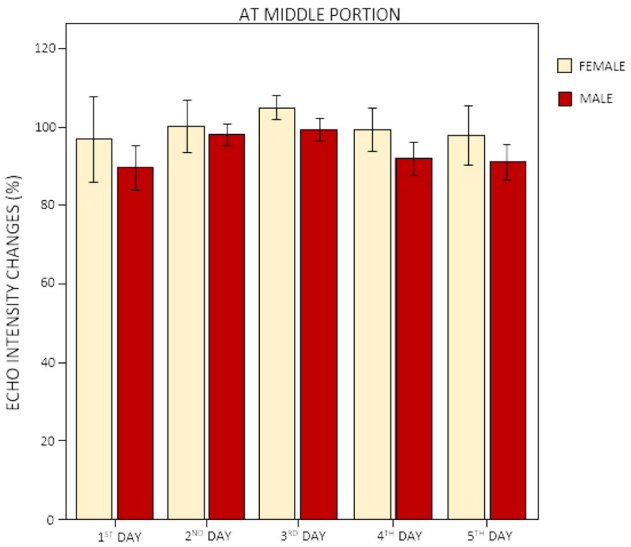
S. Salatkaite Urbone[1], D. Satkunskiene[1]

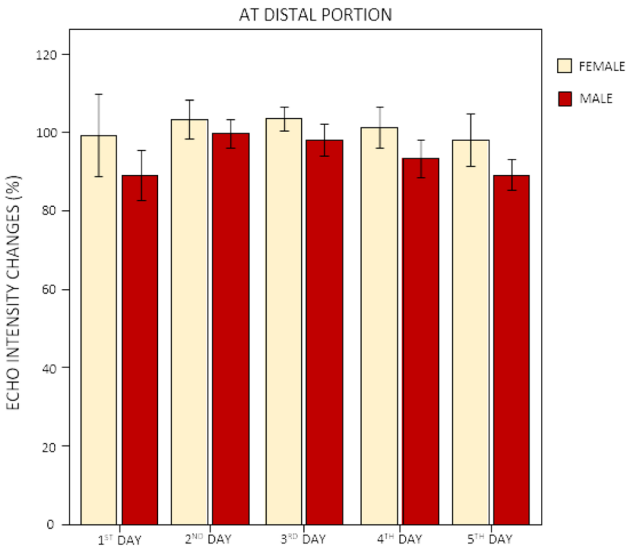
[1]Lithuanian Sports Univ., Kaunas, Lithuania

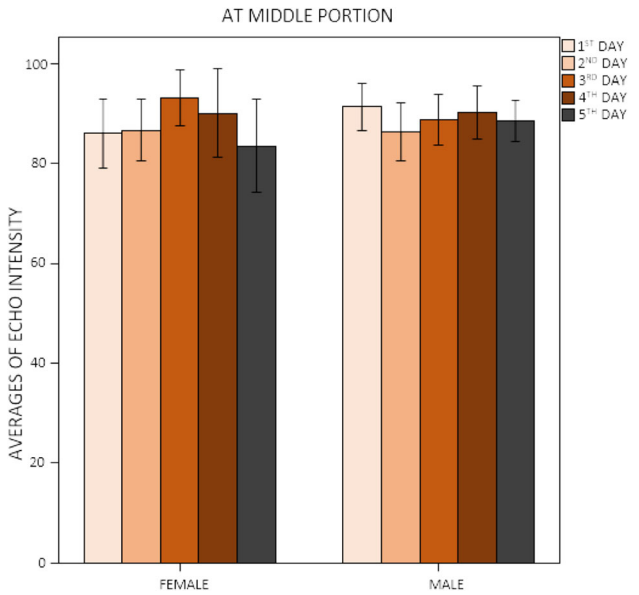
Objective: To investigate the effect of gender on Achilles tendon (AT) echo intensity (EI) acute and subacute changes induced by training during a one-week training cycle in professional soccer and handball players.

Methods: An ultrasound scanner, the Mindray Diagnostic Ultrasound System (Shenzen Mindray Bio-medical Electronics CO., LTD.), was used to collect a grayscale B-mode cross-sectional images of the AT proximal, middle, and distal portions. The study involved four professional male and female soccer and handball teams competing in the top leagues in Lithuania. Eight players from each team were tested before and after their training sessions for one week, starting on Monday and ending on Friday. All players were healthy and participated in all training sessions. The mean age, height, weight of female and male players were 23.31 ± 3.28 y, 1.68 ± 0.03 m, 61.44 ± 5.91 kg and 22.94 ± 4.27 y, 1.87 ± 0.05 m, 77.25 ± 7.72 kg respectively. This project has received funding from the Research Council of Lithuania (LMTLT), agreement No S-PD-22–27.

Results: Analysis of OMNI scale data showed that training intensity didn't change during the week ($F = 0.839$, $p = 0.503$). The acute effect had a significant impact on EI at all AT portions: proximal ($F = 18.038$, $p < 0.001$), middle ($F = 12.154$, $p = 0.002$) and distal ($F = 8.380$, $p = 0.007$). However, gender significantly interacted with acute effect only in the middle ($F = 7.052$, $p = 0.013$) and distal ($F = 9.503$, $p = 0.004$) AT portions. The subacute effect had a significant impact on the EI at the middle ($F = 3.736$, $p = 0.024$) and distal ($F = 3.929$, $p = 0.025$) AT portions, and gender significantly interacted with the subacute effect on the EI only at the middle AT portion ($F = 3.25$, $p = 0.038$). Also, the acute effect had a significant impact on the subacute effect at the proximal ($F = 4.890$, $p = 0.002$), middle ($F = 5.166$, $p = 0.005$) and distal ($F = 7.933$, $p < 0.001$) AT portions.







Conclusion: The impact of training sessions on echo intensity is significantly influenced by gender and varies depending on the portion of the Achilles tendon. For male players, echo intensity was significantly decreased at the middle and distal portions of the Achilles tendon in the acute phase. Conversely, female players experienced a greater effect on echo intensity at the middle portion of the Achilles tendon during the subacute phase.

P1211
SPECIAL FEATURES OF ANTIOXIDANT SYSTEM IN CARDIOVASCULAR MANIFESTATIONS OF SYSTEMIC SCLERODERMA

S. Spitsina[1], E. Mozgovaya[2], S. Bedina[1], A. Trofimenko[2]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd State Medical Univ., [2]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, Russia

Objective: To determine the activity of glutathionereductase (GR) in patients with systemic scleroderma (SSD) with manifestations of cardiovascular system damage.
Methods: 50 patients with systemic scleroderma (48 (96%) women and 2 (4%) men) were included in the study; their mean age was 50.7 ± 9.1 y, disease duration was 10.4 ± 8.3 y. Cardiac pathology was detected in 38 patients (76%), the rest had predominantly cutaneous-articular, pulmonary symptoms. The main manifestations of cardiovascular system damage were CHD (angina pectoris, cardiosclerosis, arrhythmias) in 24 patients (63%); arterial hypertension in 32 (84%); pericarditis in 2 (5%); valve disorders in 2 (5%). GR activity was determined according to the method of Hosoda and Nakamura, and the concentration of antibodies to GR was determined by enzyme immunoassay method using magnetosorbents (I.P. Gontar et al., 2002).
Results: According to the results of the study, the enzymatic activity of GR in patients with systemic scleroderma was significantly reduced, although no statistically significant differences depending on clinical symptoms were found. Also, an increase in the content of antibodies to GR was detected in 100% of scleroderma cases. However, their highest level was determined in patients with cardiovascular lesions ($p < 0.001$). Thus, decreased GR activity and synthesis of autoantibodies to GR are associated with increased risk of cardiovascular diseases.
Conclusion: In patients with systemic scleroderma with predominant cardiovascular lesions, antibodies to GR, which inhibit its antioxidant activity and are another factor in the development of atherosclerotic process, are detected significantly more often and in a higher value.

P1212
RELATION OF PAIN SYNDROME TO THE LEVEL OF PROINFLAMMATORY CYTOKINES IN PATIENTS WITH RHEUMATOID ARTHRITIS ON BASELINE THERAPY

S. Spitsina[1]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd State Medical Univ., Volgograd, Russia

Objective: To evaluate the dynamics of pain syndrome in patients with rheumatoid arthritis (RA) receiving combination therapy with methotrexate (MT) and infliximab (IF); to identify the relationship with the level of proinflammatory cytokines before and after the administration of combination therapy.
Methods: 18 patients with a diagnosis of RA verified according to ACR/EULAR 2010 qualifying criteria were included in the study. All patients received oral MT at a stable dose of 12.5–20 mg/week for 6 months or more, as well as various nonsteroidal anti-inflammatory drugs. 9 (50%) of the subjects received methylprednisolone 8 mg daily. 15 (66.7%) patients showed extra-articular manifestations in the form of mild anemia. Due to the persisting high activity of RA, patients were additionally prescribed IF (TNF-α inhibitor). The patients' condition was evaluated before IF administration (week 0) and at week 54 after combination therapy. IF was administered according to the standard regimen at a rate of 3 mg/kg body weight. RA activity was assessed using the DAS28-CRP(4) index. The patients' pain syndrome was assessed using the visual analogue scale (VAS) questionnaires for pain and disease activity assessment by the patient, HAQ and SF-36 at each of the indicated visits.
Results: The patients included in the study were female, with a mean age of 46 ± 8.4 y; with advanced and late stages of the disease. Patients had high activity of inflammatory process (DAS28-CRP(4) > 5.2); 2nd and 3rd functional class of joint failure. All patients showed a tendency of improvement of clinical manifestations by week 54 of combined MT + IF treatment: reduction of joint syndrome intensity, time of morning stiffness, pain and swelling of the affected joints, which was expressed in reduction of patient-defined VAS indices (on average, from 66.7 to 18.4 mm) and DAS28-CRP(4) (on average, from 5.5 to 3.03). Most patients showed improvement in quality of life parameters on the specialized HAQ questionnaire (from 1.4 ± 0.4 to 1.2 ± 0.21) and the general SF-36 questionnaire, especially with regard to the physical health score (from 34.3 ± 9.2 to 41.7 ± 6.5). Also, by week 54 of treatment, serum levels of measured pro-inflammatory cytokines decreased, which correlated with pain reduction. TNFα and IL-1 levels correlated directly with the VAS ($r = +0.45$ and $r = +0.23$, respectively) and HAQ ($r = +0.76$ and $r = +0.48$, respectively), inversely with the physical component of the SF-36 (r = -0.44 and r = -0.17, respectively).
Conclusion: Positive dynamics of clinical and laboratory parameters on the background of combined therapy of MT and IF was revealed: improvement of functional activity of joints, reduction of VAS of disease activity by the patient, improvement of performance of activities of daily living according to HAQ, improvement of general health according to SF-36. Correlation of the levels of

proinflammatory cytokines with the indicators characterizing the pain syndrome was noted.

P1213
ANTIBODIES TO ELASTIN AS A MARKER OF VASCULAR DAMAGE IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

S. Spitsina[1], E. Mozgovaya[2], S. Bedina[1], O. Emelyanova[2], O. Rusanova[2], A. Trofimenko[2]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd State Medical Univ., [2]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, Russia

Objective: To study the concentration of antibodies to elastin in patients with systemic lupus erythematosus (SLE), to reveal the correlation with cardiovascular manifestations of the disease, as well as a possible role as a marker.
Methods: The study included 45 patients diagnosed with SLE, the mean age of whom was 40.8 ± 12.4 y. The control group consisted of 30 conditionally healthy women, comparable in age. Moderate degree of activity was in 28 people (62%), low activity in 7 (16%), high in 10 (22%). According to the course of the disease: 8 (18%) patients had an acute course, 22 (49%) had a subacute course, and 15 (33%) had a chronic course. Patients had cutaneous-articular, pulmonary, neurologic, hematologic manifestations. Myocarditis with manifestations in the form of rhythm and conduction disorders, cardialgia, were found in 11 patients (24%). Mitral and aortic valve insufficiency lesions were detected in 9 patients (20%). Raynaud's syndrome, capillaritis, and vasculitis prevailed among the symptoms of vascular lesions (in 71% of cases). Determination of the content of antibodies to elastin was performed by indirect enzyme immunoassay using immobilized granular antigenic preparations with magnetic properties. The results were reported in optical density units (o.d.u.).
Results: Antibodies to elastin were detected in 58% of cases. No significant differences depending on age were found. At the same time, the concentration of antibodies to elastin was significantly higher in patients with acute course and high activity of SLE ($p < 0.05$). Depending on the clinical variants, it was found that the group of patients with vascular lesions had a more significant increase in antibodies to elastin ($p < 0.05$), in contrast to the group with valve and myocardial lesions ($p = 0.07$).
Conclusion: Increased synthesis of autoantibodies to elastin, as a component of the vascular wall, may be the cause of the development of systemic vasculopathy and a factor in the development of atherosclerosis and, as a consequence, cardiovascular pathologies, which makes it necessary to intensify not only the therapy of SLE to reduce the activity, but also the early prevention of cardiovascular accidents.

P1214
PREDICTORS FOR EXCELLENT OUTCOME AFTER HIP REPLACEMENT FOR ELDERLY FEMORAL NECK FRACTURE

O.-A. Phruetthiphat[1], S. Tatiyaworakulwong[1], P. Pinijprapa[1], P. Woratanarat[2]

[1]Phramongkutklao Hospital, [2]Ramathibodi Hospital, Bangkok, Thailand

Objective: In elderly patients with osteoporosis, femoral neck fracture is a common and debilitating injury, leading to significant loss of function and independence. Bipolar hemiarthroplasty (BHA) is a common surgical treatment for femoral neck fracture, with generally good outcomes. A systematic review and meta-analysis of fourteen randomized clinical trial demonstrated a comparison between BHA and THA, showing THA was significantly associated with higher Harris hip score (HHS) and lower revision rate while BHA was associated with shorter operative time and lower dislocation rate (1–2). In addition, a comparison between cemented and cementless BHA for femoral neck fracture in elderly patients showed that the cementless BHA had higher HHS than the cemented BHA. In contrast, cementless BHA had significantly higher rate of periprosthetic fracture (3–4). Previous studies have focused either surgical parameters or medical factors on the outcome after hip replacement. However, there is a lack of evidence identifying both parameters prediction the outcome together. Thus, this study aims to determine the predictive factors associated with excellent outcome, as well as to develop an integrated scoring system to predict the outcome after hip replacement in elderly patients with a femoral neck fracture.
Methods: A retrospective study was conducted in our institute from January 2015 to December 2021. Elderly patients with low-energy femoral neck fractures who underwent BHA and at least a year of follow-up were included. Demographics, comorbidities including ASA class and Charlson comorbidity index (CCI), BMD, length of hospital stay (LOS), as well as surgical parameters of the patients were all evaluated. Patients were categorized based on their HHS at 1-y follow-up as having excellent or non-excellent outcomes. Regression analysis was used to identify the independent predictors for an excellent functional outcome (HHS at least 90). A new integrated scoring system (Integrate Scoring System in elderly patients with Isolated femoral neck fracture: $ISSI_{FN}$) was developed. Clinically relevant parameters and statistically significant factors were further included in the new scoring system.
Results: A total of 348 elderly patients who underwent BHA were included for regression analysis. Univariate analysis demonstrated that younger age ($p < 0.001$), lower ASA class ($p = 0.003$), higher GFR ($p = 0.002$), higher albumin ($p < 0.001$), higher hip BMD ($p = 0.007$), shorter length of hospital stay ($p = 0.002$) were significantly associated with excellent functional outcome after hip replacement. Multivariate analysis revealed that the following factors were significantly associated with an excellent outcome after BHA: age < 70 y, lower ASA class, CCI ≤ 5, GFR ≥ 60, hip BMD > -2.5, LOS ≤ 5 d, Dorr type A, cementless femoral stem, and collar type. The $ISSI_{FN}$ score ranged from 0–12 and the cut-off score of at least 6 was found to have the highest discriminatory power to determine the excellent functional outcome, achieving an area under the ROC curve of 0.757, with a sensitivity of 60% and a specificity of 75%.

Table 4 Multivariate analysis, and predictive score for excellent outcome

Factors	Adjusted OR* (95% CI)	P-value	Coefficient	Predictive Score
Age				
<70 years	4.91 (2.12-11.39)	**0.016**	1.59	**2**
≥70 years	1.00			0
ASA class				
I, II	1.34 (0.60-2.98)	0.276	0.29	**1**
III	1.00			0
CCI				
≤5	9.74 (4.00-23.71)	0.128	1.23	**2**
>5	1.00			0
Length of hospital stay				
≤5	3.43 (0.37-3.17)	0.122	1.39	**2**
>5	1.00			0
eGFR (ml/min)				
≥60	1.52 (0.48-1.33)	0.357	0.42	**1**
<60	1.00			0
Hip BMD				
> -2.5	2.08 (0.06-1.53)	0.070	0.73	**1**
≤ -2.5	1.00			0
Morphology of Proximal femur				
Dorr type A	1.72 (0.44-1.53)	0.276	0.54	**1**
Dorr type B, C	1.00			0
Type of femoral stem				
Cementless	1.94 (0.35-1.69)	0.200	0.66	**1**
Cemented	1.00			0
Collar	2.19 (1.11-2.68)	0.415	0.78	**1**
Collarless	1.00			0

ASA class: American society of anesthesiologist classification; CCI: Charlson comorbidity index; GFR: Glomerular filtration rate; BMD: Bone mineral density

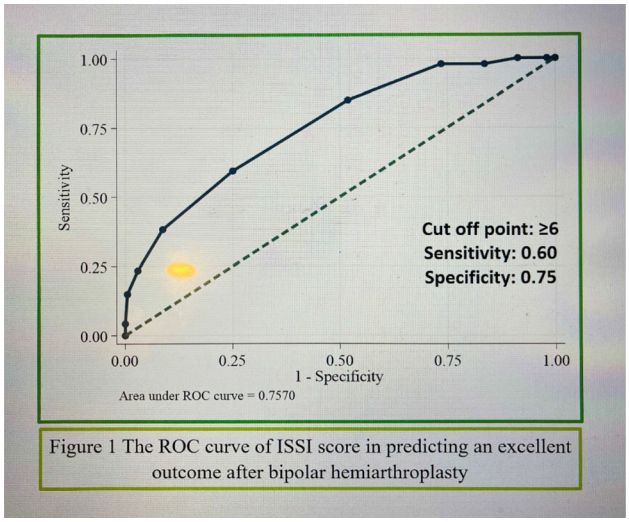


Figure 1 The ROC curve of ISSI score in predicting an excellent outcome after bipolar hemiarthroplasty

Conclusion: The $ISSI_{FN}$ score is effortless and practical for orthopedic surgeons for predicting excellent functional outcomes after hip replacement in elderly patients with an isolated femoral neck fracture. Those patients with non-excellent outcome at 2 weeks follow up in out-patient department should be required additional motivation and a more aggressive rehabilitation program for enhancing functional recovery.

References:

1. Danfeng Xu, et al. Int J Clin Exp Med 2018;11:5430
2. Lewis DP, et al. J Arthroplasty 2019;34:1837
3. Xinjie Wu, et al. Aging Clin Exp Res 2021;33:2087
4. Ellen L, et al. Clin Orthop Relat Res 2014;472:1291

P1215
A RARE CASE OF TUMOR-INDUCED OSTEOMALACIA CAUSED BY A DISTALLY LOCATED SOFT TISSUE GIANT CELL TUMOR

S. Tournis[1], M. Krikelis[2], M. Giannopoulou[2], V. Lainis[2], O. Katsouli[2], E. Mole[2], S. Gazi[2], E. Chronopoulos[1], A. Mavrogenis[3]

[1]Laboratory of Research of the Musculoskeletal System, Univ. of Athens, [2]Rheumatology Dept., KAT General Hospital, [3]First Dept. of Orthopaedics, National and Kapodistrian Univ. of Athens, School of Medicine, Athens, Greece

Tumor-induced osteomalacia (TIO) is a rare paraneoplastic syndrome of abnormal phosphate and vitamin D metabolism. It is typically associated with small mesenchymal benign tumors that secrete FGF23. This is a case report of a 54-year-old male patient diagnosed with TIO.

Case report: The patient complained of walking difficulty and muscle pains with a duration of seven months. Patient history included rib and pelvic fractures. Clinical examination revealed a Trendelenburg gait and muscle weakness mostly manifest in the pelvic girdle. No visible or palpable tumor-like lesions were found. Biochemical investigation revealed decreased phosphorus [1.3 mg/dl (2.3–4.7)], increased alkaline phosphatase [307 IU/l (50–116)], decreased 1,25 $(OH)_2$ vitamin D [< 10 pg/ml (18–80)] and a low tubular reabsorption of phosphorus (TRP) of 81%. Serum FGF23 was increased [193 kRU/l (26–110)]. The patient underwent whole-body PET/CT (68 Ga DOTATOC), which detected a round hypermetabolic lesion (SUVmax = 10) located in the soft tissues of the distal phalanx of the second left toe. After surgical excision, biopsy showed a giant cell tumor of soft tissue origin. Serum phosphorus normalized one day after excision, while five months post-excision FGF23 was normal [67 kRU/l (26–100)], along with normal phosphorus 3.8 mg/dl (2.3–4.7 mg/dl) and TRP of 91%.

Conclusion: Although typical, our TIO case is reportable because of the location and the rare histological type of the causal tumor. To our knowledge, only one similar case has been published so far.[1,2] The unusual location of our patient's causal tumor (the distal phalanx of the second left toe) underlines the importance of including the distal limbs in the PET/CT imaging.

References:

1. Harish S, et al. Clin Radiol 2008;63:101.
2. Folpe AL. Semin Diagn Pathol 2019;36:260.

P1216
WHAT CAN WE LEARN FROM THE WHATSAPP GROUP FOR PATIENTS WITH PREGNANCY AND LACTATION-INDUCED OSTEOPOROSIS?

S. Tuzun[1], E. Aygun[1]

[1]Dept. of Physical Medicine and Rehabilitation, Istanbul Univ.-Cerrahpasa, Cerrahpasa Medical Faculty, Istanbul, Turkey

Objective: Pregnancy and lactation-induced osteoporosis (PLO) is an uncommon type of osteoporosis that occurs early in life, resulting in mostly multiple vertebral fractures in young women. In this study, we aimed to expand the limited dataset regarding the etiology, clinical features, and risk factors by utilizing an alternative source of information via a WhatsApp group for patients.

Methods: 55 participants of a WhatsApp group called "Smile Please" diagnosed with PLO were invited to fill out a questionnaire covering four distinct sections: demographics, risk factors, diagnosis and treatment, and the impact of the patient group on their emotions related to the disease. The properties of the included subjects are

reported as mean ± SD or as the number of subjects and the percentage of responders to a particular question.
Results: 46 participants completed the survey within a 10-d period. The average age was 33.8 ± 4.8 y, with a mean BMI of 23.2. 37 women (80.4%) reported fractures, predominantly vertebral fractures (97.3%) with back pain, except for one hip fracture. Conditions most commonly reported as risk factors included smoking, physical inactivity, low weight gain during pregnancy, vitamin D deficiency, family history of osteoporosis, and the use of anticoagulants during pregnancy. 42 patients (91.3%) used vitamin D, and 29 (63%) took calcium supplements. 39.1% of patients were never treated with anti-osteoporotic medication. The distribution of anti-osteoporotic medications was as follows: teriparatide for 42.9%, oral bisphosphonates for 35.7%, denosumab for 32.1%, and parenteral bisphosphonates for 10.7%. Patients indicated that joining this group increased their knowledge about symptoms (46.3%), diagnostic methods (46.3%), treatment options (75.6%), side effects (41.5%), and prognosis (75.6%). Following membership, 50% of the patients reported a decrease in their fears related to the disease, and 41.9% expressed a reduction in concerns about treatment side effects.
Conclusion: PLO is a serious condition that leads to multiple fractures in young women. Given the rarity and obscurity of this condition, patient groups on social media platforms like WhatsApp can play a crucial role in rapidly and comprehensively collecting information about the disease's characteristics and its risk factors.

P1217
ABILITY OF FRACTURE RISK ASSESSMET TOOL (FRAX) TO IDENTIFY SUBJECTS WITH HIGHER FRACTURE RISK ASSESSED WITH RADIOFREQUENCY ECHOGRAPHIC MULTISPECTROMETRY (REMS)

S. Vladeva[1], F. Bischoff[2], E. Bischoff[3], P. Kinov[4]

[1]Trakia Univ., Medical Faculty, Stara Zagora, [2]Rheumatology practice, Stara Zagora, [3]Univ. "Prof. Dr. Assen Zlatarov"-Burgas, Medical Faculty, Burgas, [4]Univ. Hospital "Queen Giovanna", Dept. of Orthopaedics, Medical Univ. of Sofia, Sofia, Bulgaria

Objective: According to FRAX 10-y probability of a major osteoporosis-related fracture (MOF) ≥ 20% was considered as high fracture risk and is important to decide if the subject will take any medications. Cutoff value of REMS-based fragility score (FS) of 37.2 of the lumbar spine was demonstrated as REMS-based indicator for MOF at 5 y in the female population.
Methods: We assessed 72 women with mean age of 62 y with FRAX without inclusion of BMD. Age, height, weight, BMI, menopausal status, previous fractures, parental hip fractures, current smoking, use of glucocorticosteroids (CS), diagnosis of rheumatoid arthritis (RA), secondary osteoporosis and alcohol consumption were analyzed as part of FRAX questionnaire before the scan with REMS. Subsequently assessment of the fragility score of the lumbar spine with REMS was conducted by those with high fracture risk to prove the ability of FRAX to identify subjects with higher fracture risk. The data collection from the electronic health record was done with an innovative JAVA tool, developed by Kirilov et al. [1,2].
Results: The mean height of the women was 158 ± 9 cm and the mean weight was 70.5 ± 15.5 kg. The mean BMI was 28.4 ± 5.9 kg/m^2. Of 72 women, 34 women (47,2%) had 10-y probability of a MOF ≥ 20% and were assessed with REMS. Of total 34 subjects 27 subjects (79.4%) demonstrated REMS-based FS > 37.2.
Conclusion: FRAX tool showed a great ability to identify subjects with higher fracture risk assessed with REMS.
References:
1. Kirilov N, et al. GMS Publishing House 2023, DocAbstr. 66. https://doi.org/10.3205/23gmds105.
2. Kirilov N. 2020 Industrial Technologies 7, Vol 1, 80–83.

P1218
OUTCOME OF PATIENTS WITH VERTEBRAL FRAGILITY FRACTURES: A 7-YEAR EXPERIENCE OF A FRACTURE LIAISON SERVICE (FLS)

B. W. T. Yung[1], R. M. Y. Wong[2], W. W. Chau[2], S. Y. Ko[2], S. W. Law[2]

[1]Alice Ho Miu Ling Nethersole Hospital, Tai Po, [2]Chinese Univ. of Hong Kong, Shatin, Hong Kong SAR China

Objective: Hip fractures are one of the most serious forms of osteoporotic fractures. Osteosarcopenia is a growing geriatric giant that has higher risk of falls, fractures, disability and mortality. Given the importance of osteosarcopenia and treatments, the objective of this study was to determine the prevalence and risk factors of osteosarcopenia amongst Chinese hip fracture patients.
Methods: To determine the presence of osteoporosis and osteopenia, all recruited hip fracture patients underwent a DXA scan. To determine presence of sarcopenia, the Asian Working Group for Sarcopenia (AWGS) 2019 consensus update was used. Patients received a bioimpedance analysis (BIA) measurement to determine appendicular skeletal muscle mass (ASM), hand grip to determine muscle strength and 5-time chair stand test for physical performance. Patients were defined to have osteosarcopenia when there was both a presence of osteopenia/osteoporosis and sarcopenia. Patient demographics, hip fracture type, operation type were analysed as risk factors for osteosarcopenia with logistic regression.
Results: 229 hip fracture patients (N = 229) were recruited. The diagnosis of sarcopenia based on the AWGS 2019 consensus update was present in 208 hip fracture patients (90.8%). 224 hip fracture patients (97.8%) had osteopenia/osteoporosis. The combination of low BMD (osteopenia/osteoporosis) and sarcopenia was present in 203 hip fracture patients (88.6%). Age, and BMI < 23 kg/m^2 were associated with osteosarcopenia, whilst higher body weight and BMI were protective factors. Different fracture types were not associated with osteosarcopenia.
Conclusion: Our study has shown a very high prevalence of osteosarcopenia amongst hip fracture patients, and identified associated risk and protective factors. Given the potential clinical implications, we would recommend that routine sarcopenia assessment be incorporated into Fracture Liaison Services. Further research should be conducted on optimal body weight and BMI.

P1219
IMPACT OF TRANSITIONING ANTI-OSTEOPOROSIS MEDICATIONS IN TAIWAN ON THE PERSISTENCE OF OSTEOPOROSIS TREATMENT

S. Y. Lin[1], K. Kang[2], C. H. Chen[3]

[1]1Dept. of Orthopaedics, Kaohsiung Medical Univ. Hospital, Kaohsiung Medical Univ., Orthopaedic Research Center, Kaohsiung Medical Univ., Kaohsiung, [2]Dept. of Obstetrics and Gynecology, National Cheng Kung Univ. Hospital, College of Medicine, National Cheng Kung Univ., Tainan, [3]Orthopaedic research center, Kaohsiung Medical Univ., Dept. of Orthopaedics, Kaohsiung Municipal Ta-Tung Hospital, Kaohsiung Medical Univ., Kaohsiung, Taiwan

Objective: Osteoporosis treatment success hinges on long-term anti-osteoporosis medication (AOM) persistence, crucial for reducing overall fracture risk. Various AOMs are available for selection, and regimen switching is very common in real-world clinical scenarios. Previous studies have primarily focused on the persistence of AOMs

prescribed initially and considered drug switching as treatment discontinuation, overlooking the common occurrence of switching in real-world clinical practice. Current research emphasizes the impact of initial medication on switching behavior and overall persistence in osteoporosis patients, aiming to provide a comprehensive understanding.

Methods: Utilizing Taiwan's National Health Insurance claims data in an observational retrospective cohort study, we focused on patients initiating anti-osteoporosis medication (AOM) between January 1, 2013, and June 30, 2016. AOMs included alendronate, raloxifene, teriparatide, denosumab, zoledronate, and ibandronate. Persistence, defined as continuous prescription with a 45-d grace period, was assessed using a competing risk model to understand factors influencing initial AOM switching.

Results: Among 126,539 patients (mean age 75 y, 85% female), alendronate, denosumab, raloxifene, zoledronate, ibandronate, and teriparatide were initially prescribed to 43.3%, 25.6%, 14.6%, 9.3%, 5.3%, and 1.9% of patients, respectively. Over a mean 36-month follow-up, 29.6% of patients with at least two AOM claims switched medications, favoring long-dose-interval medications like denosumab and zoledronate.

Conclusion: This study recommends incorporating long-dose-interval therapy as initial treatment or during the first switch stage to enhance treatment persistence. The findings underscore the importance of considering medication switching in real-world clinical practice for a more nuanced understanding of osteoporosis treatment outcomes.

P1220
SEX DIFFERENCES IN OLDEST-OLD ADULTS WITH HIP FRACTURE SURGERY

S. Y. Lin[1], C. F. Lin[2], K. H. Chen[3]

[1]Center for Geriatrics and Gerontology, Taichung Veterans General Hospital, [2]Center for Geriatrics and Gerontology, Taichung Veterans General Hospital, [3]Dept. of Orthopedic Surgery, Taichung Veterans General Hospital, Taichung, Taiwan

Objective: As the population ages, there is a noticeable rise in the occurrence of hip fractures among the older adults. The unique challenges presented by hip fractures may provide the chance of understanding gender disparities in surgical outcomes and tailoring healthcare more effectively. This study aimed to study the distinctions in clinical presentation and post-surgery outcomes based on gender after hip fractures.

Methods: The retrospective study was conducted at a medical center in central Taiwan from January 01, 2018, to December 31, 2023. We enrolled 181 oldest-old adults, aged 85 and older, who underwent hip fracture surgery, and were followed for one year. Comprehensive documentation of sociodemographic information, clinical data, perioperative assessments, and surgical outcomes was carried out. Statistical analyses, including the Mann–Whitney U test, Kruskal–Wallis test, and the chi-square test, were utilized to evaluate gender-based group differences.

Results: In total, 81 patients were male, and 100 were female; their median age was 89.0 (interquartile range (IQR): 97.0–91.5) y. The length of stay was 8.0 (IQR: 6.0–10.0) d, and 33 patients died during the 1-y period. There was no sex difference in sociodemographic information, clinical data, perioperative assessments, and surgical outcomes, except for postoperative Harris hip score. In the postoperative assessment of the Harris hip score, sex differences were observed in limp, sitting, and absence of deformity with male patients better than female patients, but these differences did not reach statistical significance.

Conclusion: Both male and female oldest old adults with hip fractures surgery may experience declines in functional status. However, the extent of recovery and functional outcomes may vary between the sexes. Understanding these patterns is crucial for optimizing care and improving outcomes for both men and women.

P1221
IS THERE A RELATIONSHIP BETWEEN INFLAMMATORY MARKERS, BONE MINERAL METABOLISM AND CORONARY ARTERY CALCIFICATION? PRELIMINARY DATA

K. A. Nichiporuk[1], B. B. Tymkiv[1], S. Y. U. Tsarenok[1], N. A. Ilyamakova[2], V. V. Gorbunov[1], M. P. Tereshkov[2], T. A. Aksenova[1]

[1]Chita State Medical Academy, [2]Clinical Hospital Russian Railways-Medicine of the city of Chita, Chita, Russia

Objective: Ectopic calcification of the coronary arteries from the clinical and prognosis perspective determines the relevance of the study of biomarkers that reflect the process of calcification and are indicators of the main mechanisms of development of this pathological process. In recent years, a concept has been formed that characterizes coronary calcification as an active process, which is based on a systemic inflammatory reaction, disorders of bone and mineral metabolism, etc. We aimed to determine the relationship between parameters of bone-mineral metabolism and C-reactive protein (CRP) with the severity of atherosclerosis of the coronary arteries and the degree of their calcification.

Methods: A total of 16 patients with coronary heart disease were included in the study, 7 women aged from 61–73 y (mean age 66.2 ± 4.34 y), and 9 men from 59–65 y (mean age 61.3 ± 2,54 years old). Of these, 11 people had stable angina pectoris, 5 patients with post-infarction cardiosclerosis. The study included only those patients in whom coronary angiography revealed a stenosis of 50% or more in at least one vessel. The patients were examined for serum levels of phosphorus, calcium, alkaline phosphatase, 25(OH) vitamin D3, CRP, X-ray densitometry of the femoral neck and lumbar vertebrae, multislice CT (MSCT) of the coronary arteries with calculation of the coronary calcium index according to Agatston, and 24-h monitoring blood pressure with assessment of central aortic pressure and arterial stiffness parameters. Statistical analysis was carried out using the Statistica 10.0 software package. Nonparametric criteria were used: Spearman's rank correlation test and γ-correlation. Differences were considered significant at $p < 0.05$.

Results: Among the 16 patients included in the study, 75% of patients had multivessel coronary artery disease, 12.5% had two- and single-vessel disease. According to the results of MSCT, signs of coronary artery calcification were revealed in all examined individuals: in 1 patient (6255) the calcification was of moderate severity, in 15 patients (93.75%) a severe degree of coronary artery calcification was established. When conducting a correlation analysis, no significant associations were established between the levels of total calcium and phosphorus in the blood and the degree of calcification of the coronary arteries. However, the highest calcium index (2762 HU) was recorded in 1 patient with the highest total blood calcium level (4.89 mmol/l). A negative relationship was established between the level of high-density lipoproteins and the severity of coronary artery calcification ($r = -0.545$, $p < 0.05$) and there was no relationship with the level of CRP. In addition, when studying such a parameter of vascular stiffness as the augmentation index, we identified a direct relationship between this indicator and the serum concentration of alkaline phosphatase ($r = -0.605$, $p < 0.05$) and an inverse relationship with the content of 25(OH)D3 ($r = -0.696$, $p < 0.05$).

We will continue our research in this direction as we are publishing only initial preliminary data. We think that in the process of further

research we will be able to provide more complete and interesting data on this issue.

Conclusion: It has been established that patients with coronary artery disease with coronary artery stenosis of 50% or more have a severe degree of calcification. There was no association between the level of CRP, parameters of bone-mineral metabolism and the degree of coronary artery calcification. A negative relationship has been established between the level of high-density lipoproteins and the severity of coronary artery calcification. Elevated alkaline phosphatase levels and low serum 25(OH)D3 levels are associated with increased vascular wall stiffness.

P1222
DEOXYCHOLIC ACID (DCA), A SECONDARY BILE ACID MITIGATES LPS INDUCED INFLAMMATORY BONE LOSS

S. Yadav[1], R. Srivastava[1]

[1]All India Institute of Medical Sciences, Delhi, India

Objective: Osteoporosis is an inflammatory bone loss disease characterized by lower BMD, and diminished bone strength which exacerbates fragility fractures. The role of gut microbiome in modulating bone health has already been established by our group along with others. However, the role of gut-associated metabolites such as secondary bile acids on bone health has not been fully explored. DCA is one of the major secondary bile acids produced by the gut microbiota. DCA acts as a ligand for FXR and TGR5 receptors which are highly represented on both innate immune cells and bone cells. Thus, it makes DCA a potential therapeutic candidate in inflammatory bone loss. In the present study we hypothesize to unravel the role of DCA on bone remodelling in LPS induced inflammatory bone loss model in mice.

Methods: For osteoclastogenesis, murine BM cells were cultured in the presence of RANKL and M-CSF for 4 d and characterized by TRAP staining. For osteoblastogenesis, BM cells were cultured for 14 and 21 d in osteogenic media and characterized by ALP and alizarine red staining respectively. For LPS-induced inflammatory bone loss model, mice (C57/BL6, male, 12 weeks) were randomly divided into three groups (Control, LPS and LPS + DCA). The LPS and LPS + DCA groups were intraperitoneally injected with LPS (5 mg/kg). DCA dissolved in drinking water was administered orally to the LPS + DCA group (1 mg/mouse) for 10 d. At day 11, mice were sacrificed and bone (μCT, BMD), SI/LI (histology), and BM (ex vivo culture for osteoclasts and osteoblasts, qPCR) were harvested and analysed.

Results: Interestingly we observed that DCA significantly enhanced osteoblastogenesis in a dose dependent manner while simultaneously inhibiting osteoclastogenesis. Our in vivo results further confirmed that DCA enhances bone health in LPS induced inflammatory bone loss model in mice. μCT assessment of both femur and tibia bones showed loss of bone microarchitecture in LPS treated mice compared with control and DCA treated groups. DCA supplementation significantly enhanced the BMD, bone volume per tissue volume, trabecular number, trabecular thickness and decreased trabecular separation. Moreover, our ex vivo osteoclast cultures from the bone marrow of DCA treated group reflected attenuated osteoclastogenesis with respect to LPS induced mice group. Altogether, both our in vitro and in vivo data clearly establish the therapeutic potential of DCA in enhancing bone health in LPS induced inflammatory bone loss.

Conclusion: Our results for the first time establish that DCA directly affects both bone forming (osteoblasts) and bone resorbing (osteoclasts) cells and ameliorates bone loss in LPS induced inflammatory bone loss model. The findings of our study offer a new avenue in harnessing the osteoprotective potential of DCA (a secondary bile acid) in improving bone health in various inflammatory bone pathologies including RA and osteoporosis.

P1223
EPIDEMIOLOGY OF FRACTURES IN ADULTS OF AFRICAN ANCESTRY WITH TYPE 1 AND TYPE 2 DIABETES MELLITUS: A SYSTEMATIC REVIEW AND META-ANALYSIS

S. Zhang[1], T. Makebeh[2], J. Mesinovic[1], C. Martin[3], L.-Y. Lui[4], P. Cawthon[4], A. Schneider[5], J. Zmuda[6], E. Strotmeyer[6], A. Schafer[7], P. Ebeling[1], R. Zebaze.[1]

[1]Dept. of Medicine, School of Clinical Sciences, Monash Univ., Melbourne, Australia, [2]ZEZE co, Yaoundé, Cameroon, [3]School of Public Health and Preventive Medicine, Monash Univ., Melbourne, Australia, [4]Research Institute, California Pacific Medical Center, San Francisco, USA, [5]Dept. of Biostatistics, Epidemiology, and Informatics, Univ. of Pennsylvania Perelman School of Medicine, Philadelphia, USA, [6]Dept. of Epidemiology, School of Public Health, Univ. of Pittsburgh, Pittsburgh, USA, [7]Endocrine Research Unit, San Francisco Veterans Affairs Health Care System, San Francisco, USA

Objective: Although bone disease is a major complication of diabetes mellitus (DM), little is known regarding the impact of DM on fractures in Black adults. This is the first systematic review and meta-analysis to investigate the association between DM and fractures in adults of African ancestry.

Methods: Relevant literature up to November 2023 was screened from databases including MEDLINE, Scopus, CINAHL and Embase. All studies assessing the epidemiology of fractures (prevalence, incidence, or risk) in Black men and women (age $\geq$ 18 y) with type 1 and type 2 DM were included. Effect sizes for prevalence of previous fractures (%) and incident fracture risk (hazard ratio [HR]) were calculated using a random-effects model. The Hartung-Knapp-Sidik-Jonkman method was employed to estimate the variance of the pooled effect in all meta-analyses with five or less studies.

Results: Among 13 eligible studies, 12 were conducted in Black adults from the USA, while one was conducted in adults of West African ancestry from Trinidad and Tobago. We found no fracture data in Black adults with DM living in Africa. Five studies were included in a meta-analysis for incident fracture risk, reporting data from 2926 Black adults with DM and 6553 White adults with DM. There was increased risk of fractures in Black adults with DM compared with non-DM (HR = 1.65; 95%CI: 1.14, 2.39). The risk of fractures observed in White adults with DM was also elevated compared with non-DM (HR = 1.31; 95%CI: 1.06, 1.61). Five studies were included in another analysis examining fracture prevalence, of which three studies also reported fracture prevalence in White adults. There was a total of 175 previous fractures among 993 Black adults with DM and 384 previous fractures among 1,467 White adults with DM, with a pooled prevalence of 17.5% (95%CI: 15.4, 19.6) and 25.8% (95%CI: 4.8, 46.8), respectively.

Conclusion: Diabetes is associated with an increased risk of fractures in adults of African ancestry, and this risk may be higher than that observed in White populations. Urgent public health measures are needed to curtail the growing problem of diabetes-related fragility fractures, especially in Africa where the prevalence of DM is expected to increase 143% by the year 2045.

P1224
DISORGANISED BONE TISSUE AND MICROFRACTURES AS A POSSIBLE AETIOLOGY OF PERTHES' DISEASE

S. Zhang[1], K. Djopseu[2], C. Chiang[3], F. Milat[1], P. Ebeling[1], R. Zebaze[1]

[1]Dept. of Medicine, School of Clinical Sciences, Monash Univ., Melbourne, Australia, [2]ZEZE co, Yaoundé, Cameroon, [3]Dept. of Medicine, Univ. of Melbourne, Austin Health, Melbourne, Australia

Perthes' disease is characterised by idiopathic osteonecrosis of the hip with a peak incidence between 5 and 8 years of age. Its aetiology remains unknown, although mechanisms that impair blood supply to the femoral epiphysis such as repeated microtrauma may be implicated. In this case report, we discuss the potential role of bone disorganisation (poor arrangement of bone tissue) and microfractures (microcracks) as a novel cause.

Case report: Mr F is a 44-year-old Rwandan man who presented to a medical facility in Cameroon in December 2023 with severe bilateral thigh pain of more than 4 years duration. He had a previous hospital admission for gait abnormalities at the age 8 years, although no diagnosis was made. Following this, Mr. F's gait gradually deteriorated to the extent that 36 years later, he required bilateral elbow crutches for mobility. Hip X-ray revealed chronic bilateral hip osteoarthritis associated with secondary avascular necrosis of both femoral heads, suggesting bilateral Perthes' disease, a diagnosis missed earlier in life. In addition, Mr F exhibited other clinical features suggestive of a congenital disease, including tall stature, right pre-axial polydactyly, left trigger thumb and unusual bilateral palmar creases. Detailed assessment of bone quality using novel image processing software (Alignogram) revealed markedly disorganised bone tissue with disseminated microfractures, multiple foci of microsclerosis, and thick cortices with a narrow medullary cavity. Blood tests were also significant for an isolated elevation of alkaline phosphatase. Altogether, these features likely indicate a disorder of bone formation, such as an unknown form of sclerotic bone dysplasia.

Conclusion: We infer that an unknown congenital disorder has led to disorganised bone formation in this case of likely Perthes' disease. The resulting abnormal load transfer produced damage in the form of microfractures which may have disrupted blood supply at the proximal femur causing bilateral osteonecrosis at a young age. This case is unique as it proposes a novel mechanism of osteonecrosis, Perthes' disease and chronic bone pain, occurring in a patient with a likely, as yet undiagnosed, genetic disorder.

P1225
IN OTHERWISE HEALTHY YOUNG MEN, TRABECULAR BONE SCORE (TBS) IS SIGNIFICANTLY LOWER IN CASE OF INSULIN RESISTANCE: AN ANALYSIS OF THE SIBLOS STUDY

S. van Offel[1], C. Verroken[1], S. Goemaere[1], B. Lapauw[1]

[1]Ghent Univ. Hospital, Ghent, Belgium

Objective: Type 2 diabetes mellitus (T2DM) increases fracture risk, despite a preserved or even increased BMD. The DXA-derived TBS is considered to be a proxy of bone quality and is lower in people with T2DM compared to controls. Whether this is also the case in otherwise healthy, insulin resistant young men has not yet been investigated. We aimed to assess whether insulin resistance already associates with TBS in young healthy men.

Methods: 999 young healthy men were recruited in the region of Ghent and surrounding communities and were cross-sectionally assessed for multiple bone, muscle and metabolic parameters as part of the SIBLOS study. Of 459 participants, aged 35 $\pm$ 5.4 y, data on TBS, fasting glucose and insulin were available. Insulin resistance was defined by a homeostatic model assessment of insulin resistance (HOMA-IR, which is the product of fasting glucose with fasting insulin, divided by a constant) of $\geq$ 2.17. Differences in DXA-derived parameters between the insulin resistant and insulin sensitive group were assessed using t-tests.

Results: Of the 459 participants, 89 (19.4%) were insulin resistant. Mean TBS $\pm$ standard deviation in this group was 1.42 $\pm$ 0.08, which was significantly lower compared to the insulin sensitive group (1.46 $\pm$ 0.08, p = 0.002). Quantitatively, BMD was higher in the insulin resistant group in all measurement regions, but this only reached statistical significance at the femoral neck and total hip BMD (0.87 $\pm$ 0.13 vs. 0.91 $\pm$ 0.14 g/cm^2, p = 0.031; and 1.07 $\pm$ 0.13 vs. 1.11 $\pm$ 0.16 g/cm^2, p = 0.009 respectively).

Conclusion: Despite being years ahead of established T2DM, TBS is lower in insulin resistant as compared to insulin sensitive young men. However, because of the small order of magnitude, no relevant statements about bone quality on the level of the individual patient can be made based upon TBS alone.

P1226
ROLE OF PHYSICAL THERAPY IN ENDOCRINE DISORDERS

S.-D. Birsan[1]

[1]Faculty of Medicine and Pharmacy, Univ. of Oradea, Oradea, Romania

In the complex treatment of endocrine diseases, besides specific endrocrinotherapeutic means, other non-specific therapeutic factors are used. This second category of factors includes physical therapy, It is indicated in some hyper and hypofunctional endocrine disorders. Our interest is kinesiotherapy exerting favorable effects in this category of diseases, by stimulating metabolism and regulating the functions of the central and vegetative nervous system.

During the kinetotherapy sessions, free active exercises will be performed, which interest the muscle groups of the trunk and limbs. As the muscular system is trained and the adipose tissue decreases, active resistance exercises are introduced, executed at a brisk pace, alternated with breathing pauses. It is recommended to frequently change the fundamental positions in which the exercises are performed. The intensity and duration of the effort will be dosed depending on the body's capacity to physical effort and the age of the patient. It is recommended to practice in moderation sports such as: swimming, enema, tourism, rowing, tennis, volleyball, basketball.

Medical gymnastics is indicated in the complex treatment of these conditions, along with hypocaloric diet, anorexigenic hormone therapy and psychotherapy. Systematic practice of gymnastics exercises medically contributes to: stimulating metabolism and improving oxidation processes; general toning of the muscular system; improving peripheral circulation and trophic status of various systems and organs, improving pulmonary ventilation; regulation of functions of the central and vegetative nervous system.

P1227
MYO ENTEZO JOINT PAIN MANAGEMENT

S.-D. Birsan[1]

[1]Faculty of Medicine and Pharmacy, Univ. of Oradea, Oradea, Romania

Muscle injuries over time can worsen leading to a decrease in quality of life by not being able to carry out the usual daily activity. Muscle overloads can be acute or chronic, acute ones occur after a

microtrauma and chronic ones occur as a result of muscle microruptures over time.

Muscle injuries are caused by predisposing factors: endocrine and metabolic, sedentary lifestyle, joint dysfunction; precipitating factors: muscle cramps, myositis, hematomas or muscle injuries as well as non-compliance with training stages, muscle fatigue, temperature drop that predisposes to decreased muscle elasticity, dehydration; perpetuating factors; wrong moves. Symptomatology predominates with a sudden vivid pain with a burning character; presence of bruising; the existence of a painful spot on palpation and the antalgic position accompanied by partial functional impotence. The visual analogue VAS scale is used to assess pain.

Confirmation of myoentheso articular lesions is given by muscle echography confirming muscle injury; its type and severity. Treatment is medication and rehabilitation and in extreme cases surgical. In the first 48 h, the protection of the affected area is applied, segmental housekeeping, cryotherapy, local compression with elastic bandage, keeping the affected limb in a cleavage position. NSAIDs, physiotherapeutic treatment (ultrasound, laser, TENS) and massage is not recommended for a period of 14 d.

The evolution is favorable if the patient immediately goes to the doctor, the therapeutic approach will take into account the degree of bearability of the body to pain and its ability to recover.

P1228
INFLUENCE OF MECHANICAL FACTOR IN TRIGGERING DISC HERNIATION

S.-D. Birsan[1]

[1]Faculty of Medicine and Pharmacy, Univ. of Oradea, Oradea, Romania

The literature mentions the major influence that trauma has in triggering a herniated disc. In lumbar trauma, not only direct trauma is involved. Carrying weights and lifting them, jumping, wrong movements – hyperflexion associated with torsion of the trunk are traumatic factors with repercussions on the lumbar vertebral segment which, besides disc changes, can also influence the dynamics of the spine.

Clinical symptoms can sometimes occur immediately after injury or after a free interval. The trauma can be unique but violent, sometimes large and repeated, but not always the trauma is violent because in some cases the symptoms are installed after mild but repeated traumas that lead to an overwork of the sacral lumbar region and there may be professional microtrauma.

The summation of these microtraumas can cause the installation of a herniated disc which, at a time interval after degenerative changes, will determine places of disposable resistance to minimal effort such as coughing, sneezing will trigger the beginning of the clinical phase of disc herniation. Based on this fact, St.de Seze states that at the origin of sciatica, trauma is a rule, its absence an exception.

The field of rheumatic sciatica has ceded a significant territory to more frequent traumatic sciatica, therefore it must be regarded as an occupational disease in cases where it occurs in an individual whose profession requires efforts of the lumbar spine.

P1229
THERAPEUTIC ULTRASOUND TREATMENT FOR PREVENTION OF BONE DISORDER ASSOCIATED WITH CHRONIC KIDNEY DISEASE IN A MOUSE MODEL

R.-S. Yang[1], C.-Y. Lin[1], S.-H. Liu[1]

[1]National Taiwan Univ., Taipei, Taiwan

Objective: Chronic kidney disease (CKD) is a worldwide public health problem. With the decline of kidney function, increasing the risk of bone disease in CKD patients, caused so-called CKD-associated mineral and bone disorder (MBD). Uremic toxin indoxyl sulfate is considered to be one of the possible risk factors for various CKD types and also affects bone metabolism. Low-intensity pulsed ultrasound (LIPUS) has been used in many animal or clinical trials to treat neurological diseases or bone diseases. Here, we evaluated the protective potential of LIPUS on CKD-MBD using a CKD mouse model.
Methods: C57BL/6j mice (8-week-old) were used to induce CKD using unilateral renal ischemia/reperfusion injury (IRI) with nephrectomy. The left kidneys of the CKD mice were treated using LIPUS (3 MHz, 100 mW/cm^2, and 20 min/d, based on the preliminary experiments). Mice were euthanized 14 d after IRI. The blood BUN, creatinine, cystatin C, albumin, globulin, indoxyl sulfate, calcium ion, phosphate, and FGF23 levels were tested. The bone microstructure was evaluated by μCT.
Results: IRI-CKD mouse model was conducted and it was found that LIPUS stimulation had the protective effects on the increased blood renal function indicators BUN, creatinine and cystatin C and the decreased blood albumin/globulin ratio ($n = 8$, $p < 0.05$); while LIPUS had a partial alleviation effect on the decrease in body weight and kidney weight ($n = 8$, $p = 0.06$). In CKD mice, we also observed that the blood levels of indoxyl sulfate, FGF23, phosphate, and calcium ion increased significantly, which could be effectively reversed by LIPUS stimulation ($n = 8$, $p < 0.05$). Damage to bone microstructure (μCT detection) caused by CKD, including reduced BMD, BV/TV, and trabecular thickness can also be partially, but significantly, alleviated by LIPUS treatment ($n = 8$, $p < 0.05$). LIPUS (100 mW/cm^2) stimulation for 14 days had no effects on the renal function of normal mice and no other abnormalities ($n = 5$, $p > 0.05$).
Conclusion: Elevated blood indoxyl sulfate, FGF23 and phosphate levels in CKD may be related to the occurrence of subsequent bone disorder. LIPUS treatment can effectively alleviate bone disorder associated with CKD.

P1230
FACTORS AFFECTING QUALITY OF LIFE IN PATIENTS WITH OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURE AFTER TREATMENT IN TERTIRY TRAUMA CENTER IN THAILAND

T. Amphansap[1], P. Sujarekul[1], A. Therdyothin[1]

[1]Police General Hospital, Bangkok, Thailand

Objective: To identify factors affecting the quality of life in patients with osteoporotic vertebral compression fracture (OVCF) after 1 y of follow-up.
Methods: A retrospective cohort study of patients with OVCF was performed based on the hospital's electronic database of patients' information from January 1, 2015, to July 31, 2020. Further inquiry

into missing data and quality of life was done via telephone. EQ-5D-3L Questionnaire (Thai version) was employed to assess all aspects of the quality of life.
Results: 421 patients with OVCF were identified from the electronic database search. After exclusion, the remaining 336 participants were recruited (61 males, 275 females). The study revealed that gender, BMD screening, and anti-osteoporotic medication were not associated with the quality of life. However, poor quality of life was associated with age, recurrent fracture after OVCF, and admission of patients with OVCF during the initial visit. An age of over 70 y was associated with poorer quality of life (odds ratio (OR) 11.47, P-value < 0.001). Recurrent fracture after OVCF was also related to poor quality of life (OR 2.47, P-value = 0.003). Admission of patients into the hospital after diagnosis of OVCF was related to a better quality of life than those treated as outpatients.
Conclusion: This study provided information for improving assessment and treatment care in patients with OVCF in Police General Hospital. The admission of patients after OVCF at the first visit was related to improved quality of life, while older age and recurrent fracture negatively impact the outcome. Timely osteoporosis treatment is crucial to prevent future fractures after an OVCF. Fracture liaison service might offer a holistic approach to treating this group of patients with a benefit in better quality of life.

P1231
PARATHYROID CARCINOMA: CAUSE FOR SECONDARY OSTEOPOROSIS AND LOW-ENERGY FRACTURE

T. Bajraktarova Prosheva[1], A. Mucha[1], B. Todorova[1], I. Bitoska[1], S. Mishevska Jovanovska[1], A. Stevchevska[1], M. Srbinoska Bogatinoska[2], V. Limani[1], M. Ilijovska[3], S. Markovikj[1]

[1]Univ. Clinic of Endocrinology, Diabetes and metabolic disorders, Skopje, [2]Public Health Center Makedonski Brod, Makedonski Brod, [3]Newborn Clinic, Skopje, North Macedonia

Parathyroid carcinoma is a rare, malignant neoplasm of the parathyroid gland. Most of the parathyroid carcinomas are hormonally active and they secrete PTH[1]. Parathyroid carcinoma is the cause of primary hyperparathyroidism in 0.1% to 5% of cases. It is a rare condition, with an incidence of 1.25 cases per 10,000,000 people. The average age is 44–54 y, and it is equal to males and females[2]. All patients with hyperparathyroidism will get osteoporosis if the parathyroid tumor is not removed. Vertebral compression fractures are often the result of a fall, but people with osteoporosis can suffer a fracture even when doing everyday things.
Case report: A 52-year-old female patient was present for an examination due to pain in the low back. MRI scan showed compressive fracture of L3-L4 vertebrae. Laboratory findings: PTH 864.1 pg/ml, osteocalcin 250.2 ng/ml, β-CrossLaps 2.61 ng/ml, vitamin D 18.53 ng/ml, total calcium 3.8 mmol/l, calcium ionized. 1.8 mmol/l, creatinine 80 μmol/l, urea 8 mmol/L, the rest of the laboratory analyzes were normal. MIBI scan of parathyroid glands with 99mTc showed increased accumulation of the radiotracer in the lower pole of the right thyroid lobe (projection of the right lower parathyroid gland). DXA scan showed osteoporosis on the lumbar spine and on the neck of the hips. T-score: L1-L4 -3.6; left femur neck -2.9; right femur neck -3.1; Minimally invasive right parathyroidectomy and right lobectomy were performed, and histopathological findings showed changes typical for parathyroid carcinoma.
Conclusion: PTH and calcium levels are much higher in parathyroid carcinoma compared with primary hyperparathyroidism A PTH three times the upper limit of normal is suspicious for malignancy, while a PTH of 10 times higher than normal is positive predictive value of 84% for parathyroid carcinoma[3]. Early surgical approach is the best therapeutic option for that patients. The prognosis depends on the presence of invasion into adjacent structures and metastasis. In 33% of cases, the cancer is well demarcated without extension or distant metastasis, with a very good prognosis. In 33% of cases, the disease will recur and will need reoperation. In 33% of cases, there is a short and aggressive course that leads to death.
References:
1. Byrd C, et al. Parathyroid Cancer. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK519038/
2. Shane E. J Clin Endocrinol Metab 2001;86:485
3. Schaapveld M, et al. Am J Surg 2011;202:590

P1232
PLS3 MUTATIONS IN X-LINKED OSTEOPOROSIS: A CASE REPORT

T. Bazuhair[1], M. Almohaya[2], A. Alturkistani[3], K. Alaybaa[2]

[1]Security Forces Hospital Makkah, Makkah, [2]King Fahad Medical City-Riyadh, Riyadh, [3]King Fahad Medical City, Riyadh, Saudi Arabia

Monogenetic bone disease was linked to multiple mutations, one of them is the gene encoding the 'actin-bundling protein plastin 3(PLS3) located within chromosome band Xq23. Osteoporosis 2ry to PLS3 mutation was 1st recognized in 2013. We describe the clinical characteristics and underlying genetic mutation of a young patient with 1ry osteoporosis.
Case report: A 14-year-old boy was seen in bone clinic for concerns of recurrent fragility fractures. He is the 2nd child of healthy consanguineous parents. He presented with history of multiple fractures due to minimal trauma, his 1st fracture was at age of 18 months and his latest was 4 months prior to his presentation. Apart from mild hearing impairment, he had no significant medical history. He had no history suggestive of 2ry causes and his family history was negative for recurrent fractures or premature osteoporosis. On examination, he was proportionate with a height of 143 cm, a weight of 49 kg. Apart from the blue sclera, no other extra-skeletal features of osteogenesis imperfecta were identified. Spine examination reveals an upright spine with scoliosis. Neurological examination was normal. He had no cushingoid features and his genital exam was prepubertal. Investigations done to exclude secondary causes came back normal. DXA scan showed BMD of lumbar spine (L1-L4) 0.305 g/cm^2, BMD of dual femur neck mean 0.425 g/cm^2 and BMD of dual femur total mean 0.395 g/cm^2. Genetic testing showed mutation in PLS3 gene (Hemizygous). A family screening was done, which revealed a pathogenic variant in the PLS3 gene in his mother (heterozygous). Patient was treated with pamidronate 60 mg IV infusion started in February 2020 and received total of 3 doses then switched to zoledronic acid at a dose of 2.5 mg. A DXA scan was repeated in January 2022 for follow-up, which showed increased bone density with a significant improvement of 124.9% and 57.7% in the BMD of the lumbar spine and in both femurs, respectively. Follow-up BMD done in October 2023, showed significant increase with a 4.2% in BMD of the lumbar spine as well as 11% increase in BMD of the total femur mean.
Conclusion: This case illustrates a rare hereditary cause of early-onset osteoporosis in young male 2ry to PLS-3 mutation, this might guide clinicians to consider screening for PLS3 in such cases.

P1233
A CASE OF SIGNIFICANT HYPERCALCAEMIA SECONDARY TO TERIPARATIDE THERAPY

T. Carroll[1], D. Fitzpatrick[1], N. Fallon[1], N. Maher[1], C. O'Carroll[1], V. V. G. Steen[1], R. Lannon[1], K. Mccarroll[1]

[1]Bone Health Unit, St James Hospital, Dublin, Ireland

Transient asymptomatic hypercalcaemia (up to 16 h after teriparatide administration) is a relatively common side effect that may occur in up to 11% of patients. However, delayed hypercalcaemia (> 24 h) is rare with only few case reports to date. We describe the case of a female who developed a significant and delayed hypercalcaemia after teriparatide in the treatment of her osteoporosis.

Case report: A 72 year old female on teriparatide for treatment of severe osteoporosis was found to have hypercalcaemia (3.3 mmol/l) on routine testing three months after starting therapy. Serum calcium prior to teriparatide initiation was normal at 2.39 mmol/l. On review she reported only mild symptoms of thirst due to polyuria. Her medical history included hypertension and treated hepatitis C, and apart from calcium tablets (1000 mg /d) was on no medications that could contribute to hypercalcaemia. She was admitted to hospital for investigations which identified a serum 25(OH)D of 74 nmol/l, a low PTH of 6.0 pg/ml and normal test results for 1,25(OH)D (115 pmol/l), PTHrP (< 1.4 pmol/l), serum electrophoresis and angiotensin converting enzyme (39 IU/l). CT abdomen, pelvis and thorax revealed no evidence of malignancy and an isotope bone scan ruled out bony lytic lesions or skeletal metastases. Her hypercalcaemia normalised after 4 d, following treatment with IV fluids and cessation of teriparatide and calcium supplements. On restarting teriparatide, delayed hypercalcaemia re-occurred and her treatment was switched to denosumab.

Conclusion: Delayed and nonmild hypercalcaemia (> 3.0 mmol/l) due to teriparatide is rare but may result in therapy withdrawal. The underlying predisposing risk factors remain unclear and support the routine assessment of a serum calcium level on treatment. Stopping or reducing calcium supplements and/or the frequency of teriparatide injections may be considered. Given the extent of hypercalcaemia and its reoccurrence in our patient, teriparatide was stopped and her therapy was switched to denosumab.

P1234
A CASE OF OSTEONECROSIS OF THE EXTERNAL AUDITORY CANAL ASSOCIATED WITH BISPHOSPHONATE THERAPY

T. Carroll[1], D. Fitzpatrick[1], N. Fallon[1], G. Steen[1], N. Maher[1], R. Lannon[1], K. Mc Carroll[1]

[1]Bone Health Unit, St James Hospital, Dublin, Ireland

Osteonecrosis of the auditory canal associated with bisphosphonate use is very rare. It was first reported in 2006 with only 19 cases described in the literature. In most patients, it occurs during the treatment of osteoporosis with oral bisphosphonates. Some cases have been bilateral and occurred spontaneously but the pathogenesis is unclear with similar risk factors for MRONJ proposed. We report the case of a patient on oral bisphosphonates who developed this rare condition.

Case report: A 60-year-old lady attending an otolaryngology clinic for routine follow up was noted to have an area of de-epithelialisation in her left auditory canal with underlying bone necrosis and exposure of her temporomandibular joint capsule. Six months previously she had aural microsuctioning to treat otitis externa but had been asymptomatic since with no otalgia, otorrhea or hearing loss. Her medical history included osteoporosis, treated with risedronate for the previous four years. She also a history of breast cancer (treated with local surgical excision and adjuvant chemotherapy), hypertension and ischaemic heart disease. Temporal bone CT confirmed osteonecrosis with an area of demineralisation in the left external auditory canal but with no middle ear abnormalities. A biopsy showed necrotic tissue potentially consistent with a cholesteatoma, however given the location in the external auditory canal this was excluded as a cause. As she was deemed to have a low fracture risk, her risedronate was stopped and she was managed conservatively. There was gradual healing of the area with complete re-epithelisation noted at an outpatient review three years later. She has remained off bisphosphonates and BMD has been stable.

Conclusion: Osteonecrosis of the external auditory canal is a very rare potential adverse effect of bisphosphonate therapy. Given their widespread use, it's important to be aware of this possible diagnosis in patients on bisphosphonates who have ear infections, pain or discharge and who may warrant more careful aural examination. In our patient, predisposing factors may have been possible trauma from aural microsuctioning and prior chemotherapy. The decision to stop bisphosphonates in these cases needs to be carefully balanced against the risk of future fracture.

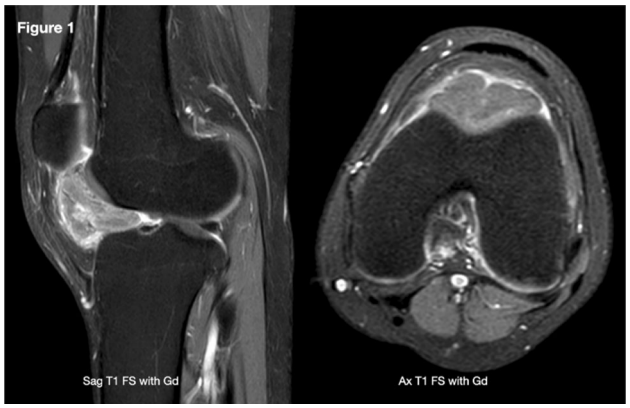
P1235
SYNOVIAL HEMANGIOMA PRESENTED WITH CHRONIC PAINFUL INFRAPATELLAR MASS: A CASE REPORT

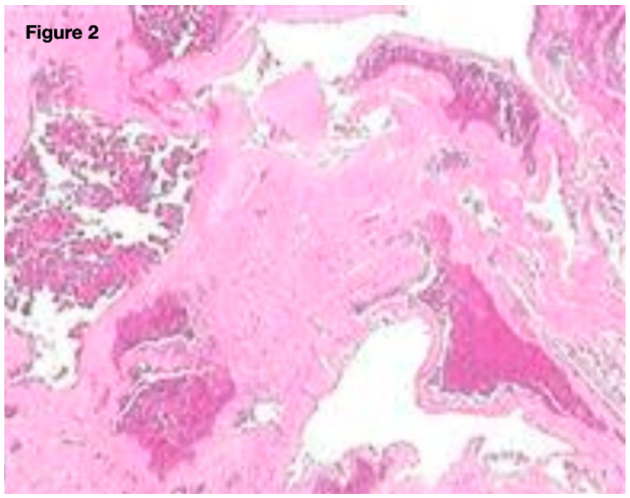
T. Chobpenthai[1], W. Suphakitchanusan[2], N. Wongboonkuakul[1], K. Trakulsujaritchok[1], C. Decha-Umphai[1]

[1]Princess Srisavangavadhana College of Medicine, Chulabhorn Royal Academy, [2]Chulabhorn Hospital, Chulabhorn Royal Academy, Bangkok, Thailand.

Synovial hemangiomas are rare benign vascular anomalies enveloped by synovial lining, first documented by Bouchut in 1856 [1]. These neoplasms can arise within the intra-articular region often causing effusions and knee pain. Their cause remains unknown [2]. Prompt diagnosis and intervention are crucial to prevent chondral damage. Diagnosis, often delayed due to the lack of distinct clinical signs, relies on histopathological examination [3]. This report details a unique case featuring a painful infrapatellar mass confirmed as a synovial hemangioma. Notably, the absence of typical MRI findings emphasizes the significance of arthroscopic excision for diagnosis and symptom relief.

Case report: A 20-year-old female presented with persistent anterior left knee pain, exacerbated during activities involving stairs. Despite prior pain management and physical therapy, she had a painful lump beneath her patella that worsened over time. A previous arthrocentesis provided no relief. Physical examination revealed a palpable, immobile, 5 cm mass along the parapatellar tendon, limited knee flexion and extension, and normal ligament stability. MRI of left knee T1 FS with Gd showed a lobulated intra-articular mass in Hoffa's fat pad, resembling soft tissue chondroma (Fig. 1). Arthroscopic excision was performed, confirming histopathologic diagnosis as sections of synovium show numerous dilated blood vessels and venous proliferation (Fig. 2). Recovery was successful, with no residual tumor observed on follow-up MRI after one year.





Discussion: The case involves a unique presentation of synovial hemangioma, typically found in the suprapatellar pouch but within the infrapatellar region. The patient had a palpable mass, expediting diagnosis and improving clinical outcomes. Arthroscopic excision was chosen due to its minimally invasive nature and the well encapsulated mass's potential for complete removal.

Conclusion: Synovial hemangiomas are rare benign vascular anomalies that can occur in various anatomical structures enveloped by synovial lining, including intra-articular regions. Delayed diagnosis can lead to complications such as chondral impairment and secondary degeneration.

References:

1. Devaney K, et al. Human Pathol 1993;24:737.
2. Auran RL, et al. J Knee Surg 2022;35:597.
3. Dunet B, et al. Orthop Traumatol Surg Res 2014;100:337.

P1236
EFFICACY OF INTRA-ARTICULAR PLATELET-RICH PLASMA COMPARED WITH PLACEBO IN KNEE OSTEOARTHRITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

T. D. Thais[1], M. A. Maxime[1], S. B. Sabine[1], R. C. Roland[1]

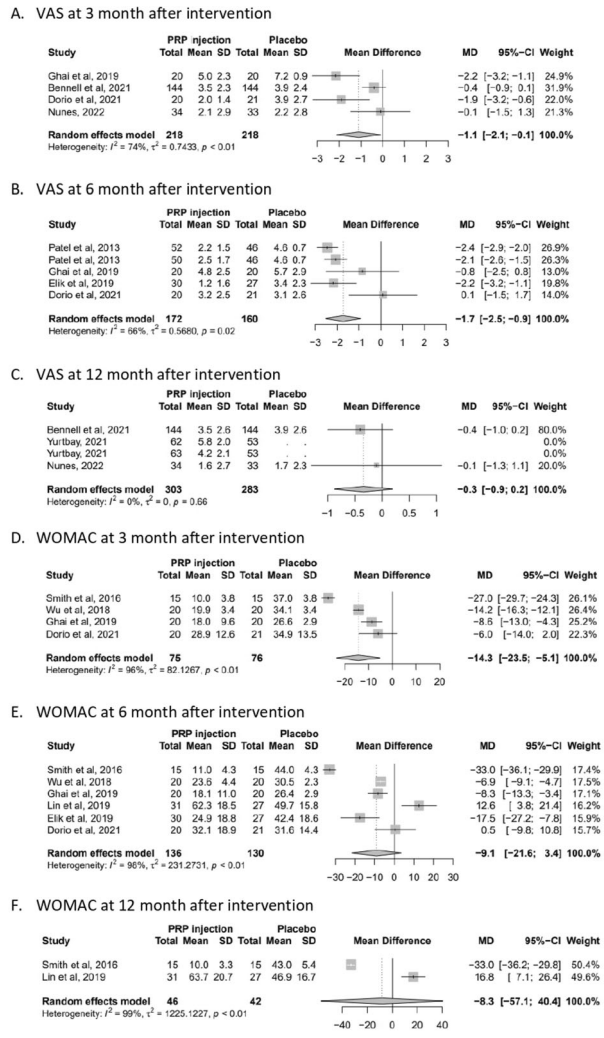
[1]Hospices Civils de Lyon, Lyon, France

Objective: Our primary aim was to evaluate the efficacy of intra articular platelet-rich plasma (PRP) injection on pain and function in knee osteoarthritis compared with intra-articular saline solution injection (placebo).

Methods: A search for randomized controlled studies (RCTs) performed on intra articular platelet-rich plasma injection compared with intra articular saline solution injection up to November 2022 (PROSPERO registration number: CRD42022311893) was undertaken in publication databases. Studies that reported pain and function evaluation with VAS or WOMAC, size sample, study date and location were included. A meta-analysis was conducted to identify the efficacy on pain and function of intra articular platelet-rich plasma injection.

Results: We identified 10 RCTs including 1006 patients (541 on PRP, 465 on placebo) in 7 countries, 68% were women. The mean age was 58.7 y. VAS analysis at 3 and 6 months after intervention was in favor of PRP use (respective MD -1.1 [-2.1; -0.1] and -1.7 [-2.5; -0.9]) with high heterogeneity, whereas no efficacy was shown at 12 months. WOMAC analysis at 3 months after intervention was in favor of PRP use (MD -14.3 [-23.5; -5.1]), but no efficacy was shown at 6 and 12 months.

Figure 1. VAS and WOMAC score at 3, 6 and 12 month after intervention



Conclusion: We have found a weak efficacy of PRP in knee osteoarthritis, up to 6 months after intervention, so the clinical relevance of PRP use is debatable. Further investigation should be

conducted to assess the efficacy of intra articular PRP depending on age, type and endotype of KOA.

P1237
COMPARISON OF TREATMENT OUTCOMES BETWEEN ATYPICAL FEMORAL FRACTURES WITH AND WITHOUT BONE-MODIFYING DRUGS FOR CANCER BONE METASTASIS: A RETROSPECTIVE STUDY

T. Fukui[1], K. Oe[1], Y. Kumabe[1], T. Niikura[2], R. Kuroda[1]

[1]Dept. of Orthopaedic Surgery, Kobe Univ. Graduate School of Medicine, [2]Dept. of Orthopaedic Surgery, Hyogo Prefectural Nishinomiya Hospital, Kobe, Japan

Objective: It has been suggested that the administration of bone resorption inhibitors for osteoporosis is associated with the occurrence of atypical femoral fractures (AFFs). On the other hand, higher doses of bone resorption inhibitors are usually administered to patients with cancer bone metastases (CBM) as bone-modifying drugs (BMDs) to treat bone-related events, and the relationship between BMD and AFF is attracting attention. The objective of this study was to compare the treatment courses between AFF patients with and without administration of BMD.
Methods: The subjects were AFF patients with BMD administration history, collected from past multicenter study (CBM-AFF group), and AFF patients without BMD administration who were treated at one university hospital (AFF group). The period from AFF surgery to radiographical bone union, the rate of prodromal symptoms, the rate of bilateral AFF cases, and the rate of cases in which bone resorption inhibitors were discontinued were compared between the two groups.
Results: The subjects were 30 limbs of 19 patients in the CBM-AFF group and 22 limbs of 21 patients in the AFF group, and no significant differences were observed in the gender ratio or age. In cases where osteosynthesis was performed for a complete fracture and bone union was confirmed, the average bone union time was 15.1 months (11 limbs) in the CBM-AFF group and 7.9 months (11 limbs) in the AFF group, which was significantly longer in the CBM-AFF group. While there was no significant difference in the rate of prodromal symptoms between the two groups, bilateral AFF cases were significantly more in the CBM-AFF group (13 out of 19 cases) than in the AFF group (1 out of 21 cases). The number of patients in whom bone resorption inhibitors were discontinued due to AFF was 15 in the AFF group and 0 in the CBM-AFF group.
Conclusion: Bone union could be delayed in AFF patients with BMD administration for CBM compared to those without it.

P1238
INSIGHTS INTO HIP HEALTH: PREVALENCE AND CO-EXISTENCE OF BONE, JOINT, AND MUSCLE DISORDERS—THE ROAD STUDY

T. Iidaka[1], G. Tanegashima[1], S. Muraki[2], H. Oka[3], K. Nakamura[4], T. Akune[5], S. Tanaka[6], N. Yoshimura[1]

[1]Dept. of Preventive Medicine for Locomotive Organ Disorders, 22nd Century Medical and Research Center, The Univ. of Tokyo, Tokyo, [2]Dept. of Preventive Medicine for Locomotive Organ Disorders, 22nd Century Medical & Research Center, Faculty of Medicine, Univ. of Tokyo, Tokyo, [3]Division of Musculoskeletal AI System Development, Faculty of Medicine, The Univ. of Tokyo, Tokyo, [4]Towa Hospital, Tokyo, [5]National Rehabilitation Center for Persons with Disabilities, Saitama, [6]Dept. of Orthopaedic Surgery, Faculty of Medicine, The Univ. of Tokyo, Tokyo, Japan

Objective: We investigated the prevalence and coexistence proportions of bone disease (osteoporosis, OP), joint disease (osteoarthritis, OA), and muscle weakness in the hip regions of Japanese men and women, based on data obtained from a large-scale nationwide cohort study entitled ROAD (Research on Osteoarthritis/Osteoporosis Against Disability).
Methods: We analyzed data from 1558 participants (505 men and 1053 women; mean age, 65.5 y) residing in mountainous and coastal communities, using information from the 3rd survey of the ROAD study. Radiographs were scored using the Kellgren/Lawrence (KL) grading system, and radiographic hip OA was defined as a KL score ≥ 2. OP at the femoral neck was defined based on WHO criteria. To calculate the cutoff values for quadriceps strength, we conducted ROC analysis with quadriceps strength as the independent variable and the presence or absence of sarcopenia as the dependent variable, stratified by sex.
Results: The prevalence of OP at the femoral neck was 4.1% and 16.0% in men and women, respectively. The prevalence of radiographic hip OA was 16.1% and 12.4% in men and women, respectively, and the prevalence of muscle weakness was 37.0% and 31.6% in men and women, respectively, in the 3rd survey. 62.1% of OP at the femoral neck and 56.3% of radiographic hip OA were accompanied by muscle weakness. The presence of muscle weakness was associated with OP at the femoral neck (odds ratio 2.14, 95%CI 1.47–3.12) and radiographic hip OA (odds ratio 1.74, 95%CI 1.22–2.47).
Conclusion: This population-based study provided epidemiological indices of OP at the femoral neck, radiographic hip OA, and muscle weakness in the hip joint. Muscle weakness was significantly associated with both OP at the femoral neck and radiographic hip OA.

P1239
PREOPERATIVE INCIDENCE AND RISK FACTORS OF DEEP VEIN THROMBOSIS IN JAPANESE PATIENTS UNDERGOING TOTAL HIP ARTHROPLASTY

T. Kaneko[1], K. Hayakawa[1], F. Tokimura[1], T. Miyazaki[1]

[1]Tokyo Metropolitan Institute for Geriatrics and Gerontology, Tokyo, Japan

Objective: Preoperative deep vein thrombosis (DVT) is a risk factor for postoperative venous thromboembolism (VTE), causing severe mortality. Early detection of preoperative DVT is essential to prevent postoperative VTE. However, little is known regarding preoperative DVT in patients undergoing major surgery. The present study aimed to determine the incidence and risk factors of preoperative DVT in patients admitted for total hip arthroplasty (THA).
Methods: From August 2017 to September 2022, 243 patients admitted for THA at Tokyo Metropolitan Geriatric Hospital were enrolled in this study. Patients medical records and preoperative laboratory data were retrospectively collected. According to the results of lower-limb ultrasonography, patients were divided into the non-DVT (n = 136) or the DVT group (n = 43). The incidence of DVT and independent risk factors for preoperative DVT were investigated using univariate and multivariate logistic regression analyses.
Results: The mean age was 74.0 ± 8.4 y. Preoperative DVT was diagnosed in 43 of the 243 (17.7%) patients. The risk of DVT was significantly high ($p < 0.05$) in patients with advanced age, increased D-dimer levels, and malnutrition status, as assessed by the Geriatric Nutritional Risk Index (GNRI). Multivariate analysis showed that advanced age, increased D-dimer level, and malnutrition status assessed by GNRI were independent risk factors for preoperative DVT.

Conclusion: A high incidence of preoperative DVT was observed in patients undergoing THA. Advanced age, increased D-dimer levels, and malnutrition assessed by the GNRI increased the risk of preoperative DVT. Screening high-risk subgroups for preoperative DVT is necessary to prevent postoperative VTE.

P1240
BONE STATE IN PATIENTS WITH ANKYLOSING SPONDYLITIS: ASSESSMENT OF POTENTIAL RISK FACTORS

T. Karasevska[1], O. Ivashkivskyi[2], I. Kutyrkina[3], H. Novytska[4], R. Potomka[4], M. Dzhus[1]

[1]Bogomolets National Medical Univ., [2]Communal Non-Commercial Institution "Oleksandrivska Clinical Hospital", [3]Medical center "Gerz", [4]Communal Non-Commercial Institution "Oleksandrivska Clinical Hospital", Kyiv, Ukraine

Objective: To determine the factors that may influence bone loss in Ukrainian patients with ankylosing spondylitis (AS).
Methods: This study included 69 patients with determined AS. We evaluated the influence of sex, age, level of vitamin D, BASFI, and BASDAI on BMD by DXA measurement.
Results: The study involved 16 female and 53 male patients. The average age of the patients was 42,9 ± 13,2 y; the average disease duration was 13,4 ± 9,8 y. Our study recognized osteoporosis in the lumbar spine in 30,4% and the femoral neck in 11,6%. There were no sex differences: in lumbar spine BMD (0,956 ± 0,24 vs. 0,971 ± 0,19 g/cm^2) or femoral neck BMD (0,796 ± 0,14 vs. 0,789 ± 0,12 g/cm^2) males vs. females respectively. The patients with a disease duration less than 10 years (6,7 ± 1,54) compared with the patients with a disease duration > 10 y (21,7 ± 11,2) had lower BASFI (23,9 ± 8,6 vs. 60,8 ± 26,9; t = -2,61; p = 0,02). However, there were no differences between groups in lumbar spine BMD (0,986 ± 0 vs. 1,104 ± 0,28 g/cm^2) or femoral neck BMD (0,858 ± 0,16 vs. 0,786 ± 0,11 g/cm^2). BASFI positively correlated with the age (rS = 0,88; p < 0,05) but was not statistically significant with the lumbar spine BMD or femoral neck BMD and vitamin D level. Otherwise, BASDAI negatively correlated with the lumbar spine BMD (rS = -0,77, p < 0,05) but was not significant with age, femoral neck BMD or vitamin D level.
Conclusion: Osteoporosis is common in patients with AS. The highest prevalence was on the lumbar spine compared with the femoral neck. The lumbar spine BMD negatively correlated with BASDAI but was insignificant in disease duration, BASFI, or vitamin D level in. Further research is needed to identify patients with AS at risk for the development of osteoporosis and its complications.

P1241
IS IT NECESSARY TO REPEAT BMD FOR PATIENTS RECEIVING DENOSUMAB? BASELINE RESULTS FROM A QUALITY IMPROVEMENT INITIATIVE

T. Khan[1], M. Alagha[2], C. Hoy[3], R. Clara[4], J. Thain[5], K. Clemens[1]

[1]Division of Endocrinology and Metabolism, Dept. of Medicine, Western Univ., [2]Dept. of Medicine, Western Univ., [3]Division of Endocrinology and Metabolism, Dept. of Medicine, Western Univ., [4]Quality Measurement and Clinical Decision Support, St. Joseph's Healthcare, [5]Division of Geriatrics, Dept. of Medicine, Western Univ., London, ON, Canada

Objective: The utility of repeating BMD in patients taking anti-osteoporosis therapy has been questioned, as a vanishingly small number of patients taking or denosumab demonstrate convincing evidence of bone loss. In this quality improvement project, we are aiming to reduce the proportion of patients who receive BMD testing to every 2 y or less, while receiving chronic denosumab therapy. At baseline, we assessed the proportion of patients who had convincing evidence of bone loss defined as loss of BMD at the same site on repeat measurements, or loss of BMD at multiple sites on one measurement, and those who required a change in therapy.
Methods: We assessed postmenopausal women who were adherent with denosumab and had at least two repeat BMD measurements following a baseline study.
Results: 54 consecutive patients with a mean age of 70.1 ± 8.3 y met inclusion criteria. They had received denosumab for a mean of 6.1 ± 2.7 y. Baseline BMD T-scores were -2.4 ± 1.2 at the lumbar spine (LS) and -2.3 ± 0.6 at the femoral neck (FN). The average interval between baseline and first followup BMD, and between the first and second followup BMD was 19.2 ± 8.5 months and 21.4 ± 12.5 months, respectively. Only 2 of 54 patients (3.7%) experienced significant loss of LS BMD, which stabilized for one, and improved for the other patient on repeat measure. Two of 54 patients experienced a decrease in FN BMD from baseline to the first repeat BMD (3.7%), which stabilized for both patients on repeat measurements. No patient experienced consistent loss of BMD at both sites between the baseline and final measurements. A patient who lost BMD also fractured and was switched to romosozumab from denosumab. Antiresorptive therapy was not changed in anyone else.
Conclusion: Our initiative suggests that among postmenopausal women treated with denosumab at the Osteoporosis and Bone Disease Program in London, Ontario, there was no convincing loss of BMD for > 97% of patients over time, and only one patient required a change in therapy (mostly due to a fracture while on treatment). We will investigate the utility and safety of reducing BMD testing in patients taking denosumab at our centre.

P1242
RELATIVE GROWTH RATES FOR HEIGHT AMONG CHILDREN AND ADOLESCENTS LIVING WITH HIV ON ANTIRETROVIRAL THERAPY IN ZIMBABWE AND ZAMBIA

T. M. Madanhire[1], A. M. Macdougall[2], L. K. Kasonka[3], H. M. Mabuda[3], M. C. Chisenga[3], T. B. Bandason[1], N. D. Dzavakwa[1], S. V. Simms[1], K. W. Ward[4], R. A. F. Ferrand[1], N. M. Mohammed[2], C. L. G. Gregson[5]

[1]The Health Research Unit, Harare, Zimbabwe, [2]London School of Hygiene and Tropical Medicine, London, UK, [3]Univ. Teaching Hospital, Lusaka, Zambia, [4]Univ. of Southampton, Southampton, UK, [5]Univ. of Bristol, Bristol, UK

Objective: Children with HIV (CWH) are now surviving to adulthood though they still exhibit impaired growth characterised by stunting and wasting. We aimed to identify the height growth patterns among CWH and determine age at peak-height-velocity (aPHV).
Methods: In this secondary analysis data were collected prospectively in the VITALITY randomised controlled trial conducted in Zimbabwe and Zambia (PACTR20200989766029). The trial recruited 842 CWH (11–19 y) established on ART for ≥ 6 months to determine whether vitamin-D_3/calcium supplementation improves bone health with follow-up to 96 weeks. Anthropometry was measured at 12-week intervals; weight- and height-for-age were calculated using UK-reference values, with z-score ≤ -2 classifying those underweight and stunted. Analysis of height trajectories was performed using the SuperImposition by translation and rotation (SITAR) adjusting for size, pubertal-timing and growth-rate.
Results: We recruited 448(53.2%) females and 394(46.8%) males; baseline median(IQR) age was 15.5 (IQR:13.2–17.9) y. CWH were

taking ART for median(IQR) 9.8(6.3–12.3) y of their lives and 81.9% (n = 688) were on an ART regimen containing tenofovir disoproxil fumarate. At baseline, 29.9% (n = 252) and 30% (n = 253) were stunted and wasted; mean(SD) height-for-age z-score was -1.68 (1.05) and -1.21 (1.05) for males and females respectively. Over 96 weeks (n = 786), median (IQR) height gains were 6.9 (1.7–10.6) cm and 2.1 (0.6–6.1) cm whilst aPHV was 15.0 y (PHV:8.2 cm/y) and 13.2 y (5.6 cm/y) for males and females respectively. Size was more strongly correlated with tempo in males than females (0.4 vs. 0.2), whilst size was more negatively correlated with velocity in females than males (-0.5 vs. -0.02).

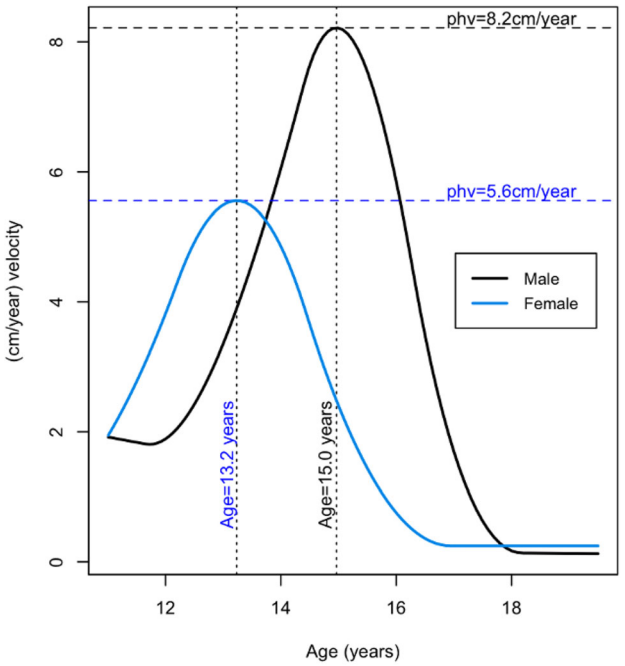


Figure 1. SITAR adjusted height velocity curves by sex

Conclusion: There is a high prevalence of stunting among CWH in Zimbabwe. Both males and females showed delayed PHV compared to UK estimates (females:11.7, males:13.6 y) with later puberty predicting greater overall height. However, slower growth rates predicted greater overall height attainment particularly in females. Findings raises concerns for persistent height deficits in adulthood known to impact human capital.

P1243
RELATIVE ASSOCIATIONS BETWEEN VITAMIN D METABOLITES AND BONE TURNOVER AMONG AFRICAN ADOLESCENTS WITH PERINATALLY ACQUIRED HIV

T. M. Madanhire[1], K. W. Ward[2], A. M. Macdougall[3], N. M. Mohammed[3], L. K. Kasonka[4], H. M. Mabuda[4], M. C. Chisenga[4], J. Tang[5], W. D. F. Fraser[5], T. B. Bandason[1], N. D. Dzavakwa[1], S. V. Simms[1], R. A. F. Ferrand[1], C. L. G. Gregson[6]

[1]The Health Research Unit, Harare, Zimbabwe, [2]Univ. of Southampton, Southampton, UK, [3]London School of Hygiene and Tropical Medicine, London, UK, [4]Univ. Teaching Hospital, Lusaka, Zambia, [5]Univ. of East Anglia, Norwich, UK, [6]Univ. of Bristol, Bristol, UK

Objective: Vitamin D metabolism can be dysregulated in people living with HIV. We aimed to determine the potential mechanism by which vitamin D metabolism regulates bone turnover in adolescents with perinatally acquired HIV in southern Africa.

Methods: A cross sectional study enrolled adolescents (11–19 y) with HIV taking antiretroviral therapy (ART) for ≥ 6 months. Sociodemographic, clinical and dietary data were recorded. Vitamin D_3 metabolites [25(OH)D, $1,25(OH)_2D$, $24,25(OH)_2D$], intact PTH and bone turnover markers (BTMs) [CTX and P1NP] were measured after fasting. Liquid chromatography tandem mass spectrometry measured vitamin D_3 metabolites, whilst intact PTH and BTMs were analysed by electrochemiluminescence immunoassay. Stratified by 25(OH)D [< 75 vs. ≥ 75 nmol/L], we assessed direct, indirect, and total effects between observed standardized vitamin D_3 metabolites, intact PTH and BTMs using structural equations modelling (SEM) adjusted for age, sex and country.

Results: The SEM showed PTH was positively associated [β = 0.21, 95%CI 0.10, 0.32] with $1,25(OH)_2D$ when 25(OH)D < 75 nmol/L with evidence of an interaction [β = -0.11, 95%CI: -0.20, -0.02] between PTH and 25(OH)D on $1,25(OH)_2D$. A positive relationship between 25(OH)D and $24,25(OH)_2D$ was seen irrespective of 25(OH)D level. $24,25(OH)_2D$ was inversely related to BTMs, particularly in those with 25(OH)D < 75 nmol/L; CTX: [β = -0.15, 95%CI: -0.24, -0.06] and P1NP: [β = -0.14, 95%CI: -0.22, -0.06]. A further interaction was identified between dietary calcium and 25(OH)D on PTH [-0.15 SD [95%CI: -0.22, -0.07].

Characteristic	Description	Result
N	842	
Sex	Female	53.2%
Age, y	Median (IQR)	15.5 (13.2-17.9)
Duration on ART, y	Median (IQR)	9.8 (6.3-12.3)
HIV viral load	>60 copies/ml	19.6%
25(OH)D, nmol/L	Mean (SD)	66.1 (16.5)
$1,25(OH)_2D$, pmol/L	Mean (SD)	210.6 (70.4)
$24,25(OH)_2D$, nmol/L	Mean (SD)	4.1 (1.6)
Intact PTH, pmol/L	Median (IQR)	4.3 (3.3-5.6)
CTX, µg/L	Median (IQR)	1.5 (0.9-2.1)
P1NP, µg/L	Median (IQR)	467.5 (210.3-850.6)

Conclusion: Associations between 25(OH)D, PTH, $1,25(OH)_2D$ and BTMs in adolescents living with HIV appear dependent on 25(OH)D concentrations and calcium intake. A novel pathway between 25(OH)D, $24,25(OH)_2D$ and BTMs was seen. Findings enhance understanding of vitamin D metabolism in people living with HIV.

P1244
ASSOCIATION BETWEEN 25-HYDROXYVITAMIN D AND PTH IN CHILDREN AND ADOLESCENTS LIVING WITH HIV IN ZAMBIA AND ZIMBABWE: A CROSS-SECTIONAL STUDY

T. M. Madanhire[1], K. W. Ward[2], A. M. Macdougall[3], N. M. Mohammed[3], L. K. Kasonka[4], H. M. Mabuda[4], M. C. Chisenga[4], J. Tang[5], W. D. F. Fraser[5], T. B. Bandason[1], N. D. Dzavakwa[1], S. V. Simms[1], R. A. F. Ferrand[1], C. L. G. Gregson[6]

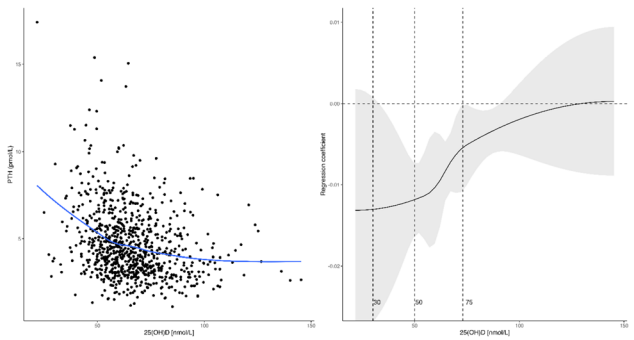
[1]The Health Research Unit, Harare, Zimbabwe, [2]Univ. of Southampton, Southampton, UK, [3]London School of Hygiene and Tropical Medicine, London, UK, [4]Univ. Teaching Hospital, Lusaka, Zambia, [5]Univ. of East Anglia, Norwich, UK, [6]Univ. of Bristol, Bristol, UK

Objective: Low vitamin D is commonly reported in the context of HIV infection, but no study has examined what constitutes 'adequate' vitamin D in those living with HIV. This study aimed to determine the association between total 25(OH)D and PTH in an adolescent population living with HIV in Zambia and Zimbabwe.

Methods: A cross-sectional study recruited adolescents (11–19 y) perinatally infected with HIV and established on antiretroviral

therapy (ART) for at least 6 months. Sociodemographic and clinical characteristics were recorded and anthropometry measured. Weight- and height-for-age were calculated using UK-reference values, with z-score $\leq$ -2 classifying those underweight and stunted. Fasted blood samples were used to measure vitamin D metabolites, intact PTH and bone turnover markers. Liquid chromatography tandem mass spectrometry methods were used for 25(OH)D and 1,25$(OH)_2$D whilst PTH was analysed by electrochemiluminescence immunoassay. The association between total 25(OH)D and PTH was determined by natural cubic spline regression modelling.

Results: The study enrolled 842 participants (female: 53.2%) with median age 15.5 (IQR 13.2–17.9) y. The median duration of ART was 9.8 [IQR 6.3–12.3] y, despite which 19.6% had an unsuppressed HIV viral load (> 60 copies/ml). Most (n = 688; 81.7%) were taking tenofovir disoproxil fumarate (TDF), 6.4% were taking efavirenz. Stunting and underweight were observed in 29.9% and 30.0% respectively. The mean (SD) concentrations of total 25(OH)D and 1,25$(OH)_2$D levels were 66.1(16.5) nmol/L and 210.6(70.4) pmol/L respectively, and median PTH level was 4.3 (IQR 3.3–5.5) pmol/L. There was an inverse nonlinear relationship between total 25(OH)D and PTH which generated an inflection point at 74.6 nmol/L (95%CI 74.5–75.2). Results were consistent by TDF and viral suppression.



Conclusion: The study identified an inverse relationship between 25(OH)D and PTH concentrations with a much weakened association when 25(OH)D exceeded 75 nmol/L. In the context of a population with very low dietary calcium intake, transitioning through puberty, and seasonal variation in 25(OH)D status, the impact of this observation on bone and other outcomes needs to be determined.

P1245
OSTEOCHONDRAL AUTOLOGOUS TRANSPLANTATION VERSUS ARTHROSCOPIC DEBRIDEMENT WITH DRILLING IN THE TREATMENT OF TALAR OSTEOCHONDRAL LESIONS AND DEFECTS

O. A. Burianov[1], A. P. Liabakh[2], T. M. Omelchenko[1], E. A. Levitskiy[1], O. A. Turchin[2], L. V. Khimion[3]

[1]Bogomolets National Medical Univ., Traumatology and Orthopaedic Dept., [2]State Institution "Institute of Traumatology and Orthopaedics of National Academy of Medical Sciences of Ukraine", Foot Pathology Dept., [3]Shupyk National Healthcare Univ. of Ukraine, Internal Diseases, Family Medicine, Hematology and Transfusiology Dept., Kyiv, Ukraine

Objective: To conduct a comparative analysis of the results of arthroscopic debridement with drilling (ADD) vs. osteochondral autologous transplantation (OAT) in the treatment of talar osteochondral lesions and defects (OHLD) based on the assessment of the function of the ankle joint, the level of pain and changes in the range of movements (ROM) in the affected joint.

Methods: The study included 40 patients with OHLD, with an average area of 3.14 cm^2 and a depth of 1.15 cm, located in the posterior and middle medial part of the talus block. In the group#1 performed ADD. In group#2—OAT. The results were evaluated before surgery, at 12 and 24 months. The level of pain to VAS, the function to AOFAS, the ROM in the joint were studied.

Results: After treatment, there was a significant reduction in pain with the best result in group#2 ($p < 0.05$). AOFAS showed that after 12 and 24 months the functional state of the joint in group#2 was better than in group#1 ($p < 0.01$). After 12 months, ROM increased significantly in both groups. After 24 months, there was no increase in ROM in group#1, and in group#2 the increase ROM was statistically significant ($p < 0.01$), which confirmed the higher prospects and stability of the result when performing OAT (Table 1).

Table 1. Comparison of the results of arthroscopic debridement with drilling (Group#1) vs. osteochondral autologous transplantation (Group#2)

Index (M±σ)	Before surgery		12 months after surgery		24 months after surgery	
	Group#1	Group#2	Group#1	Group#2	Group#1	Group#2
Pain (VAS, cm)	5,7±0,3	5,7±0,8	1,1±0,1	1,1±0,2	0,9±0,1	0,5±0,2
	p>0.1		p>0.1		p<0.05	
Function (AOFAS, points)	57,8±1,4	59,4±1,2	86,7±1,7	91,2±1,8	90,3±1,2	94,9±1,1
	p>0.1		p<0.01		p<0.01	
Foot extension, degrees	13,9±1,3	14,0±0,9	18,1±0,7	17,9±0,6	18,0±0,4	19,5±0,5
	p>0.1		p>0.1		p<0.01	
	Group#1		Group#2		before surgery/12	
Acceleration gain, degrees	4,2±0,6		3,9±0,4		months after surgery	
	p>0.1					
	Group#1		Group#2		12 months/24 months after surgery	
	0,1±0,04		1,6±0,1			
	p<0.01					
Foot flexion, degrees	23,0±1,1	22,9±1,2	27,8±0,9	27,6±1,0	28,0±0,8	30,7±0,9
	p>0.1		p<0.05		p<0.01	
Acceleration gain, degrees	Group 1		Group 2		before surgery/12 months after surgery	
	5,2±0,7		4,4±0,5			
	p>0.1					
	Group 1		Group 2		12 months/24 months after surgery	
	0,2±0,05		3,1±0,09			
	p<0.001					

Conclusion: OAT is better than ADD for talar OHLD, provides maximum recovery of the joint surface, significantly reduces pain and improves ankle function.

P1246
MORNING STIFFNESS AND DISEASE ACTIVITY LEVEL IN PATIENTS WITH RHEUMATOID ARTHRITIS UNDERGOING BIOLOGICAL THERAPY

J. Obradovic-Gajic[1], J. Zvekic-Svorcan[2], K. Boskovic[2], T. Nikolic[1], T. Jankovic[2], N. Igic[3]

[1]Special Hospital for Rheumatic Diseases, [2]Univ. of Novi Sad, Faculty of Medicine Novi Sad. Special Hospital for Rheumatic Diseases, [3]Univ. of Novi Sad, Faculty of Medicine Novi Sad, Novi Sad, Serbia

Objective: To examine the association between morning stiffness (MS) and the degree of disease activity in patients diagnosed with rheumatoid arthritis (RA) receiving biological therapy.

Methods: This prospective cross-sectional study involved 56 RA patients of both sexes treated with disease-modifying antirheumatic drugs (bMARDS) at the Special Hospital for Rheumatic Diseases, Novi Sad, Serbia. The study was approved by the institutional Ethics Committee (14/32–6/1–22) and all subjects signed informed consent form. The association between MS and composite indexes—Disease Activity Score 28 (DAS28), Simplified Disease Activity Index (SDAI), and Clinical Disease Activity Index (CDAI)—were analyzed using the SPSS version 24.

Results: The average age of the patients. 73.2% of whom were women, was 55.8 y. No MS was experienced by 28.6% of the sample, while 66.1% and 5.4% felt it for up to 2 h and for more than 2 h after waking up, respectively. The average DAS28 score was 2.92 and was statistically significantly related to the MS duration ($p < 0.001$). About half (52.2%) of all patients in remission based on this scale did not report MS, while the majority with low (78.6%) and moderate (83.3%) disease activity experienced MS for up to 2 h upon waking. The average CDAI score was 11.79 and was statistically significantly related to MS ($p < 0.01$). Most patients with low (57.1%), moderate (89.5%) and high (66.7%) disease activity according to this scale experienced MS for up to 2 h upon waking. The average SDAI score ($M = 12.14$) was also in a statistically significant relationship with MS ($p < 0.01$). MS up to 2 h was reported by the majority of patients with low (60.7%), moderate (81.8%) and high (66.7%) disease activity based on this scale. None of the subjects in remission suffered from morning stiffness.
Conclusion: RA patients receiving biological therapy, who are in remission or have low disease activity, experience no or mild morning stiffness.

P1247
BODY MASS INDEX AS A PREDICTOR OF PHYSICAL ACTIVITY AVOIDANCE

J. Zvekic-Svorcan[1], J. Krasic[2], A. Cvetinovic[2], A. Mikic[3], T. Nikolic[4], T. Jankovic[1], K. Boskovic[1]

[1]Univ. of Novi Sad, Faculty of Medicine Novi Sad, Special Hospital for Rheumatic Diseases, Novi Sad, [2]Univ. of Novi Sad, Faculty of Medicine Novi Sad, Novi Sad, [3]Univ. of Belgrade, Faculty of Philosophy, College of Social Work, Belgrade, [4]Special Hospital for Rheumatic Diseases, Novi Sad, Serbia

Objective: To investigate the role of BMI in the physical activity involvement.
Methods: The sample for this prospective cross-sectional study comprised 103 adult outpatients (aged 18 − 65 y) of both sexes treated at the Special Hospital for Rheumatic Diseases Novi Sad, Serbia. Upon the approval of the Institutional Review Board (14/01–9/1–23), the participants gave their informed consent in writing and were subjected to the weight, height, and waist circumference measurements, allowing their BMI (kg/m^2) to be calculated. All participants also completed The Functional Assessment of Chronic Illness Therapy—Fatigue Scale (FACIT-F) as well as the International Physical Activity Questionnaire (IPAQ). Categorical data were reported as frequencies and percentages, and numerical data were presented as arithmetic means and standard deviations, along with their full range of values. The predictive capacity of BMI was assessed via univariate logistic regression and univariate linear regression analyses, whereby $p \leq 0.05$ was considered statistically significant. All analyses were performed in SPSS ver. 24.
Results: Majority of the participants were women (84.5%), and the average age and BMI was 54.18 y and 28.16 kg/m^2, respectively, with the waist circumference in the 58.0 − 122.0 cm range. According to the BMI, 33.0% of the sample was of normal weight, 32.0% was overweight, 21.4% was obese, and 13.6% was morbidly obese. Based on their IPAQ scores, the physical activity of 68.0% of the respondents was low, while being moderate and high in 28.2% and 3.9% of the cases, respectively. The average self-reported fatigue level of 14.43 suggests that most of the participants do not have fatigue issues, which are unrelated to the BMI ($\beta = 0.153$, $p = 0.122$; CI 95%: [-0.066, 0.555]). On the other hand, those with higher BMI are statistically significantly less likely to partake in physical activities (OR = 0.926, $p = 0.032$, CI 95%: [0.862, 0.993]).
Conclusion: While BMI is unrelated to self-perceived fatigue, it is a significant predictor of physical activity avoidance.

P1248
INFLUENCE OF COMORBIDITIES ON FATIGUE AND PHYSICAL ACTIVITY AVOIDANCE

J. Krasic[1], A. Cvetinovic[1], J. Zvekic-Svorcan[2], T. Nikolov[3], D. Mikic[4], K. Boskovic[2]

[1]Univ. of Novi Sad, Faculty of Medicine Novi Sad, Novi Sad, [2]Univ. of Novi Sad, Faculty of Medicine Novi Sad. Special Hospital for Rheumatic Diseases, Novi Sad, [3]Special Hospital for Rheumatic Diseases, Novi Sad, [4]Univ. of Defence, Medical Faculty of the Military Medical Academy, Military Medical Academy, Pathology and Forensic Medicine Institute, Belgrade, Serbia

Objective: To investigate the impact of comorbidities on fatigue and physical activity avoidance.
Methods: This prospective cross-sectional study, which was approved by the Institutional Review Board (14/01–4/1–23) of the Special Hospital for Rheumatic Diseases in Novi Sad, Serbia, involved 103 outpatients of both sexes aged 18–65 y treated at this clinic. After signing the informed consent form, the participants completed the International Physical Activity Questionnaire (IPAQ) and The Functional Assessment of Chronic Illness Therapy—Fatigue Scale (FACIT-F), along with a questionnaire designed for this study to obtain information on their sex, age, menopause onset, and presence of comorbidities. The gathered data was analyzed using the SPSS ver. 24, whereby frequencies and percentages were used for categorical variables, while arithmetic means and standard deviations with ranges were reported for numerical variables. In addition, univariate logistic regression and univariate linear regression were performed to determine if presence of comorbidities is a statistically significant predictor of fatigue and sedentary lifestyle.
Results: The average age of the sample was 54.18 y. Among the 103 participants, 87 (84.5%) were women, with an average age at the menopause onset of 48.02. While comorbidities were reported by 66.0% of the respondents, at 43.7%, hypertension was the most prevalent. Although the average self- reported fatigue level of 14.43/52 was low, 70 (68.0%) of the sample reported low physical activity levels, while 29 (28.2%) were moderately and 4 (3.9%) were highly physically active. Further analyses indicated that presence of comorbidities was not a statistically significant predictor of physical activity avoidance (OR = 0.559, $p = 0.168$, CI 95%: [0.244, 1.278]) or fatigue ($\beta = 0.157$, $p = 0.114$; CI 95%: [- 0.752, 6.922]).
Conclusion: Presence of comorbidities does not influence the self-perceived fatigue and propensity for physical activity avoidance.

P1249
FATIGUE AS A PREDICTOR OF PHYSICAL ACTIVITY LEVEL

A. Cvetinovic[1], J. Krasic[1], J. Zvekic- Svorcan[2], T. Nikolov[3], A. Mikic[4], K. Boskovic[2]

[1]Univ. of Novi Sad, Faculty of Medicine Novi Sad, Novi Sad, [2]Univ. of Novi Sad, Faculty of Medicine Novi Sad. Special Hospital for Rheumatic Diseases, Novi Sad, [3]Special Hospital for Rheumatic Diseases, Novi Sad, [4]Univ. of Belgrade, Faculty of Philosophy, College of Social Work, Belgrade, Serbia

Objective: To investigate the impact of fatigue on the propensity toward physical activity avoidance.
Methods: This prospective cross-sectional study involving 103 male and female outpatients aged 18–65 y was conducted at the Special

Hospital for Rheumatic Diseases in Novi Sad, Serbia. Prior to commencing the investigations, approval was obtained from the Institutional Review Board (14/01–6/1–23) and all participants signed the informed consent form. Participants' age, sex, physical activity frequency, impact of physical activity participation on mood, typical bedtime, and average daily nap duration was gathered via a questionnaire designed specifically for this purpose. All respondents also completed the International Physical Activity Questionnaire (IPAQ) as well as The Functional Assessment of Chronic Illness Therapy—Fatigue Scale (FACIT-F). The obtained data was analyzed using the SPSS ver. 24, whereby categorical variables were reported as frequencies and percentages, while arithmetic means and standard deviations with ranges were used for numerical variables. Univariate logistic regression was performed to establish whether fatigue is a statically significant predictor of physical activity involvement at the $p \leq 0.05$ level of significance.

Results: At 84.5%, most of the analyzed sample (average age 54.18 y) were women, with 42.3% of the participants indicating that they partake in some form of physical activity 1–3 times per week. In only 3.9% of the cases, the self-reported physical activity level was high, and 91.3% individuals indicated that engagement in physical activity affected their mood. The most common bedtime was 22:00 ($\pm$ 4 h), with an average 60-min nap taken during the day. Although the average fatigue level (14.43 ± 9.36 based on a $0 - 52$ scale) was low, fatigue emerged as a statistically significant predictor of physical activity avoidance in this cohort (OR = 0.954, p = 0.036, CI 95%: $0.912 - 0.997$).

Conclusion: Fatigue level is negatively correlated with the likelihood of physical activity participation.

P1250
ENHANCING FRAGILITY FRACTURE TRACKING: ALGORITHMIC INTEGRATION OF REGISTER AND RADIOLOGICAL VISITS DATA

T. Nissinen[1], R. Sund[2], S. Suoranta[3], H. Kröger[3], S. Väänänen[1]

[1]Kuopio Univ. Hospital, Univ. of Eastern Finland, [2]Univ. of Eastern Finland, [3]Kuopio Univ. Hospital, Kuopio, Finland.

Objective: To evaluate how comprehensively fragility fractures can be tracked from the national medical registers, and to propose algorithmic methods for complementing the register data using time stamps of radiography visits recorded in the radiological image archive.

Methods: For the Kuopio Osteoporosis Risk Factor and Prevention Study (OSTPRE) cohort of 14,220 postmenopausal women, we analysed the data from the Care Register for Health Care, Register for Primary Health Care Visits, self-reports, radiological image archive, and patient records to identify the distal forearm and proximal humerus fractures that occurred between 2011–2021. Using this gold standard of fracture information, we validated the coverage of the registers and image archive and created algorithms to automatically identify fracture events from the registers and/or metadata of radiography visits.

Results: We show that distal forearm fractures and proximal humerus fractures cannot be comprehensively identified based on national registers only. To remedy this, we developed a straightforward algorithmic approach for improving the identification of these fracture types. In distal forearm fractures, our proposed method of combining register and image archive data lifted the coverage from 81 to 94% and reduced false discoveries from 6 to 2%. In proximal humerus fractures, the coverage remained at 73%, but the false discovery rate was reduced from 8 to 4%.

Conclusion: The proposed method offers a more reliable way of gathering fracture information from large retrospective datasets without manual review. Comprehensive fracture identification is essential in many research settings, such as incidence statistics, prevention studies, and the development of new risk assessment models.

P1251
PROSPECTS OF USING AUTOLOGOUS AND ALLOGENEIC BONE MARROW-DERIVED MESENCHYMAL STEM CELLS IN THE TREATMENT OF KNEE OSTEOARTHROSIS

M. Bazarov[1], T. Omelchenko[1], Y. Sobolevsky[1]

[1]Dept. of Traumatology and Orthopedics of the Bogomolets National Medical Univ., Kyiv, Ukraine

Objective: Through a systematic literature review, to explore the safety and effectiveness of treating osteoarthrosis (OA) using autologous and allogeneic mesenchymal stem cells derived from bone marrow (BM-MSC).

Methods: The search for original clinical studies on the use of autologous and allogeneic MSCs published in the last 10 y in English was conducted in the PubMed and Google Scholar databases using the key words (mesenchymal stem cells) (osteoarthrosis or osteoarthritis) (clinical studies) (cartilage regeneration). PRISMA guidelines were followed during the selection of articles.

Results: Based on the selection criteria, 14 clinical trials were identified, covering 429 patients with knee OA, mean age 55.6 y. They divided into 226 patients (153 women, 73 men) who received intra-articular injections of autologous BM-MSCs (from 2×10^6 to 1×10^8) and 203 patients (116 women, 87 men) who received intra-articular injections of allogeneic BM-MSCs (from 25×10^6 to 3×10^7). Patients were observed from 6 months to 2 y and were evaluated clinically, with MRI examination and WOMAC, VAS, Lequesne, KSS indicators. In addition, an analysis of the safety of MSC was carried out. Studies show that intra-articular injection of autologous and allogeneic MSCs leads to clinical and radiological improvements in patients with OA, such as reduced pain, improved joint mobility and regeneration of damaged tissues. High doses of MSCs show a more significant therapeutic effect, but can lead to adverse reactions in patients. The most common side effects usually included knee discomfort and swelling.

Conclusion: The use of autologous and allogeneic MSCs derived from bone marrow has proven to be an effective method for treating OA, capable of regenerating cartilage tissue and alleviating symptoms. Autologous and allogeneic MSCs showed a dose-dependent effect, so further studies are needed to establish optimal doses and safety. Based on these results, it can be concluded that the use of autogenous and allogeneic mesenchymal stem cells is a promising treatment method for OA, which may improve the quality of life of patients.

P1252
PLANT EXTRACTS HAVE INHIBITORY EFFECT ON RANKL EXPRESSION

T. P. Sataieva[1], V. Y. Malygina[1]

[1] V.I. Vernadsky Crimea Federal Univ., Simferopol, Russia

Objective: Medicinal plant extracts can be successfully taken as part of dietary supplements for preventing the risk of bone tissue destruction over time. Biologically active substances of medicinal herbs can affect the processes of bone formation by stimulating osteoblasts or inhibiting the activity of osteoclasts, which is important for the prevention of osteoporosis in women in the climatic period. The aim was to find most promising anti-resorptive herbal extracts.

Methods: The bioassay involved testing plant samples for the ability to inhibit RANKL expression under inflammatory conditions. These studies were performed on MG-63 human osteoblast-like osteosarcoma cells (ATCC, Manassas, VA) cultured in media free of phenol red, a dye with known estrogenic effects. The cells were incubated with plant extracts for 12 h. To induce RANKL expression, human recombinant IL-1β (10 ng/ml) was added to the cell culture. After completion of the incubation period, RANKL mRNA levels were analyzed by quantitative real-time PCR using DLUX primers for human RANKL and Superscript III Platinum reagents from Invitrogen (Carlsbad, CA). The expression level of RANKL was normalized to the expression level of the constitutive GAPDH gene. Values above 10% indicated a significant inhibition of RANKL synthesis. The study was carried out with the financial support of the RSF grant No. 23–15-20,015.
Results: The main factors regulating osteoclastogenesis are inflammatory cytokines and RANKL factor. Increased RANKL expression levels in the postmenopausal period leads to an increase in the number of mature osteoclasts. Increased expression of RANKL leads to the development of degenerative diseases of the musculoskeletal system, including rheumatoid arthritis and osteomyelitis. In contrast, substances that reduce RANKL activity increase bone density, volume, and strength. According to the obtained results the extracts from Gingko biloba – 31%, Rehmannia spp. – 74%, Siberian ginseng – 50% and Sophora japonica – 42% had the greatest activity against RANKL expression. Samples of extracts from pomegranate – 14%, green tea leaves – 19%, grape seeds and a Chinese angelica – 11% and 16%—had a moderate inhibitory effect on RANKL.
Conclusion: Anti-resorptive plant extracts may have an effect on the maintenance of bone mass by preventing excessive calcium loss from the bones. The most effective were pomegranate extract and grape seed extract. According to our observations, their use is accompanied by a decrease in the level of RANKL expression, which, in turn, can lead to inhibition of osteoclast activity and bone tissue destruction, therefore they can be used by peri- and postmenopausal women to maintain bone health.

P1253
FREQUENCY OF VITAMIN D INTAKE IN PATIENTS WITH INCOMPLETE SYSTEMIC LUPUS ERYTHEMATOSUS

T. Panafidina[1], T. Popkova[1], Y. Gorbunova[1], A. Lila[1]

[1] V.A.Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Often, patients present with clinical symptoms and immunologic abnormalities suggestive of systemic lupus erythematosus (SLE), while not meeting classification criteria yet. This is referred to as incomplete SLE (iSLE). Currently, there are no recommendations for monitoring and therapy of patients with iSLE. The aim of the study was to determine the frequency of vitamin D intake in patients with iSLE in clinical practice.
Methods: iSLE(n = 60) was defined by rheumatologists as clinical diagnosis, not fulfilling ACR or SLICC criteria and had no classification or specific symptoms of other rheumatic diseases. The majority of the iSLE patients were female (97%), aged 38[26–47] y. The median age of iSLE diagnosis was 33[25–42] y, disease duration was 12[2–39] months, 20% of pts had a disease duration of $\geq$ 5 y. The following criteria were evaluated: menopausal status, BMI value and SLE-related factors (age at onset, disease duration, cumulative organ involvement, cumulative serology and ongoing therapy, SLE Disease Activity Index (SLEDAI-2 K) and the Systemic Lupus International Collaborating Clinics damage index (SDI), treatment). Universally, DXA is the mainstay for the diagnosis and monitoring of bone status.
Results: At the onset of iSLE diagnosis, the most patients had clinical and immunological signs–77%, clinical only-15%, immunological only-8%pts. The clinical manifestations were as follows: fever–30%, acute cutaneous lupus–21%, subacute–7%, discoid-2%, panniculitis-3%, non-scarring alopecia–10%, Raynaud phenomenon-5%, oral ulcers–9%, joint involvement–55%, serositis–8%, nephritis–10%, psychosis–5%, migraine–17%, leukopenia–21%, thrombocytopenia–14%, autoimmune hemolysis– 7%. Autoantibody profiles revealed the presence of ANA in 82% cases, anti-dsDNA—in 45%, anti-Sm—none, antiphospholipid antibodies(aPL)–in 36% of patients. Eighteen patients (31%) exhibited low complement. The median disease activity was low—SLEDAI-2 K 2[1–5] score and SDI – 0[0–0] score. Fractures of various localizations were detected in 13% of iSLE patients, osteoporosis (OP) was diagnosed in 5/60 (8%) of patients, menopause—in 23% of patients. Among 5 patients with OP + iSLE, none were taking bisphosphonates, fractures were reported in 1/5 (20%) and menopause in 2/5 (40%). All patients diagnosed with iSLE were given general recommendations by the rheumatologist—smoking cessation, no taking medications that provoke SLE (estrogens and so on), sun protection, regular exercise, balance diet, vitamin D intake. But only 27% of patients with iSLE took the recommended vitamin D regularly.
Conclusion: The potential immunomodulatory role of vitamin D in reducing the risk of progression of iSLE to SLE is attractive and has been discussed by many researchers, but at present no convincing evidence has been obtained. Nevertheless, in real clinical practice, we recommend that all patients with iSLE, including asymptomatic patients (i.e., with immunological disorders only—the "preclinical" variant of iSLE), should take vitamin D on a regular basis.

P1254
LONG-TERM RESULTS OF METAL-ON-METAL TOTAL HIP ARTHROPLASTY

T. Sasaki[1]

[1]Tokyo Metropolitan Ohkubo Hospital, Tokyo, Japan

Objective: Numbers of papers have been published concerning adverse reactions to metal debris (ARMD) following metal-on-metal (MOM) total hip arthroplasty (THA). Some patients who experience ARMD require revision surgery. The aim of this study is to evaluate the long-term results of MOM THA retrospectively.
Methods: We reviewed all patients who underwent THA from January 2007 to December 2015. MOM were used in 37 out of 274 cases (13.5%). PINNACLE cup system were used in 14 cases, and M2a-Taper system were used in 23 cases. The original diseases are 28 osteoarthritis, 5 osteonecrosis, 3 rheumatoid arthritis and 1 rapidly destructive hip coxarthropathy. We investigated the revision rate of each system and cup positions (anteversion and inclination) were assessed. We used CAT scan or MRI to assess aseptic loosening, metal hypersensitivity reactions, and pseudotumor formation.
Results: Six women with osteoarthritis experienced significant localized soft tissue reactions, and revisions were done. The average duration to revision was 41 months (range, 28–63). Of these the revision rate of PINNACLE cup system was 28.6% and of M2a-Taper cup system was 8.7%. There was no significant between these rate ($p = 0.17$ Fisher's exact test). Four patients had no signs nor symptoms, 1 patient complained of anterior thigh dullness and 1 patient had dislocation. The average cup anteversion was 15.7° and the average inclination was 49.2°.
Conclusion: MOM THA had higher incidence of revision due to localized soft tissue reactions. Since this reaction progress asymptomatically, all cases of MOM THA should be assessed periodically using CAT scan or MRI.

P1255
LEVEL OF 25(OH) VITAMIN D IN BLOOD SERUM IN PATIENTS WITH MILD DEGREE HYPERPARATHYROIDSIS

Y. POPENKO[1], T. Shaldybin[2], N. Shadchneva[1], A. Zakharova[1], E. Kuliyeva[1], V. Kaliberdenko[1], K. Kaladze[1]

[1] V.I. Vernadsky Crimean Federal Univ., [2]Medaira Clinic, Simferopol, Russia

Objective: In clinical practice, it is difficult to make a diagnosis in patients with of primary hyperparathyroidism (PHPT) mild degree, a normocalcemic variant of HPT in the absence of visualization of the parathyroid adenoma, and secondary hyperparathyroidism as a result of vitamin D deficiency.
Methods: A retrospective analysis of 215 electronic outpatient records of patients examined to exclude PHPT was carried out. Among those who applied, 97% were women. The patients were divided into 3 groups: the first group – 25 people with a PTH level (Me) of 160.08 pg/ml at age (Iu) 62 y; the second – 55 people with a PTH level of 99 pg/ml at the age of 62 y; the third (control) group consisted of 50 people with a normal PTH level of 52.8 pg/ml at the age of 51 years. In all patients, the blood levels of 25 (OH) D (Architect test system), PTH, total calcium, phosphorus, and alkaline phosphatase were examined. BMI, concomitant diseases (including urolithiasis, peptic ulcer), and incidence of fractures were assessed; Densitometry with assessment of BMD and ultrasound of the parathyroid glands were performed. Individuals with serum calcium levels above 2.9 mmol/l, GFR < 60 ml/min/1.73m^2, and a history of pathological fractures were excluded from these groups.
Results: The contents of 25(OH)D in the first and second groups with different degrees of increase in PTH in the blood did not differ (22.3 ± 5.57 and 21.6 ± 6.57 ng/ml. $p > 0.05$), but in in groups with hyperparathyroidism, the level of 25(OH)D was significantly lower than in the group with normal PTH levels (26.1 ± 7.17 ng/ml ($p < 0.00$). A weak negative correlation was revealed between the content of 25(OH) D and PTH in the blood of all subjects (-0.192 $p < 0.05$). The level of total calcium in the first GPT group was significantly higher (Me) 2.66 mmol/l. In the second group calcium content 2.39 mmol/l did not differ from the control group. In all groups, the level of 25(OH)D negatively correlated with BMI (-0.163, $p < 0.05$) and age (- 0.208, $p < 0.05$) A positive correlation between PTH and age was revealed (0.263, $p < 0.01$).No significant differences with other laboratory parameters were found in our study.
Conclusion: The level of 25 (OH) D in the blood serum was significantly lower in patients with hyperparathyroidism, but no significant difference was found between the first and second groups, which determines the need for functional tests for the differential diagnosis of HPT.

P1256
ASSESSMENT OF BONE METABOLISM IN SUCCESSFUL PANCREAS-KIDNEY TRANSPLANTATIION RECIPIENTS

T. Takayanagi[1], Y. Asada[1], Y. Yoshino[1], H. Sumioki[1], Y. Nakajima-Hasegawa[1], S. Kanie[1], I. Hiratsuka[1], M. Shibata[1], Y. Seino[1], A. Suzuki[1]

[1]Dept. of Endocrinology, Diabetes and Metabolism, Fujita Health Univ., Toyoake, Japan

Objective: Recent advances in immunosuppressive therapy for pancreas-kidney transplantation (SPK) potentiates longer survival of its recipient, and the assessment of long-term effect on bone metabolism is also needed.
Methods: T1DM patients (n = 34, M/F = 11/23, age 46.7 ± 8.7 years old) who underwent pancreas transplantation (PTx) including 28 SPK recipients. All patients were received prednisolone (4.9 ± 0.5 mg/d) throughout the observation period. Lumbar spine (LS) and femoral neck (FN) BMD was examined at baseline, 1 and 2 y after PTx as well as bone turnover markers. Total FN 2D-DXA images were analyzed using 3D-SHAPER^{TM} Software. There were 15 patients with anti-osteoporotic treatment; 9 with denosumab (Dmab group) and 7 with active vitamin D alone (Vit D group), whereas 18 patients were observed without treatment (Control group).
Results: All patients had become insulin-free and free from hemodialysis. At the baseline, the average LS and FN BMD T-scores were -1.35 ± 0.97 and -2.04 ± 0.76, respectively, and 12 patients were categorized as osteoporosis. After 2 y, the percent change from baseline in LS BMD was -3.1%($p < 0.05$) in control group, + 0.6% in Dmab group, and + 0.5% in Vit D group. TBS was not significantly changed in all groups. FN areal BMD (aBMD), trabecular volumetric BMD (vBMD), cortical surface BMD (sBMD), cortical thickness (Cth) decreased in control group, while Dmab and Vit D groups did not change either aBMD, vBMD, sBMD or Cth. There was a significant decrease in serum BAP and TRACP-5b in the Dmab group at 1 year after PTx and serum BAP decreased in Vit D group. The change of areal or volumetric BMD did not correlate with changes of BAP, TRACP-5b, osteocalcin or iPTH.
Conclusion: Bone structure would deteriorate after PTx without treatment and it is unlikely that the change of bone turnover markers have sufficient predictive value for bone loss.

P1257
EFFECTIVENESS OF TREATMENT OF FACET JOINT SYNDROME WITH THE USE OF ELECTRICAL STIMULATION

O. Tarasenko[1], T. Tarasenko[1], D. Rekalov[2]

[1]Kherson State Univ., Dnipro, [2]Zaporizhzhia State Medical and Pharmaceutical Univ., Zaporizhzhia, Ukraine

Objective: To determine the effectiveness of treatment of facet joint syndrome in the lumbar spine with the use of electrical stimulation.
Methods: A study was conducted of patients in whom clinical manifestations of facet joint syndrome in the lumbar spine were confirmed using radiological examination methods (CT, MRI). The level of pain syndrome was assessed on the VAS scale before the start of treatment, one day after treatment, one week and 1 month after the end of treatment. Along with traditional treatment (NSAIDs, muscle relaxants, etc.), applied electrical stimulation to the area of the affected facets in pulse mode, 5–10 min per session every day for a week on the Miosti 1000 device.
Results: The study included 68 patients (32 women and 36 men). The average age was 49.32 ± 0.70 y. 69.11% of patients were overweight. The patients were divided into 2 groups of 34 people. Patients in both groups were prescribed drug therapy with NSAIDs and muscle relaxants. Patients of the first group additionally underwent electrical stimulation of the area of the affected facet joints in a pulsed mode for 5–10 min per session every day for a week using the Miosti 1000 device. Before the procedure, the average pain level according to VAS in patients of the 1st group was 85 ± 2.3 mm, 2nd group—85 ± 4.3 mm. 1 day after the end of treatment, the level of pain in patients of the 1st group was 43 ± 4.4 mm, and in the 2nd group—52 ± 2.5 mm. 7 days after the end of treatment, the pain level was 38 ± 2.9 mm in group 1 and 50 ± 3.2 mm in group 2 of patients. 1 month after the end of treatment and manipulation, the pain level was 39 ± 2.5 mm in group 1 and 49 ± 2.7 mm in group 2.
Conclusion: The facet joint electrical stimulation is effective method in the complex treatment of the lumbar spine pain syndromes.

P1258
THE RESULTS OF ASIA–PACIFIC CONSENSUS MEETING ON LONG-TERM AND SEQUENTIAL THERAPY FOR OSTEOPOROSIS

T. W. Tai[1], C. H. Chen[2], J. S. Hwang[3], C. H. Wu[4]

[1]National Cheng Kung Univ. Hospital, National Cheng Kung Univ., Tainan, [2]Dept. of Orthopedics, Kaohsiung Medical Univ. Hospital, Kaohsiung Medical Univ., Kaohsiung, [3]Division of Endocrinology and Metabolism, Dept. of Internal Medicine, Chang Gung Memorial Hospital, Chang Gung Univ., Linkou, [4]Dept. of Family Medicine, College of Medicine, National Cheng Kung Univ., Tainan, Taiwan

Recognizing the significance of long-term and sequential therapy, the Taiwanese Osteoporosis Association (TOA) organized the "Asia–Pacific Consensus Meeting on Long-term and Sequential Therapy for Osteoporosis" in Taiwan on October 12 and 13, 2023. Endorsed by the Asian Federation of Osteoporosis Societies (AFOS). The experts attending the meeting presented the Asia–Pacific consensus on long-term and sequential therapy for osteoporosis, offering evidence-based recommendations for effective chronic condition management. Emphasizing optimal fracture prevention through an individualized approach, a panel of experts synthesized current literature and clinical expertise to develop 12 consensus statements. Key recommendations advocate for anabolic agents as the first-line treatment for those at very high fracture risk, transitioning to antiresorptive agents post-anabolic therapy. Anabolic therapy remains an option for individuals with new fractures or persistent high risk despite antiresorptive treatment.

The consensus addresses long-term anti-osteoporosis medication goals, recommends first-line treatments for those at very high fracture risk, and outlines the strategic integration of anabolic and antiresorptive agents in sequential therapy approaches. To manage medication-related complications, alternatives are proposed rather than discontinuation. In cases of inadequate response, switching to more potent medications is advised.

The consensus also underscores shared decision-making and the integration of country-specific case management systems, like fracture liaison services. Tailored to the Asia–Pacific region, this guide is a valuable resource for healthcare professionals, contributing to the ongoing evolution of osteoporosis management.

P1259
A SYSTEMATIC REVIEW OF CLINICAL GUIDELINES FOR OSTEOPOROSIS MANAGEMENT IN CHINA

T. Wei[1], L. Xu[2], S. Xiong[2], X. Zhang[3], M. Tian[3], M. Yang[4], Y. Wang[5], M. Chen[6], G. S. Kolt[1], L. Si[1]

[1]School of Health Sciences, Western Sydney Univ., Sydney, Australia, [2]The George Institute for Global Health, Faculty of Medicine and Health, Univ. of New South Wales, Sydney, Australia, [3]School of Public Health, Harbin Medical Univ., Harbin, China, [4]Dept. of Orthopaedics and Traumatology, Beijing Jishuitan Hospital, Beijing, China, [5]Dept. of General Medicine, The Second Affiliated Hospital of Harbin Medical Univ., Harbin, China, [6]Nanjing Medical Univ., Nanjing, China

Objective: To systematically review Chinese guidelines for osteoporosis management with other international guidelines, evaluating the similarities, differences, and conflicts in screening, diagnosis, and management.

Methods: A systematic search of Medline, Embase, Cochrane Library, and Web of Science was conducted for English-language papers. As well, a search of Chinese databases including the China National Knowledge Infrastructure and Wanfang, and the official websites of Chinese academic societies was conducted. The search included documents published up to August 2023. Screening of articles and data extraction were conducted by two independent reviewers. The methodological quality of guidelines was appraised with the Appraisal of Guidelines for Research & Evaluation II (AGREE II). The reporting of the systematic review followed PRISMA.

Results: After screening the 5212 records initially identified, 24 guidelines from 19 clinical societies were deemed eligible for data extraction (3 of which were updated versions of previous guidelines). The included guidelines commonly agreed on the definition and risk factors of osteoporosis, diagnostic criteria, and prevention strategies. There was a lack of consensus, however, on assessing osteoporosis-related fracture risks. Medications such as bisphosphonates were commonly recommended as treatment option in 23 (96%) guidelines. Denosumab, approved for use in China in 2019, was recommended as the first line treatment in 6 out of 9 guidelines that were published after 2019. There were 15 (63%) guidelines that highlighted the importance of traditional Chinese medicine in managing osteoporosis. Compared with clinical guidelines from the National Osteoporosis Guideline Group in the UK, there was a lack of specification in the level of evidence and recommendation in 63% of Chinese guidelines. When evaluating the guidelines using AGREE II, we found that 16 Chinese guidelines (67%) lacked the description of methodologies used in developing these guidelines.

Conclusion: The lack of consensus in guidelines poses a challenge for clinicians in managing osteoporosis in China. A widely accepted guideline that is developed based on the best evidence is needed in the Chinese context.

P1260
CYSTICERCOSIS OF THE BRAIN: CLINICAL CASE

A. Filipovich[1], T. Zagorskaya[2]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, [2]Minsk Regional Children's Clinical Hospital, Minsk, Belarus

A 6-year-old child came to the polyclinic of the Minsk Regional Children's Clinical Hospital with reduced vision in the right eye, converging squint. A decrease in vision was noticed within 0.5 y. Neurological status: active, answers questions correctly. From the side of the cranial nerves—convergent squint of the right eye, amblyopia on the right, dyslalia. Tendon-peristal reflexes D = S. Babinsky's symptom from 2 sides. In the Romberg position, he is stable, he performs the finger-nose test clearly. The gait is steady. There are no changes in the general analysis of blood and urine, and in the biochemical analysis of blood. Examined by an ophthalmologist: the right eye is pale pink, the boundaries are clear, the vessels are not changed, the left eye is without pathology. Diagnosis: atrophy of the optic nerve of the right eye, strabismus converging with the paretic component (OD), vis OD – light perception, OS—1.0. X-ray computed tomography of the brain: In both hemispheres of the brain, many calcifications are determined up to 0.5 cm in diameter. There is an asymmetric (D > S) expansion of the ventricular system (lateral ventricles), with a change in the configuration of the anterior horn of the right lateral ventricle (to spherical), 1.8 × 1.9 cm in transverse dimension. The transparent septum is displaced to the left by 0.5 cm. The rest of the ventricular system is moderately dilated. **Conclusion:** computed tomographic signs of cerebral cysticercosis in the calcification stage. Internal hydrocephalus. Severe deformation of the right lateral ventricle, probably due to the presence of a cysticercus bladder. Ultrasound examination of the abdominal organs—no pathology. In the study of feces – eggs of worms were not found. Was examined by a neurosurgeon. Diagnosis: Consequence of the transferred

neuroinfection. According to CT data of the brain, there is an isolated expansion of the body of the right lateral ventricle without impairment of CSF circulation. Does not need neurosurgical treatment. Examination of an infectious disease specialist—antiparasitic therapy is recommended, albendazone for 10–14 d—15 mg/kg/d in two doses. An ELISA test for antibodies to taenia solium was recommended — the antibodies were determined. Results and its discussion. More often, clinically, cysticercosis of the brain is manifested by a convulsive syndrome. Convulsions can be generalized (with loss of consciousness) and partial (twitching of the limbs without loss of consciousness). Convulsions are often persistent, difficult to stop, pharmacoresistant. Patients are forced to take anticonvulsants for a long time in mono or combination therapy: carbamazepine, depakin, lamictal, topamax. Depending on the leading cerebral disorders, there are 5 main syndromes of this disease: hypertensive, occlusive, epileptic (convulsive), meningoencephalitic and psychopathological. Depending on the localization of the parasite, cysticercosis is distinguished supratentorial (cortex and meninges of the brain, intraventricular and mixed form), subtentorial (IV ventricle, cisterns of the posterior cranial fossa and mixed form) and generalized, a special variant is distinguished—racematous or branched (usually localized in the soft cerebral membranes of the base of the brain and can go to the spinal cord).

Conclusion: Children with a sharp decrease in vision should be examined by a neurologist to exclude brain pathology.

P1261
RARE LYSOSOMAL DISEASES IN NEUROLOGICAL PRACTICE

A. Filipovich[1], T. Zagorskaya[2]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, [2]Minsk Regional Children's Clinical Hospital, Minsk, Belarus

In the neurological department of the Minsk Regional Children's Clinical Hospital, we recently observed 2 cases of lysosomal diseases—glycolipidosis with a predominant lesion of the nervous system: GM2 gangliosis—Tay-Sachs disease, and cerebrosidosis—Krabbe's disease. At the heart of Tay-Sachs disease is a genetically determined disorder of the metabolism of gangliosides, accompanied by their increase in the gray matter of the brain, liver, spleen. The type of inheritance is autosomal recessive, the deficiency of the enzyme hexosaminidase A is determined. The frequency of infantile gangliosidosis is 1: 250,000. Vision decreases and is rapidly lost, a special feature is the "cherry spot", which is translucent vessels at the site of destruction of several layers of the retina.

Here is a brief description of the case. Girl KD, 1 year 5 months, complaints of developmental delay—does not hold her head, does not turn over, does not sit, does not walk, does not talk. From 1 year 4 months, seizures appeared in the form of short-term tremors of the limbs. Twice, up to 1 year 5 months, she was treated in the neurological department due to delayed psychomotor development, was examined by geneticists in order to clarify the diagnosis. Objectively the head is macrocephalic in shape, does not hold the head, the large fontanelle is closed, does not turn over, does not sit, does not walk. Exotropia. Muscle tone is sharply reduced in the limbs, there is no support. Tendon-periosteal reflexes are reduced. R-CT of the brain: The cortex and white matter of the brain are well developed. No foci of pathological density were found in the brain matter. The ventricular system is moderately dilated. The lateral ventricles are symmetrical. The subarachnoid space of the cerebral hemispheres and cerebellum is uniformly expanded to 7 mm. **Conclusion:** CT—signs of mixed hydrocephalus. O. ophthalmologist: does not fix the toy, the direct reaction of the pupils is sluggish. The fundus of the eye: the optic nerve disks are pale, the contour is clear, the vessels are 1: 2 (3), the course is normal. In the macular zone, there is a bright red rounded dystrophic focus, rounded with a whitish corolla. Visible periphery without pathology. Diagnosis: Tay-Sachs disease. Partial atrophy of the optic nerves in both eyes. Results of genetic testing: 1. At the Institute of Genetics and Cytology of the National Academy of Sciences of Belarus (laboratory of nonchromosomal pathology), mitochondrial DNA was analyzed for the presence of T8993 G mutations (maternal inherited Lee syndrome) and A3343 G (MELAS syndrome), as well as for the presence of large deletions of MT DNA. PCR analysis of DNA samples isolated from leukocytes was carried out. According to the results of DNA analysis, these violations of the mitochondrial genome were not revealed. 2. Activity of lysosomal enzymes in leukocytes: decreased activity of β-hexosaminidase A: 10.7; 7.2 mmol/g/mg of protein (norm 180–470). Diagnosis: GM2—gangliosidosis. Tay-Sachs disease. The risk of having a child with such diseases in the family is 25%—high. Material from a sick girl and her parents was sent for DNA research to the Medical Genetic Research Center of the Russian Academy of Medical Sciences, Moscow—a partial analysis of the HEXA gene (Tay-Sachs disease, H1H 272800). Treatment is symptomatic, specific enzyme replacement therapy has not been developed. The girl received anticonvulsants: depakin, carbamazepine, topamax, as well as diacarb, asparkam, emoxipin.

Five years ago, another girl with a diagnosis of globoid cell leukodystrophy—Krabbe's disease underwent inpatient treatment twice in the neurological department of the ultrasound department of the Moscow Regional Children's Clinical Hospital. The child was admitted at the age of 3 months with complaints of delayed psychomotor development, constant unmotivated cry, malnutrition, then myoclonic convulsions appeared. The objective status was spastic tetraparesis, increased tendon-periosteal reflexes, pseudobulbar disorders, muscle hypertension, which was later replaced by hypotension. The disease progressed, due to a violation of swallowing, the child suffered aspiration pneumonia. According to a decrease in the activity of the enzyme galactosylceramide-β-galactosidase in the medical genetic center of Minsk, the diagnosis was made—Krabbe's disease. At the age of 1, the girl died. The type of inheritance of Krabbe's disease is autosomal recessive.

To date, there are enzyme replacement drugs for the treatment of a number of extremely rare diseases: mucopolysaccharidosis—types 1,2,6, Gaucher disease, Fabry disease, Pompe syndrome, but in case of brain damage, there is no enzyme therapy, since the drugs do not penetrate the blood–brain barrier. Intensive clinical research is underway around the world to develop effective enzyme replacement therapy.

P1262
BABY-SHAKEN SYNDROME

T. Zagorskaya[1], A. Filipovich[2]

[1]Minsk Regional Children's Clinical Hospital, Minsk, [2]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Shaking baby syndrome – injuries caused to the baby as a result of strong shaking. In total, there are about 27 cases of Baby-Shaken syndrome per 100,000 infants worldwide. Most often, the culprits of shaking are fathers and stepfathers (68–83%), followed by nannies (8–17%) and mothers (9–13%). A constantly crying child can infuriate even a well-balanced adult. A few sudden movements are enough for a child to get a serious injury. The head of a child under the age of one year is too large for a weak neck, it swings intensely and abruptly. Blood vessels can be damaged, leading to hemorrhages, due to the immaturity of the brain, the processes of nerve cells, which

in children are not protected by the membrane, break off when shaken. In case of rough shaking of the baby, it is possible to separate the spinal cord from the brain at the level of the brainstem. The visual apparatus in infants is often affected, which is associated with the movement of the layers of the retina of the eye relative to each other. The classic triad of shaken baby syndrome is intracranial hemorrhage (predominantly subdural hematomas), cerebral edema, retinal hemorrhage. In 25% of cases, the shaking syndrome ends in the death of the infant from damage to vital brain centers, severe spinal injuries in the cervical spine. Complications of shaking syndrome include cortical blindness, hydrocephalus, convulsive seizures, cerebral palsy, delayed psychospeech and motor development, learning disabilities, and mental retardation. In the mildest cases, symptoms of severe brain dysfunction remain. In the clinic, we observed a case of Baby-Shaken syndrome in a 4-month-old child. The child was born from a second pregnancy due to grade 1 gestational anemia, colpitis, chronic nicotine intoxication, second vaginal birth at 37 weeks with a weight of 3.100 g. The child's father is 53 years old, the mother is 29 years old, the mother suffers from epilepsy. From the age of 2 months, the baby began to hold his head.

At the age of 4 months, the child was admitted to inpatient treatment with complaints from the parents of a short-term loss of consciousness against the background of crying, similar to a respiratory affective attack. During the examination of the child, no data on cranial nerve damage were revealed, tendon-periosteal reflexes were not altered, a large fontanelle 1.5 × 1.5 cm, not strained. He holds his head while lying on his stomach well. Support on the forefoot. No changes in blood tests were detected. The child underwent an ultrasound of the brain—an echo picture of a subdural ganglion cyst on the right, an X-ray of the skull in 2 projections—no violation of the integrity of the bones of the cranial vault was revealed. The child underwent an MRI of the brain, revealed subacute chronic subdural liquor-hemorrhagic clusters over both hemispheres of the brain and cerebellum in varying degrees of resolution, the largest in the frontal region—12 mm thick, in the posterior cranial fossa 2–3 mm thick with a shift of the median structures to the right at the level of the ventricles by 1.5–2 mm without compression of the brain. Mild expansion of the subarachnoid convexital and cisternal spaces of the brain. The ventricles of the brain are not dilated or deformed, the anterior horns of the lateral ventricles are at the level of the foramen of Monroe 6 and 4 mm, the width of the third ventricle is 5 mm, the width of the fourth ventricle is 12 mm. There is no occlusion of the cerebrospinal fluid pathways. He was examined by a neurosurgeon and diagnosed: Bilateral subdural cerebrorogemorrhagic clusters (Baby-Shaken syndrome). Given the absence of focal symptoms and signs of intracranial hypertension, surgical treatment is not currently required. Conservative treatment with glycine and magnetab was carried out. Examined by a VisOD|OS-object vision, the optic nerve discs on the fundus of the eye are normal, no pathology was detected at the time of examination. The child's parents are registered as socially dangerous, for more frequent visits by the district pediatrician and visiting nurses. The inadmissibility of rough shaking and other options for careless treatment of children, the involvement of relatives in caring for the baby, and the help of psychologists are explained.

P1263
TAY-SACHS DISEASE: CLINICAL OBSERVATION

T. Zagorskaya[1], A. Filipovich[2]

[1]Minsk Regional Children's Clinical Hospital, Minsk, [2]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Tay-Sachs disease is based on a genetically determined disorder of ganglioside metabolism, accompanied by their increase in the gray matter of the brain, liver, and spleen.

Girl K.D., 1 year 5 months, complaints of developmental delay – does not hold her head, does not roll over, does not sit, does not walk, does not talk. From 1 year and 4 months, attacks appeared in the form of short-term trembling of the limbs. Twice up to 1 year and 5 months, she was treated in the neurology department due to delayed psychomotor development, examined by geneticists in order to clarify the diagnosis. Objectively: the head is macrocephalic, does not hold the head, the large fontanelle is closed, does not turn over, does not sit, does not walk. Divergent strabismus. Muscle tone is sharply reduced in the extremities, there is no support. Tendon-periosteal reflexes are reduced. **Conclusion:** CT scan – signs of mixed hydrocephalus. O. ophthalmologist. Diagnosis: Tay-Sachs disease. Partial atrophy of the optic nerves in both eyes.

Genetic test results: 1. At the Institute of Genetics and Cytology of the National Academy of Sciences of Belarus (Laboratory of Non-Chromosomal Pathology), mitochondrial DNA was analyzed for the presence of mutations T8993 G (maternal inherited Leigh syndrome) and A3343 G (MELAS syndrome), as well as for the presence of large MT DNA deletions. PCR analysis of DNA samples isolated from leukocytes was performed. According to the results of DNA analysis, these mitochondrial genome disorders were not revealed. 2. Activity of lysosomal enzymes in leukocytes: decreased activity of β-hexosaminidase A: 10.7; 7.2 mmol/g Diagnosis: GM2 – gangliosidosis. Tay-Sachs disease. The risk of having a child with such diseases in a family of 25% is high. The material of the sick girl and her parents was sent for DNA testing to the Research Center for Medical Genetics of the Russian Academy of Medical Sciences in Moscow—a partial analysis of the gene HEHA (Tay-Sachs disease, H1H 272800). Treatment is symptomatic, specific enzyme replacement therapy has not been developed. The girl received anticonvulsants: depakine, carbamazepine, topamax, as well as diacarb, asparkam, emoxypine.

P1264
STROKE IN CHILDREN: CLINICAL CASE

A. Filipovich[1], T. Zagorskaya[2]

[1]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, [2]Minsk Regional Children's Clinical Hospital, Minsk, Belarus

Stroke occurs not only in adults, but also in children, the frequency of its development in children ranges from 0.2 to 79 cases per 100,000 children, depending on the territory and time of registration, and ranges from 55–70% of the total number of all types of strokes. There is no gender difference, however, many experts note that boys are slightly more likely to suffer among children under 3 years old, and girls are more likely to suffer among schoolchildren and adolescents.

The main causes of stroke in children are heart diseases-congenital heart defects, diseases of the blood system and coagulopathy, cerebrovascular malformations, Moya-Moya disease, vasulitis, hereditary and acquired vasculopathy, homocysteinuria, compression of the vertebral artery, autoimmune diseases. In 1998, focal cerebral arteriopathy was first described, which is currently one of the most common causes of stroke in children. Focal transient cerebral arteriopathy is an acquired arteriopathy (due to acute intestinal infection, streptococcal infection), damage to the junction area of the distal portion of the internal carotid artery, as well as the proximal sections of the middle and anterior cerebral arteries, associated with stroke in the basal nuclei of the brain. One of the main causes of stroke in children is head trauma. 9–23% of cases of stroke in children are cryptogenic. Even a slight fall from the sofa to the carpet provoked the development of a stroke in a child.

A 1-year-old girl was treated at the Minsk Regional Children's Clinical Hospital with a diagnosis of strokein the basin of the left middle cerebral artery (basal nuclei), probably due to a minor head injury, with pronounced right-sided hemiparesis, lower prosoparesis, acute period. Concomitant diseases: mild anemia of mixed genesis. Acute respiratory infection, rhinopharyngitis. A minor abnormality of the heart development: a functioning oval window, an additional chord of the left ventricle, circulatory insufficiency of the 0 degree. Upon admission to the intensive care unit, the child's condition is serious. There was weakness in the right limbs, the right arm was falling, and there was almost no support on the right leg. MRI of the brain was performed on the girl: In the basal nuclei of the left hemisphere (shell, posterior femur of the inner capsule, partially the head and body of the caudate nucleus), a site of cytotoxic edema without blood metabolites measuring 20 × 18x23mm is determined. Incomplete myelination in the subcortical and periventricular white matter of the cerebral hemispheres. The ventricles and subarachnoid spaces are not expanded or deformed. The anterior horns of the lateral ventricles at the level of the Monroe orifice are 5 mm; the width of the third ventricle is 3 mm; the width of the fourth ventricle is 12 mm. The median structures are shifted to the right by 3 mm. There is no occlusion of the cerebrospinal fluid pathways. Structures of the facial skull: swelling of the mucous membranes of the cells of the latticed bone and maxillary sinuses on both sides, enlarged pharyngeal tonsils. Structures of the base of the skull: the pituitary gland is located intracellularly, measuring 7 × 3x9mm, the pedicle is not displaced, the posterior lobe is differentiated, the structure is homogeneous. Structures of the posterior cranial fossa: pneumatization of the pyramids (middle ear) and mastoid processes on both sides is reduced, due to a slight swelling of the mucous membranes. Magnetic resonance angiography (TOF): without signs of thrombosis of the arterial main vessels of the base of the brain and their visualized branches. The posterior trifurcation of the left internal carotid artery, deviation of the basilar artery and V4 segments of both vertebral arteries is determined; the formation of a transverse sinus on the left from the upper sagittal and rectus sinus, and a transverse sinus on the left from the upper sagittal sinus.

Conclusion: Acute ischemia in the basal nuclei of the left hemisphere of the brain without signs of thrombosis of the arterial main vessels of the base of the brain. Swelling of the mucous membranes of the paranasal sinuses. The child underwent coagulogram, blood and urine tests, biochemical blood analysis, blood tests for autoimmune diseases, congenital thrombophilic mutations, and the content of homocysteine in the blood was determined. Markers of autoimmune diseases: ANA—otp., a/b2-glycoprotein Ig M—otp, a/cardiolipin Ig M—otp, a/cardiolipin Ig G—otp. Congenital thrombophilic mutations, FV Leiden—otp, FII G 20210A—otp. The child was examined by a hematologist: no hematological cause of ischemic heart attack was revealed in the volume of studies performed. An ultrasound examination of the heart was performed: a functioning oval window with a left–right shunt. The dimensions of the chambers and walls of the heart are normal. The valvular apparatus of the heart without structural changes. Regurgitation of the 0–1 degree on the tricuspid valve, pulmonary artery valve. Movable Chiari network of the right atrium cavity. False chord in the cavity of the left ventricle. There is no free fluid in the pericardial cavity. The contractile function of the myocardium of the left ventricle is satisfactory. Ultrasound examination of the vessels of the lower extremities—veins of both lower extremities of normal anatomy, passable, diameters within the age norm, no intraluminal neoplasms were detected, compression by the sensor is complete, blood flow rates are within the normal range. The child was consulted by a cardiosurgeon of the State Institution "RNPC of Pediatric Surgery": The closure of the existing functioning window can be shown if its connection with the development of a stroke is established. This is possible only in the presence of a right-left shunt at the level of an open oval window (paradoxical embolism), as well as an embolism substrate (in adult patients, these are blood clots in the varicose veins of the lower extremities).Given the lack of indications for surgical closure of a functioning oval window, the latter is currently not indicated. The girl received nootropic, vascular drugs, antioxidants in the treatment: ceralin, emoxypine, cytoflavin, vinpocetine, as well as for 1 month -a direct-acting anticoagulant—fragmin under the control of anti-Xa, which was canceled due to the exclusion of hereditary thrombophilia. Due to anemia, she received an iron-containing drug-ferrum FT, as well as folic acid. Physical therapy and massage were started early. As a result of the treatment, after 1 month, the strength in the right limbs was almost completely restored, the girl began to take toys with her hands, turn on the light, and after 3 weeks she began to walk independently. After 1.5 months, she underwent a second course of rehabilitation on the basis of the neurological department: medication with neuroprotectors, acupuncture, electrical stimulation, paraffin, ozokerite applications on the right extremities, physical therapy, massage. As a result, right-sided hemiparesis and lower prosoparesis regressed. The girl is on the dispensary register with a neurologist at her place of residence, if necessary, a hematologist's consultation is indicated, and MRI of the brain is monitored.

P1265
REHABILITATION OF CHILDREN WITH CEREBRAL PALSY AND CONVULSIVE SYNDROME AT THE MINSK REGIONAL CHILDREN'S CLINICAL HOSPITAL

T. Zagorskaya[1], A. Filipovich[2]

[1]Minsk Regional Children's Clinical Hospital, Minsk, [2]National Science and Practice Centre of Medical Assessment and Rehabilitation, Yukhnovka, Belarus

Children with cerebral palsy (ICP) undergo courses of rehabilitation: medication and physiotherapy, massage repeatedly, sometimes up to 10 courses on the basis of the neurology departments of the Minsk Regional Children's Clinical Hospital (MRCH). Comprehensive rehabilitation is aimed at restoring motor functions, normalizing muscle tone, normalizing or developing weakened or absent innate motor reflexes (stepping, protective, head-to-body, head-to-head reflex, support reflex), teaching the skills of sitting, standing, walking, manipulative activity, and speech functions. In the presence of convulsive syndrome, the selection of anticonvulsants is carried out: carbamazepine, depakine, convulsofin, lamictal, topamax, clonazepam in mono- or in case of ineffectiveness in duotherapy. The presence of convulsive seizures in a patient with cerebral palsy is a contraindication to physiotherapeutic treatment (FTL), therapeutic exercise (exercise therapy), massage, drug treatment has a number of limitations—a number of nootropic drugs that can provoke convulsive seizures are contraindicated: nootropics (aninalone, cerebrolysin, encephalobol, piracetam), anticholinesterase drugs: proserin,

neuromidine. Of the nootropic and vascular drugs, pantogam, gliatilin, cortexin, actovegin, emoxipine, mexibel, glycine, B vitamins (neurobex, magne-B6), vitamin E, muscle relaxants (midocalm) are used. In the absence of convulsive syndrome in children with cerebral palsy for 3 months, the patient begins to undergo FTL, exercise therapy, massage, acupuncture against the background of taking anticonvulsants. Anticonvulsants are taken for a long time – 2–3 y after the last attack. Massage is of particular importance for the treatment of cerebral palsy, the work with each muscle group should be approached selectively, taking into account its tone, the presence of contractures in the joints. Physiotherapeutic treatment includes electrotherapy: electrical stimulation of the back muscles, foot extensors, thigh muscles, buttocks; Phototherapy: UV, laser therapy, polarized light therapy, ultrasound therapy and drug phonophoresis: euphylline-dibazole biphoresis on the limbs and segments of the spinal cord, heat therapy (paraffin-ozokerite applications), hydrotherapy: hydromassage, whirlpool baths, reflexology.

As of January 1, 2012, there are 857 children with cerebral palsy in the Minsk region. In 2011, 226 patients with cerebral palsy (29.65% of morbidity) were treated at the Neurology Department. 47 case histories of children with cerebral palsy who underwent treatment in 2011 were analyzed. Convulsive seizures were observed in 18 patients (38%) In 3 patients (6%) children with cerebral palsy, convulsive seizures in the stage of drug remission (that is, they regularly take anticonvulsants), sulorogenic seizures were noted during the rehabilitation treatment, as a result of which rehabilitation by physiotherapeutic methods, massage was stopped, only permissible drug treatment was preserved.

P1266
IMPACTS OF ADHERENCE OF DENOSUMAB ON KIDNEY FUNCTION AND ALL-CAUSE MORTALITY IN TYPE 2 DIABETIC PATIENTS

T.-C. Lee[1], C.-H. Chen[2], P.-S. Ho[3]

[1]Dept. of Orthopaedics, Kaohsiung Medical Univ. Hospital, Kaohsiung Medical Univ., [2]Dept. of Orthopaedics, Kaohsiung Municipal Ta-Tung Hospital, Kaohsiung Medical Univ., [3]Dept. of Oral Hygiene, Kaohsiung Medical Univ., Kaohsiung, Taiwan

Objective: Patients with type 2 diabetes mellitus (T2DM) have many comorbidities, including osteoporosis. Hyperglycemia may directly suppress osteoblast-mediated bone formation which then increases susceptibility to fracture. Although previous studies revealed that denosumab seemed safe for osteoporotic patients with T2DM, the treatment adherence, renal function change, and mortality rate after treatment remain unclear.
Methods: A retrospective cohort study was conducted using an electronic health record database. New denosumab users between 2010–2017 were identified. After excluding type 1 DM, other prevalent osteoporotic drugs users, subjects with malignancy diagnosis, and died within 2 y after the index date, 536 subjects were analyzed according to their 2-y drug adherence. The one-year average estimated glomerular filtration rate (eGFR) was calculated. We defined high adherence (HA) users as receiving three or four doses and low adherence (LA) users as receiving one or two doses. All-cause mortality was analyzed by Kaplan–Meier curve and Cox regression model to compare denosumab users with HA and LA groups.
Results: We enrolled 536 subjects in the overall cohort (286 in HA group; 250 in LA group). Decline of eGFR was observed in both cohort subjects after denosumab initiation. There is no renal function difference between these two groups. The all-cause mortality rate of the HA groups is significantly lower than the LA groups, with an adjusted hazard ratio of 0.52 (CI = 0.29–0.92).
Conclusion: New denosumab users with T2DM showed decline of renal function status after treatment regardless of medication adherence. HA users may have a significantly reduced all-cause mortality risk in comparison of LA users without significant renal function decline.

P1267
EFFECT OF AEROBIC EXERCISE ON KINESIOPHOBIA AND FATIGUE IN RHEUMATOID ARTHRITIS PATIENTS

N. V. Aleksandrova[1], V. A. Aleksandrov[2], I. Y. Alekhina[3], A. V. Aleksandrov[4], M. V. Nikitin[5]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, [2]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd State Medical Univ., the Dept. of Hospital Therapy, Volgograd, [3]Stavropol State Medical Univ., the Dept. of Hospital Therapy, Stavropol, [4]Volgograd State Medical Univ., the Dept. of Hospital Therapy, the Dept. of Laboratory Diagnostic, Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, [5]"Sanatorium-resort complex "Vulan"—Branch Federal state budget institution "National Medical Research Center for Rehabilitation and balneology" of the Ministry of health of the Russian Federation, Gelendjik, Russia

Objective: To evaluate the effect of aerobic exercise (dosed walking) on the level of kinesiophobia and changes in chronic fatigue indices in patients with rheumatoid arthritis (RA).
Methods: 52 outpatients with RA (mean disease activity according to DAS28-ESR was 2.9 [2.1;3.2] points) were included in the study. All RA patients used dosed walking for 4 weeks (daily, duration 30–60 min, taking into account the tolerance of physical activity according to the 6MWD-test) and underwent a twofold questionnaire (before and after the rehabilitation cycle). The VAS screening scale and the BRAF-NRS V2 questionnaire were used to assess fatigue, The Tampa Scale for Kinesiophobia (TSK) was used to assess the level of kinesiophobia, and the 50-m walk test was used to assess the patients' functional status in dynamics.
Results: At the initial examination, the average level of kinesiophobia according to TSK was 72.7 [31;84] points, the average level of fatigue according to VAS was 44.8 [26;57] points. According to the results of questionnaire processing, RA patients were divided by the level of physical activity (by the average number of steps walked per day) into two groups: group I (sedentary lifestyle) included patients with $<$ 5500 steps/d, group II (mobile lifestyle) included patients with $\geq$ 6000 steps/d. There were no intergroup differences in DAS28-ESR activity, VAS pain, 50-m walk test ($p > 0.05$). The presence of kinesiophobia of varying severity (TKS scores from 18–68) was found in 69.2% of RA patients. There were significantly more patients with kinesiophobia in group I compared to group II ($p = 0.007$). In patients with sedentary lifestyle (group I), no significant changes in VAS and BRAF-NRS fatigue scores were registered ($p > 0.05$), but there was a decrease in total TKS scores ($p = 0.036$), mainly due to the psychological component of kinesiophobia. There was a decrease in BRAF-NRS scores on all fatigue scales: NRS severity ($p < 0.001$), NRS-effort ($p = 0.009$) and NRS-overcoming ($p = 0.011$) in the group of RA patients with a mobile lifestyle (group II). There was a decrease in walking time in the 50-m test ($p = 0.027$) and a decrease in the psychological and physical components of TKS ($p < 0.001$).
Conclusion: Aerobic exercises have a positive effect on the functional state of patients with RA, contribute to the reduction of fatigue and kinesiophobia. The use of the TKS technique in RA patients may be required to clarify the prognosis and to draw up an individual rehabilitation plan.

P1268
EFFECTIVENESS OF USING A FUNCTIONAL UNLOADING (VALGUS-VARUS) ORTHOSIS IN OSTEOARTHRITIS AND VARUS DEFORMITY OF THE KNEE JOINT

V. A. Nesterenko[1], M. M. Makarov[1], B. E. Bialik[1], M. S. Makarov[1], K. A. Karateev[1], B. V. Bialik[1], A. S. Arkhipov[1], K. A. Khramov[1], N. E. Naryshkin[1], R. A. Roskidailo[1], M. S. Maglevannyi[1], D. A. Dubinin[1], A. Kargalcev[1], E. Filatova[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Orthosis is one of the widely used methods of conservative treatment of osteoarthritis (OA) of the knee joint (KJ). However, there is relatively little data in the literature on the use of functional, unloading (varus-valgus) orthoses. We aimed to evaluate the effectiveness and safety of the use of a functional, unloading (varus-valgus) orthosis in patients with OA 3st and varus deformity of the knee joint.
Methods: The analysis of the results of using a functional, unloading (varus-valgus) orthosis in 10 patients with OA 3st and varus deformity of the KJ, confirmed by X-ray examination. (30.0% of men and 70.0% of women, average age 64.5 ± 8.9 y, BMI 30 ± 3.4). The inclusion criteria were: osteoarthritis of the knee joint of stage II, III according to Kellgren-Lawrence, established according to clinical and X-ray examination, age from 45 to 85 years, VAS pain ≥ 40 mm. All patients were recommended to use a functional, unloading (varus-valgus) orthosis for 3 months. The orthosis was adjusted four times every 5–7 d during the first month. The result was evaluated according to the data of an outpatient examination and a telephone survey after 1 and 3 months.
Results: Throughout the follow-up period, all patients noted a significant decrease in pain intensity, but the dynamics of functional indicators was minimal. VAS initial value is 49.0 ± 11.3, in the first hour of use 22.0 ± 13.9, after 1 month. 14.0 ± 11.7, after 3 months. 13.0 ± 10.5. KOOS initially, after 1 and 3 months 43 ± 10,3, 58,7 ± 10,6, 60,0 ± 10,6. Against the background of using a functional, unloading (varus-valgus) orthosis of adverse reactions was not noted.
Conclusion: The functional, unloading (varus-valgus) orthosis significantly reduces the intensity of pain starting from the first hour of its use and maintains positive dynamics throughout the wearing of the orthosis.

P1269
EVALUATION OF EFFECTIVENESS OF PERIARTICULAR ADMINISTRATION OF LOW MOLECULAR WEIGHT HYALURONIC ACID PREPARATIONS IN RHEUMATIC DISEASES OF VARIOUS LOCALIZATION

V. A. Nesterenko[1], K. A. Karateev[1], M. M. Makarov[1], B. E. Bialik[1], M. S. Makarov[1], B. V. Bialik[1], Z. V. Zelenov[1], A. S. Arkhipov[1], K. A. Khramov[1], N. E. Naryshkin[1], R. A. Roskidailo[1], M. S. Maglevanniy[1], K. A. Kargaltsev[1], D. A. Dubinin[1], S. V. Stadnik[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Rheumatic pathology of the periarticular soft tissues (RPPT), which includes tendinitis, enteritis, bursitis, tendovaginitis, fasciitis, is a common cause of acute and chronic musculoskeletal pain. Treatment of RPPT is based on the combined use of painkillers, physiotherapy and rehabilitation, as well as local injection therapy (LIT), including the administration of hyaluronic acid (HA). However, there is relatively little data on evaluating the effectiveness of the use of LIT with HA in these pathologies. We aimed to evaluate the efficacy and safety of LIT HA 500–730 kDa in patients with various RPPT.
Methods: The study group consisted of 30 patients with RPPT of various localization (subacromial impingement syndrome (SIS), lateral/medial epicondylitis, plantar fasciitis), 10 people with each pathology. (60.0% of women and 40.0% of men, age 56.1 ± 14.9 y), who underwent LIT with the use of low-molecular-weight HA in the parathyroid region with RPPT of various localization. All patients received 3 injections of low molecular weight HA at an interval of 7 ± 2 d. The inclusion criteria were: Age ≥ 18 y, diagnosed according to clinical and instrumental parameters (ultrasound, MRI) RPPT: SIS, lateral/medial epicondylitis, plantar fasciitis, moderate or severe pain (≥ 40 mm on a visually analog pain scale, VAS 0–100) for more than 3 months, insufficient effect from previous LIT with the use of glucocorticoids, the need for regular administration of nonsteroidal anti-inflammatory drugs. The result of treatment VAS evaluated after 1 and 3 months. according to a telephone survey.
Results: Against the background of therapy, the dynamics of pain and function were distributed as follows: at SIS VAS initial one, after 1 and 3 months was 57,5 ± 15,8, 37,5 ± 13,8, 33,7 ± 14,0, ASES is initial, after 1 and 3 months was 54,2 ± 13,7, 64,5 ± 10,3, 65,5 ± 9,8. With lateral epicondylitis, VAS the initial one, after 1 and 3 months was 54,0 ± 13,4, 35,0 ± 9,7, 34,0 ± 11,0, the Mayo Elbow Score questionnaire is initial, after 1 and 3 months it was compiled 72,0 ± 11,5, 79,2 ± 9,0, 82,7 ± 7,7. In plantar fasciitis VAS, after 1 and 3 months, was 60.0 ± 16,5, 36,6 ± 19,3, 34,4 ± 15,8. Foot Function Index is initial, after 1 and 3 months, was 47,2% ± 22,8, 39,6% ± 29,7, 39,0% ± 29,9. During the study, no one had any adverse reactions with LIT.
Conclusion: Low molecular weight LIT HA are an effective and safe method of treating RPPT of various localization.

P1270
WHAT IS THE ROLE OF INTRA-ARTICULAR INJECTIONS IN RHEUMATIC DISEASES?

V. A. Nesterenko[1], K. A. Karateev[1], M. M. Makarov[1], M. M. Makarov[1], B. E. Bialik[1], B. V. Bialik[1], F. E. Filatova[1], R. A. Roskidailo[1], K. A. Khramov[1], N. E. Naryshkin[1], M. S. Maglevannyi[1], D. A. Dubinin[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: One of the widely used methods of treatment of rheumatic diseases (RD) is intra-articular injections of glucocorticoids (IAI GC). However, there are still many questions about their effectiveness and duration of action. We aimed to evaluate the effectiveness and safety of IAI GC at RD.
Methods: The results of treatment of 290 patients with osteoarthritis (OA) and rheumatoid arthritis (RA) were analyzed (31.0% of men and 69.0% of women, average age 55.6 ± 12.6 y). All received IAI GC in the knee joint according to strict indications determined by the attending physician. The control group consisted of 112 patients with OA (28.6% of men and 71.4% of women, aged 59.3 ± 14.6 y). These patients received a course of IAI hyaluronic acid (HA). The result was evaluated according to a telephone survey after 2 weeks, 1 and 3 months.
Results: After the course of the IAI GC in 2 weeks, 1 month and 3 months. Patients showed a decrease in pain (numerical rating scale (NRS 0–10), Me [25%; 75%]) from 6.0 [4.0; 8.0] to 1,0 [0; 2,0], 2,0 [1,0; 4,0] and 2.5 [1.0; 4.0], respectively ($p < 0.001$). After 3 months, 63.8% of patients with no/mild pain (< 4 NRS), 30.3% with complete/almost complete absence of pain (≤ 1 NRS). The effect of IAI GC was higher in RA than in OA—pain after 3 months -4.0 [-2.0; -6.0] and -2.0 [-1.0; -5.0], p = 0.003. The effectiveness of IAI GC and

HA in OA did not differ: pain after 3 months was -2.0 [-1.0; -5.0] and -3.0 [-1.0; -5.0] p = 0.869. Against the background of treatment, no adverse reactions were noted.

Conclusion: IAI GC are an effective and safe method of temporary treatment of patients with the presence of RA.

P1271
WHICH AGE IS BETTER SUITED TO THERAPY FOR SUBACROMIAL IMPINGEMENT SYNDROME?

V. A. Nesterenko[1], K. A. Karateev[1], M. M. Makarov[1], B. E. Bialik[1], M. S. Makarov[1], R. A. Roskidailo[1], F. E. Filatova[1], S. V. Stadnik[1], K. A. Khramov[1], N. E. Naryshkin[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Periarticular administration of platelet-rich plasma (PRP) and hyaluronic acid (HA) preparations is widely used for chronic pain in the shoulder joint. However, the effectiveness of these drugs in patients of different ages has not been sufficiently studied. We aimed to compare the effectiveness of PRP and HA in patients with chronic shoulder pain associated with subacromial impingement syndrome, depending on age and individual characteristics.

Methods: 100 patients, 54% men and 46% women, aged 51.5 ± 15.1, with shoulder pain (≥ 3 months) caused by subacromial impingement syndrome were examined and treated. Patients < 45 years old accounted for 34%, ≥ 45 years old – 66%. After the examination, the patients were randomly divided into 2 groups. Group 1 received 3 consecutive subacromial injections of PRP with an interval of 7 days, group 2 received 2 consecutive subacromial injections of HA with a similar interval. The dynamics of pain was assessed using a 100 mm visual analog scale (VAS), functional disorders according to ASES (American Shoulder and Elbow Surgeons Assessment) and CSS (Constant Shoulder Score), a decrease in the need to use NSAIDs 6 months after the course of treatment.

Results: The dynamics of pain and functional disorders in the treatment of PRP and HA did not differ. Pain decreased from 56.0 ± 14.6 to 31.8 ± 26.3 and from 57.6 ± 17.8 to 30.2 ± 26.3 (p = 0.768), ASES increased from 54.8 ± 13.8 to 74.6 ± 22.4 and 54.7 ± 15.1 to 77.3 ± 22.5 (p = 0.552), CSS from 59.2 ± 14.4 to 66.9 ± 17.4 and 47.8 ± 16.9 to 65.6 ± 19.3 (p = 0.245). In the treatment of PRP and HA, the dynamics of pain and functional parameters were significantly better in patients < 45 years old than in patients ≥ 45 years old. The pain level according to VAS after 6 months was 22.4 ± 26.3 and 35.5 ± 26.2 (p = 0.022), ASES 83.3 ± 20.9 and 72.1 ± 22.6 (p = 0.017), CSS 76.2 ± 16.1 and 63.2 ± 18.2 (p = 0.001). There was no need to take NSAIDs in 82.4% and 65.2% of patients (p = 0.103). No serious adverse reactions were noted. It was noted that the following factors had no effect on treatment: gender, BMI, baseline pain level, and the number of affected tendons.

Conclusion: The effectiveness of PRP and HA in chronic shoulder pain associated with subacromial impingement syndrome does not differ. The clinical response to both drugs was higher in people under 45 years of age.

P1272
EVALUATION OF EFFECTIVENESS OF HIGH MOLECULAR WEIGHT HYALURONIC ACID IN POST-TRAUMATIC OSTEOARTHRITIS OF THE KNEE JOINT

V. A. Nesterenko[1], B. E. Bialik[1], M. M. Makarov[1], K. A. Karateev[1], B. V. Bialik[1], S. V. Stadnik[1], M. S. Makarov[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Osteoarthritis (OA) is a serious social and economic burden for the world's population. The prevalence of OA in the world is constantly growing, which is associated with an increase in the number of obese people, joint injuries, and increased life expectancy. One of the means of helping patients with stage 3 knee joint OA is intra-articular injections of high-molecular hyaluronic acid. However, there is little data in the literature on the effectiveness of such drugs, depending on the frequency of administration. We aimed to evaluate the effectiveness of a single or double administration of a high molecular weight hyaluronic acid preparation with chondroitin sulfate in post-traumatic osteoarthritis of the knee joint.

Methods: The study involved 61 patients with post-traumatic osteoarthritis of the knee joint stage 3. All patients underwent intra-articular administration of high molecular weight hyaluronic acid with chondroitin sulfate, 36 patients received a single injection and 25 received a twofold injection with an interval of 7 d. To evaluate the results, the intensity of pain was determined using a visual analog scale and the total score on a numerical rating scale before the start of treatment, 1, 3, 6 and 12 months after a course of intraarticular injections of hyaluronic acid by telephone interview.

Results: In the whole group, pain during movement initially, after 2 weeks, 1, 3, 6, 12 months was 6,7 ± 3,1, 4,0 ± 3,2, 4,3 ± 3,1, 4,6 ± 2,8, 4,5 ± 2,5, 5,3 ± 1,4 see VAS. The pain at rest was 2,7 ± 3,1, 1,5 ± 2,6, 1,8 ± 2,6, 2,1 ± 2,6, 2,2 ± 1,8, 2,6 ± 1,3 see VAS. The function indicators were initially, after 2 weeks, 1, 3, 6, 12 months 4,9 ± 3,6, 3,5 ± 2,9, 4,2 ± 2,9, 4,0 ± 3,2, 3,5 ± 2,7, 4,3 ± 1,9 according to the numerical rating scale (NRS). In the first group, there are similar indicators: pain when moving 6,7 ± 3,1, 4,0 ± 3,2, 4,3 ± 3,1, 4,6 ± 2,8, 4,5 ± 2,5, 5,3 ± 1,4 See VAS alone 2,7 ± 3,1, 1,5 ± 2,6, 1,8 ± 2,6, 2,1 ± 2,6, 2,2 ± 1,8, 2,6 ± 1,3 See VAS, function 4,9 ± 3,6, 3,5 ± 2,9, 4,0 ± 2,9, 4,0 ± 3,2, 3,5 ± 2,7, 4,3 ± 1,9 according to the NRS. In the second group, pain during movement initially, after 2 weeks, 1, 3, 6, 12 months 5,6 ± 2,1, 3,3 ± 1,7, 3,6 ± 1,8, 3,4 ± 1,6, 3,7 ± 2,4,3,0 ± 1,2 See VAS, pain at rest 2,6 ± 2,4, 1,9 ± 1,7, 1,8 ± 1,6, 1,8 ± 1,7, 1,5 ± 2,2, 0,6 ± 1,0 See VAS, function 4,0 ± 3,1, 3,3 ± 2,6, 3,6 ± 2,7, 3,4 ± 2,6, 3,3 ± 3,1, 2,6 ± 1,7 according to the NRS.

Conclusion: The use of HA with chondroitin sulfate is an effective and safe means of therapy for posttraumatic OA knee joint. A two-time administration of HA with chondroitin sulfate at an interval of 7 days has a higher effectiveness in reducing pain and increasing function.

P1273
STATE OF BONE METABOLISM IN PATIENTS WITH CHRONIC PERIODONTITIS, DEPENDING ON THE FORM AND SEVERITY OF BRONCHIAL ASTHMA

O. Y. Poleshchuk[1], O. P. Galkina[1], V. B. Kaliberdenko[1], K. N. Kaladze[1], J. A. Dovbnya[1], E. R. Kuliyeva[1], K. K. Kaladze[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: All systemic diseases and their basic therapy, by changing the reactivity of the body, contribute to the occurrence and progression of periodontal tissue pathology. Inhaled glucocorticosteroids (GC), which are used in the treatment of bronchial asthma (BA), can cause systemic side effects like of bone metabolism. One of these effects of hormone therapy is a disorder of mineral metabolism. The consequence of long–term therapy is GC-induced osteoporosis. The objective method of bone tissue (BT) research is an ultrasonic densitometry. The indicators determined by this method give an idea of

both the BT state of the supporting skeleton and the maxillofacial region.

Methods: The study included 43 adolescents (14–16 years old) with a diagnosis of generalized periodontitis of mild severity, chronic course, suffering from BA. The treatment of generalized periodontitis (GP) was according to the protocol. The study was carried out by ultrasound osteodensitometry on the "Achilles + " with the determination of the density index (IP,%) of BT, wide-field attenuation of ultrasound (dB/MHz), of ultrasound propagation speed (UPS, m/s). The control group (CG) consisted of 20 somatically healthy adolescents of comparable age.

Results: The analysis of ultrasound parameters in adolescents with GP and persistent form of BA revealed a significant decrease in the values of density index (DI) BT 64.31 ± 1.41% ($p < 0.001$) and 98.05 ± 1.35 dB/Mhz ($p < 0.05$), UPS 1537.46 ± 2.29 m/s ($p < 0.05$). With mild BA degree indicators were unreliably lower than in CG—78.34 = 1.14%, 99.77 = 1.69 dB/MHz, 1543.29 = 2.61 m/s. In CG—87.26 ± 1.23%, 103.21 ± 2.71 dB/MHz, 1567.14 ± 2.49 m/s.

Conclusion: The phenomena of osteopenia are more pronounced in patients with moderate severity of asthma. Thus, therapeutic and preventive measures should be approached in a differentiated manner.

P1274
CORRECTION OF STRUCTURAL AND FUNCTIONAL PROPERTIES OF BONE TISSUE IN ADOLESCENTS WITH CHRONIC PERIODONTITIS ON THE BACKGROUND OF BRONCHIAL ASTHMA

O. Y. Poleshchuk[1], O. P. Galkina[1], V. B. Kaliberdenko[1], K. N. Kaladze[1], J. A. Dovbnya[1], E. R. Kuliyeva[1], K. K. Kaladze[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: The problem of osteopenic syndrome in children has long been of interest to scientists. The risk group for osteoporosis includes patients suffering from bronchial asthma (BA). Hypoxia, chronic inflammatory process, respiratory acidosis and long-term used of glucocorticosteroids adversely affect the condition of the child's bone tissue (BT). These changes are reflected in the maxillofacial region, including in the alveolar processes of the jaws. Normalization of the bone metabolism processes in children with BA is the prevention of the progression of generalized periodontitis.

Methods: The study included 38 adolescents (14–16 years old) with a diagnosis of generalized periodontitis of mild severity, chronic course, suffering from BA. The patients were divided into 2 groups. The first group (G-1) consisted of 20 people, the second group (G-2) – 18 people. Patients in G-1 and G-2 received standard therapy (hypoallergenic balanced nutrition, active climatotherapy, hydrotherapy and balneotherapy, heliotherapy, physical therapy, massage, mud applications provided for by BA protocols). In G-2, in order to correct osteopenic syndrome, patients received the drug Calcemin (Sagmel, Inc. USA) 250 mg 1 tablet 2 times a day for 21 d. The control group (CG) consisted of 20 practically healthy peers.

Results: According to ultrasound osteodensitometry, before the therapy, 32 (82.1%) patients had a decrease in the density index (DI) BT from -1 to -2.5 SD, which indicated manifestations of osteopenia, and in 2 (5.2%) patients it was < -2.5 SD, which corresponded to osteoporosis. In G-1, after the end of therapy, the DI BT indicator did not significantly change. It was noted before treatment at the level of 80.03 ± 1.27%, after treatment – 81.0 ± 1.72% (p0.05). In G-2, a significant increase in the DI of BT was recorded from 82.32 ± 1.64% to 85.96 ± 1.23% (p0.05).

Conclusion: The presence of adolescents with BA suffering from generalized periodontitis in conditions of therapy contributes to the positive dynamics of changes in bone metabolism. The inclusion of the drug "Calcemin" in the therapeutic and prophylactic scheme of generalized periodontitis against the background of BA leads to an improvement in the ultrasound characteristics of BT.

P1275
CHANGES IN MINERAL BONE DENSITY IN PATIENTS WITH PRIMARY COXARTHROSIS AND OBESITY

N. O. Miagkaia[1], J. S. Saenko[1], N. V. Saenko[1], V. B. Kaliberdenko[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: In most developed countries, obesity is becoming an "epidemic," which is a decisive factor in the development of osteoarthritis. As a result of excessive body weight, there is a change in the level of mineral bone density. However, existing data on the relationship between BMI and densitometric indicators of mineral bone density in patients with osteoarthritis of large joints are contradictory.

Methods: Analysis of mineral bone density and calculation of BMI was performed in 248 patients with varying degrees of primary coxarthrosis, aged 45 to 87 years, mean age—62.6 ± 8.2. Patients underwent BMI calculation using the standard formula and DXA of the lumbar spine and proximal femur with assessment by T-score. Based on the BMI values, patients were divided into 3 groups: normal weight (18.5–24.9), overweight (25–29.9), and obesity (30–50.7).

Results: The frequency of decreased mineral bone density was 84.6%—210 people (osteoporosis 44.2%—93 individuals, osteopenia 55.8%—117 individuals). There were no significant rank differences in mineral bone density and BMI in all three groups ($p = 0.36$). Evaluation of mineral bone density values in the lumbar spine showed no significant differences between all three groups ($p = 0.42$). No significant differences in mineral bone density values of the proximal femur were found depending on BMI ($p = 0.96$).

Conclusion: The obtained data indicate the absence of a direct correlation between mineral bone density and BMI in patients with primary coxarthrosis.

P1276
RISK FACTORS FOR DEVELOPMENT OF OSTEOPOROSIS IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

Y. O. Popenko[1], T. V. Shaldybin[2], V. B. Kaliberdenko[1], E. R. Kulieva[1], L. O. Ametova[1]

[1] V.I. Vernadsky Crimean Federal Univ., [2]Medaira Clinic, Simferopol, Russia

Objective: It is known that diabetes mellitus is one of the risk factors for the development of osteoporosis. However, in patients with type 2 diabetes mellitus (T2DM), BMD and FRAX® scores often do not fall outside the normal range. Therefore, it is important to determine additional factors that determine the risk of developing osteoporosis in this category of patients.

Methods: According to retrospective analysis of 152 medical records of patients with T2DM aged from 40–70 y. Also BMI, concomitant diseases, as cases of fractures were assessed, and densitometry was performed to assess BMD. In all patients, the blood level of 25(OH)D was examined (Architect test system), the HbA1c level was determined by ion exchange chromatography. Statistical analysis was carried out using the Statistica 10.0 software package.

Results: The study found that 13 (8.5%) patients with T2DM had a normal BMI, and 139 (91.5%) had overweight or obesity. The duration of the disease ranged from 1.5–25 y ((Me) 10 [8; 21]). HbA1c level—(Me) 8.8 [8;12.4]%, when analyzing the level of 25(OH)D in the blood serum, it was found that 30 (20%) patients had

a normal level of the indicator, but in 122 (80%) patients with T2DM, this indicator corresponded to insufficiency or deficiency. From the anamnesis it is known that 15 patients (10%) had fractures in adulthood. Low BMD was diagnosed in 42 (30%) women with T2DM.
Conclusion: The patients with T2DM in most cases have vitamin D deficiency and normal BMD, according to densitometry. In patients with type 2 diabetes, factors such as age and a decrease in BMI increase the risk of developing fractures and developing osteoporosis.

P1277
CORAL-DERIVED CALCIUM SUPPLEMENT IN COMBINATION WITH IBANDRONATE IMPROVES BONE MINERAL DENSITY OF THE DISTAL RADIUS

V. Babalyan[1], N. Hutchings[2], M. Qefoyan[1], S. Baghdasaryan[1], S. Kara-Poghosyan[1], J. P. Bilezikian[3]

[1]Osteoporosis Center of Armenia, Yerevan, Armenia, [2]Univ. of California, Los Angeles, Los Angeles, USA, [3]Columbia Univ., New York, USA

Objective: Osteoporosis and fragility fractures are major causes of morbidity and mortality in older individuals, but can be prevented if diagnosed and treated appropriately, including supplementation with calcium and vitamin D to maintain appropriate calcium intake and reduce bone resorption. Coral-derived calcium complex is a novel formulation of calcium supplement whose effect on skeletal health has not been rigorously studied.
Methods: We conducted a 3-arm randomized clinical trial of the effect on BMD in untreated osteoporotic women as follows: A) supplementation with coral-derived calcium + vitamin D complex 900 mg + 1200 IU daily with ibandronate 150 mg monthly; o B) ibandronate 150 mg monthly and vitamin D 1200 IU daily; C) coral calcium + vitamin D complex 900 mg + 1200 IU daily alone. We tracked changes in BMD of the lumbar spine, femoral neck, and distal $^1/_3$ radius over one year. Participants were instructed to abstain from calcium- or vitamin D-containing supplements and from other medications designed to treat osteoporosis not provided by the study.
Results: We recruited 60 women with osteoporosis as determined by T-score < -2.5. There were no significant differences in baseline BMD for the three skeletal sites among the three groups. Study agents were well-tolerated; only 3 individuals withdrew. Group A demonstrated a statistically significant improvement in distal radius BMD from baseline. Mean lumbar spine and femoral neck BMD improved but not significantly so.. Group B demonstrated a statistically significant improvement in lumbar spine BMD from baseline. Trends for improvement in distal radius and femoral neck did not achieving significance. Group C did not experience statistically significant improvement in any of the three skeletal sites..
Conclusion: Coral-derived calcium is well-tolerated and with ibandronate improves BMD of the distal radius. The known efficacy of ibandronate in improving BMD of the lumbar spine was again demonstrated in this study.
Disclosures:
This study was funded in part by an unrestricted grant from Coral Calcium LLC, manufacturer of the coral-derived calcium supplement under investigation. Ibandronate was provided as an in-kind contribution from Innovapharm LLC.

P1278
INFLUENCE OF OBESITY ON LIPOPOLYSACHARIDE-BINDING PROTEIN INDICATORS IN WOMEN WITH POSTMENOPAUSAL OSTEOPOROSIS

V. Beloglazov[1], Y. Usachenko[1], V. Kaliberdenko[1], E. Kulieva[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: Over the past decades, obesity and osteoporosis have become major global health problems as their prevalence increases. Low-grade systemic inflammation likely has negative effects on bone tissue, and increased adipogenesis in the bone marrow may lead to decreased bone mass in obese individuals. Postmenopausal osteoporosis is a common metabolic bone disease, and imbalance of the gut microbiota plays an important role in the development of this disease. Lipopolysaccharide (LPS), a component of gram-negative bacteria found in the intestines, can be released into the circulation and stimulate the immune system, increasing bone resorption. Excessive bone resorption plays a central role in the development of inflammatory diseases of the skeletal system, including osteoporosis. Thus, identifying agents that can effectively inhibit excess osteoclast formation and function is critical for the prevention and treatment of inflammatory bone loss. However, the effect of LPS on metabolic bone diseases is unknown.
Methods: 96 female patients diagnosed with postmenopausal osteoporosis were examined. All patients were divided into two clinical groups: group 1 – 42 women with postmenopausal osteoporosis and grade 1–2 obesity, average age 57.2 ± 1.8 y; Group 2 – 54 women with postmenopausal osteoporosis and normal BMI (without obesity), average age 55.7 ± 2.4 y. The comparison group consisted of 39 women comparable in age and gender, average age 56.4 ± 1.4 y. The level of lipopolysaccharide binding protein (LPB) in blood serum was determined by a quantitative highly sensitive enzyme immunoassay using the Hbt Human LPB ELISA kit, the results were expressed in μg/ml. Statistical processing of the results was carried out using statistical programs Microsoft Excel, Statistica 13.0 (StatSoft Inc.)
Results: In the first group of women with postmenopausal osteoporosis and obesity, the level of LPB in the blood serum was statistically significantly higher ($p < 0.001$), compared to the second group of women with normal BMI and the control group.
Conclusion: A relationship was found between postmenopausal osteoporosis, systemic inflammation and lipopolysaccharide binding protein (LPB) levels in patients with a combination of postmenopausal osteoporosis and obesity.

P1279
CLINICAL CASE: RESULTS OF ARTHROSCOPIC MOSAIC CHONDROPLASTY WITH SIMULTANEOUS CLOSE WEDGE MEDIAL HIGH TIBIAL OSTEOTOMY IN THE TREATMENT OF LATERAL POSTTRAUMATIC OSTEOARTHRITIS OF THE KNEE

V. Bialik[1], M. Makarov[1], S. Arkhipov[1], E. Bialik[1], A. Karateev[1], A. Gorelova[1], S. Maglevany[1], E. Naryshkin[1], A. Khramov[1], V. Nesterenko[1], A. Chernikova[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Arthroscopic mosaic chondroplasty (AMC) and closing wedge medial high tibial osteotomy (CWM HTO) are joint-saving surgeries that are most often used alone to treat osteoarthritis (OA) of the knee. We present a clinical case of simultaneous performance of these two operations in a professional athlete.
Case report: Patient Zh, 25 years old, with pain in the left knee joint that arose after falling on his leg while jogging in 2019. A lateral meniscus tear was diagnosed and arthroscopic partial resection was performed, which did not lead to improvement. He continued to be treated with non-steroidal anti-inflammatory drugs, glucosamine sulfate (GS), and intra-articular injections (IAI) of hyaluronic acid preparations. In 2022, due to persistent pain (70 mm on the visual analogue scale (VAS)) and a decrease in sports activity, he turned to

us for advice. Clinically, the patient had valgus deformity of the knee, increasing in the standing position, pain in the lateral part of the knee, and slight lateral instability. According to X-ray data, signs of stage 2 knee OA with predominant damage to the lateral compartment and valgus deformity of the knee joint of 14 degrees were identified. MRI diagnosed a chondral defect of the lateral femoral condyle measuring 1.5 × 2 cm. Taking into account the simultaneous presence of a chondral defect according to MRI data and valgus deformity of the knee, we decided on a one-stage restoration of the cartilage of the lateral femoral condyle through AMC and correction of the mechanical axis of the lower limb (reducing the load on the lateral part of the knee) using a rare operation – CWM HTO. Osteochondral columns for AMC were taken from non-weight-bearing sections in the arch of the femur with their subsequent transplantation into the defect area. A CWM HTO was performed using a standard mini-approach, a bone wedge was removed from the medial part of the proximal epiphysis of the tibia, after which the proximal and distal fragments of the tibia were closed and the achieved correction was secured with an original fixator. Rehabilitation after surgery included wearing an orthosis and unloading the leg by walking with additional support on a crutch for 8 weeks, taking a course of glucosamine sulfate and IAI of platelet-rich plasma during the transition to walking with full support on the operated leg. The patient returned to sports 6 months after surgery. At the follow-up examination 1 year after the operation, the patient was not bothered by pain (VAS 0 mm), the function of the knee was completely restored, the patient actively participates in competitions.

Conclusion: The combination of joint-saving surgery and conservative treatment of OA allowed a young patient with OA to get rid of pain, restore the function of the knee and return to sports.

P1280
MULTIFOCAL AVASCULAR OSTEONECROSIS AFTER COVID-19: A CLINICAL CASE: 2 YEARS FOLLOW-UP

V. Bialik[1], A. Karateev[1], E. Bialik[1], M. Makarov[1], S. Makarov[1], V. Nesterenko[1], A. Chernikova[1], A. Gorelova[1]

[1] V. A. Nasonova Research Institute of Rheumatology, Moscow, Russia

SAR-CoV-2 (COVID-19) infection can cause endothelial dysfunction, vasculitis, and thromboembolic complications. One of the manifestations of vascular pathology in this disease is avascular osteonecrosis (AON) of bones.

Case report: A 30-year-old patient, who didn't suffer from musculoskeletal diseases and didn't have thrombosis, suffered moderate COVID-19 in February 2021, which required hospitalization. Therapy was carried out with antibiotics, glucocorticoids (up to 30 mg/d for 3 weeks), antiviral drugs, anticoagulants. She was discharged from the hospital after cessation of fever, saturation normalization, and a negative SAR-CoV-2 (PCR) test. The patient noted the appearance of pain in both hip, left ankle and right shoulder joints by mid-December 2021. On examination: pain and limitation of movement in both hip joints, the severity of pain according to the visual analog scale (VAS, 100 mm)—75 mm on the left, 60 mm on the right, pain in the left ankle joint (VAS 50 mm), on the right shoulder (VAS 40 mm). On MRI of December 2021: osteonecrosis femoral head (ONFH), osteonecrosis humeral head (ONHH) and talar osteonecrosis (TON) stage 2 by Ficat-Arlet. The patient received therapy with alendronic acid (70 mg/week), calcium 1000 mg/day, alfacalcidol and dipyridamole (75 mg/d for 3 months), unloading both legs by walking with additional support on crutches, 9 sessions nuclear magnetic resonance therapy and taking NSAIDs as needed from December 2021 to September 2022. During examination, the patient was diagnosed with homozygous methylenetetrafolatereductase (MTFFR) gene (thrombophilia), and therefore lifelong therapy with rivaroxaban at a dose of 10 mg/d was prescribed. An MRI scan from September 2022 revealed progression of ONFH from stage 2 to stage 4 in both hips, stage 3 ONHH, stage 2 TON, osteonecrosis condyles of the humerus 2 stage, extensive bone marrow infarcts of the femur and tibia, ending in the subchondral region, were also identified. In the period from October 2022 to October 2023, due to the progression of osteonecrosis to terminal stages, the patient underwent total hip arthroplasty of both hip joints and anatomical arthroplasty of left shoulder joint with a good functional result to date. The patient continues to experience pain in the right shoulder joint, ankle and left knee joint. The patient is currently awaiting replacement of the right shoulder joint. The dynamic monitoring of the patient continues.

Conclusion: This case demonstrates the aggressive and rapid development and progression of AON after COVID-19 against the background of an existing thrombophilic predisposition and the need for endoprosthetics of at least 4 joints in a young patient.

P1281
INFLUENCE OF TARTRAZINE ON HISTOLOGICAL STRUCTURE OF THE MANDIBULAR CONDYLAR CARTILAGE

V. Bibik[1], V. Luzin[1], N. Mosyagina[1], O. Churilin[1], E. Krivosheev[1]

[1]FSBEI HI, St. Luka LSMU of MOH of Russia, Lugansk, Russia

Objective: To test influence of tartrazine after 60-d application on histological structure of the mandibular condylar cartilage (MCC) and administration of mexidol.

Methods: The study involved 105 male rats with body weight of 200–210 g. The first group comprised the intact animals (C-group), the second group comprised the animals that received *per os* tartrazine in dosage of 1500 mg/kg of body weight for 60 d (T-group), and the third group received intraperitoneal mexidol together with tartrazine in dosage of 50 mg/kg (TM-group). Upon expiration of observation terms, HE stained frontal sections of mandibular condyles were put to morphometry.

Results: In animals of the T-group in readaptation period from 3rd to the 45th day, total width of the MCC was less than the values of the C-group by 9.11%, 8.86%, 7.37%, 5.79%, and 3.75%; width of the proliferation zone decreased by 10.82%, 10.41%, 7.67%, 4.80%, and 4.04% and width of the zone of subchondral osteogenesis – by 11.26%, 11.05%, 10.42% 8.42%, and 5.78% and osteoblasts number in zone of subchondral osteogenesis decreased by 10.46%, 10.47%, 9.01%, 7.17%, and 4.96%. In animals of the TM-group from 3rd to 45th day of readaptation, the total width of the MCC exceeded the values of the T-group by 3.00%, 3.15%, 2.54%, and 2.67%, width of the proliferation zone on the 3rd day – by 3.92%, width of the subchondral osteogenesis zone from 15–45 d – by 4.35%, 4.43%, and 4.35% and osteoblasts number in it – by the 3rd day of readaptation increased by 5.95%.

Conclusion: Intragastric administration of tartrazine in dosage of 1500 mg/kg/d for 60 d was accompanied by inhibition of the morpho-functional activity of the MCC, which is maximally expressed on day 3 after tartrazine discontinue and then gradually recovers. Administration of mexidol in dosage of 50 mg/kg of body weight had a positive effect on the recovery of MCC compared with T-group.

P1282
LIFETIME RISK OF FRACTURE AMONG POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS AND AT HIGH RISK OF FRACTURE

V. C. Brunetti[1], H.-C. Chien[2], M. Mcdermott[2], T.-C. Lin[2], M. Kim[2]

[1]Amgen Ltd., London, UK, [2]Amgen Inc., Thousand Oaks, USA

Objectives Data from countries in the European Union (EU) show that the lifetime risk of fracture ranges between 43–78% [1, 2], but recent data from the USA (US) is lacking. The aim of this study was to assess the cumulative lifetime risk of fractures among postmenopausal women with osteoporosis aged ≥ 50 y of age in the US.
Methods: We followed a retrospective cohort of high-risk postmenopausal women with osteoporosis, aged ≥ 50 y using Optum Clinformatics® Data Mart, covering individuals who were privately insured or possessed employer-sponsored Medicare Advantage plans, from Jan 1, 2021 (index date) until the earliest of: 1) osteoporotic fracture, 2) death, 3) disenrollment, or 4) end of the study period (Dec 31, 2021) to assess the 1-y incidence of osteoporotic fractures after index date. High risk of fracture was defined as a history of fracture at any time prior to index date or by the presence of ≥ 2 risk factors among the following: a) age ≥ 65 y, b) history of smoking or alcohol use, d) type 2 diabetes mellitus, e) oral steroid use, f) rheumatoid arthritis, and g) immobilization. The following osteoporotic fractures were included: hip/femur, pelvis, lower leg and ankle, forearm, upper arm, and vertebral fractures, identified using ICD-10 and procedure codes. We used the current probability method [3], which uses the incidence of fractures by age strata, population estimates for each age and all-cause mortality incidence to estimate the lifetime risk of fracture [4].
Results: A total of 1,275,854 women were included in the study, with a mean (SD) age of 75.6 (8.9) y. The 1-y incidence of fractures increased by age, from 0.9% in women aged 50–54 to 9.7% in women aged ≥ 90 y. The lifetime risk of fracture among women with osteoporosis aged ≥ 50 and at high risk of fracture was 79.2%. This risk was 76.3% for women aged ≥ 55 years and 72.1% for women aged ≥ 60 y.
Conclusion: Among over one million, high-risk postmenopausal women with osteoporosis, more than 2 out of 3 will experience a fracture at least once in their remaining lifetime. This data highlights the importance of appropriate screening, diagnosis, and management of osteoporosis in this high-risk patient population.
References:

1. Lippuner K, etmy al., Osteoporos Int 2009;20:1131
2. von Friesendorff M. et al. J Bone Miner Res 2008;23:1832
3. Esteve J, et al. Statistical Methods in Cancer Research: Descriptive Epidemiology, in IARC Scientific Publications, I.A.f.R.o.C. (IARC), Editor. 1994, International Agency for Research on Cancer (IARC): Lyon, France.
4. Sanders S. Guide to calculating national life tables: Explanation of the methodology used to create the national life tables. 2019 [cited 2023 20 September 2023]; Available from: https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandlifeexpectancies/methodologies/guidetocalculatingnationallifetables#:~:text=%2D%20dx-,Calculating%20qx,-To%20calculate%20the.

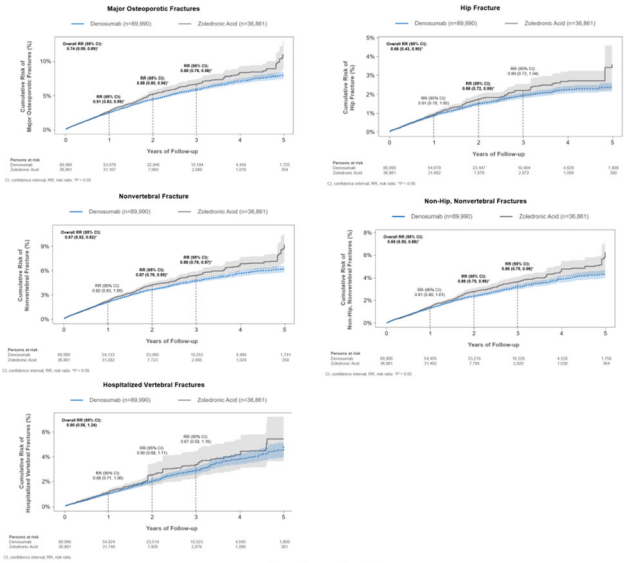
Acknowledgements: We thank Elizabeth Kang, Cici Liu, Michi He and Jessica Spencer for their programming support on this abstract.

P1283
COMPARATIVE EFFECTIVENESS OF DENOSUMAB VERSUS ZOLEDRONIC ACID AMONG POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS IN THE U.S. MEDICARE PROGRAM

J. R. Curtis[1], T. Arora[2], Y. Liu[1], T.-C. Lin[3], L. Spangler[3], V. C. Brunetti[4], R. K. Stad[3], M. Mcdermott[3], B. D. Bradbury[3], M. Kim[3]

[1]Univ. of Alabama at Birmingham, Birmingham, USA, [2]Foundation for Advancing Science, Technology, Education and Research, Birmingham, USA, [3]Amgen Inc., Thousand Oaks, USA, [4]Amgen Ltd., London, UK

Objective: Although clinical trials have shown that denosumab (Dmab) significantly increases BMD at key skeletal sites more than zoledronic acid (ZA), evidence from randomized trials evaluating fracture outcomes is lacking. This retrospective cohort study evaluated the comparative effectiveness of Dmab vs. ZA in reducing fracture risk among women with postmenopausal osteoporosis (PMO) in the U.S.
Methods: Female Medicare fee-for-service beneficiaries ≥ 66 y of age who newly initiated Dmab (n = 89,990) or ZA (n = 36,861) between Jan 1, 2012 to Dec 31, 2018 with no prior history of osteoporosis treatment were followed from treatment initiation (index date) until the first instance of a given fracture outcome, treatment discontinuation (defined as the end of exposure according to usual dosing intervals + 60-d gap) or switch, Medicare disenrollment, death, end of available data (Dec 31, 2019), or 5 y post-index date. A doubly robust inverse-probability of treatment (weights estimated from multivariate logistic regression models) and censoring (weights estimated from multivariate Cox Proportional Hazards regression models) weighted function was used to estimate the relative risk (RR) associated with the use of Dmab compared with ZA for major osteoporotic (MOP; nonvertebral and hospitalized vertebral), hip, nonvertebral (NV; includes hip, humerus, pelvis, radius/ulna, other femur), non-hip, nonvertebral (NHNV), and hospitalized vertebral (HV) fractures for the overall study period and by year of follow-up.
Results: Over a maximum of 5 y of follow-up, Dmab reduced the risk of MOP by 26% (RR = 0.74; 95%CI: 0.59–0.89), hip by 34% (0.66; 0.43–0.90), NV by 33% (0.67; 0.52–0.82), and NHNV by 31% (0.69; 0.50–0.88), and HV fractures by 10% (0.90; 0.56–1.24) compared with ZA (Figure). Over time, Dmab reduced the risk of MOP fractures by 9% (0.91; 0.83–0.99) at year 1, 12% (0.88; 0.80–0.96) at year 2, and 12% (0.88; 0.78–0.98) at year 3. An increase in the magnitude of fracture risk reduction with increasing duration of exposure was also observed for other NV outcomes.



Conclusion: In a cohort of over 125,000 treatment-naive women with PMO, we observed robust, clinically meaningful reductions in the risk of MOP, hip, NV, and NHNV fractures for patients on Dmab compared to ZA, with greater reductions in fracture risk with longer duration of exposure.

P1284
STRESS FRACTURE OF BASE OF FIFTH METATARSAL BONE IN A PATIENT WITH OSTEOPOROSIS AND ESSENTIAL THROMBOCYTHEMIA (ET)

V. Dimitrioski[1], D. Jovanovska—Jordanovski[1], S. Lazarevska[2], D. Grujoska -Veta[3], M. Jakimova[4]

[11]PHI Health Center Skopje, Polyclinic Jane Sandanski, R. N. Macedonia, Skopje, North Macedonia, [2]Center for Physical and Kinesitherapy- Laser Med, Skopje N. Macedonia, Skopje, North Macedonia, [32] PHI U. Clinic of Orthopaedic Diseases -Skopje, R. N. Macedonia, Skopje, North Macedonia, [4]Orto Plus Ped Private Orthopaedic Practice, Skopje N. Macedonia, Skopje, North Macedonia

Dimitrioski V.[1], Jovanovska—Jordanovski D.[1], Grujoska -Veta D. [2], Lazarevska S. [3], Jakimova M.[4]

[1] PHI Health Center Skopje, Polyclinic Jane Sandanski, R. N. Macedonia, [2] PHI U. Clinic of Orthopaedic Diseases -Skopje, R. N. Macedonia, [3] Center for Physical and Kinesitherapy- Laser Med, Skopje N. Macedonia, [4] Private Orthopaedic Practice Orto Plus Ped, Skopje N. Macedonia.

Stress fractures arise as a result of microscopic injuries sustained when bone is subjected to repeated submaximal stresses. Our patient has comorbidities that further the causality into an insufficiency reaction stress fracture, where bone formation is impaired, in our case because of osteoporosis. This is a case of a female patient with a history of osteoporosis, essential thrombocythemia (ET) and a late discovery fracture of base of the fifth metatarsal bone.

Case report: 73 years female, 153.0 cm height, weight 55 kg, menopause at 48 y, history of pain in the lateral side of her right midfoot for a period of 6 months. VAS score 7 at first consult, 7 d later pain decreased with oral analgesics. The patient is treated for ET with HYDREA for several years. This patient was treated with a bisphosphonate for several years and after a drug pause she was restarted on bisphosphonate monthly. She also had a L1 vertebral fracture diagnosed and treated 12 months ago. After a physical examination, labs, X-ray, DXA scan, and a CT scan of the right foot were done. Radiography showed a fracture of the zone 1/zone 2 base of fifth metatarsal bone in sanationem. CT scan of foot confirmed an old fracture with bone callus forming. DXA scan: T-score L spine -3.4; T-score l hip -2.4. Labs: ionized Ca 1.31/ total body Ca 2.44/ vit. D 32.47.

Conclusion: A diagnosis of stress fractures must be taken in consideration when they occur in the older population despite treatment for osteoporosis.

P1285
OSTEOPOROSIS AND OSTEOPENIA IN ANKYLOSING SPONDYLITIS: A STUDY IN QSUT, ALBANIA

E. Guci[1], V. Duraj[1], L. Djepaxhia[1], A. Gremi[1], E. Arizi[1], L. Prifti[1], G. Leka[1], L. Gjoni[1]

[1]Qendra Spitalore Universitare Nene Tereza, Tirana, Albania

Objective: Ankylosing spondylitis is an inflammatory condition affecting the spine, which may lead to complications such as osteoporosis and osteopenia. The aim of this study is to evaluate the risk of osteoporosis and osteopenia in patients with ankylosing spondylitis.

Methods: We evaluated 102 patients suffering from ankylosing spondylitis in our hospital consulting center. We performed a complete history and physical review of past medical records and radiographs, complete blood count, c-reactive protein, erythrocyte sedimentation rate, HLA-B27, chemistry profile, TSH, urinalysis, 25-OH vitamin D. Our main focus was evaluating the risk of osteoporosis or osteopenia in ankylosing spondylitis patients using the DXA. We recorded comorbidities for each patient such as diabetes, COPD, cardiac insufficiency, neurological disorders.

Results: There were 28 females aged 26–65 y (27.4%) and 74 males aged 18–74 y (72.6%) included in our study. It has been seen that among the female patients 2 showed a T-score $>$ -1, 16 showed a T-score of -1 to -2.5 suggesting osteopenia and 10 showed a T-score $<$ -2.5 suggesting osteoporosis. Among the male patients 54 showed a T-score $<$ -2.5, 15 showed a T- score -1 to -2.5 and 5 showed a T-score $>$ -1.

Conclusion: Patients diagnosed with ankylosing spondylitis have a huge risk of developing osteoporosis or osteopenia. It also shows that osteoporosis is more common among male patients. The standard for diagnosis of osteoporosis in ankylosing spondylitis is a DXA of the spine and hip. It is important to evaluate the results of the DXA to establish an adequate therapy which should include preventive measures, in addition to bisphosphonates and when possible, TNFα inhibitors.

P1286
VALIDATION OF THE NOTTINGHAM HIP FRACTURE SCORE (NHFS) AMONG ITALIAN ORTHOGERIATRIC PATIENTS: RESULTS FROM A MULTICENTRIC STUDY

V. Gemo[1], F. Perini[1], C. Properzi[1], M. Baroni[1], M. Ferracci[1], C. Ruggiero[1], V. Bini[2], P. Montanari[3]

[1]Geriatric Unit and Orthogeriatric Service Univ. of Perugia, Perugia, [2]Statistics Section Univ. of Perugia, Perugia, [3]Geriatric and Orthogeriatric Unit Dept. of Neuromotor and Rehabilitation of Reggio Emilia, Reggio Emilia, Italy

Objective: Hip fracture is associated to high short and long-term mortality and disability with high human and social cost. The patient's characteristics in the preoperative phase and factors related to surgical treatment have an impact on functional recovery and survival. Several tools have been developed to assess the mortality risk associated with surgery. Of these, NHFS appears to be one of the most reliable. The aim of our study is to validate the reliability of NHFS in a cohort of Italian patients with femoral fractures and identify variables potentially capable of updating the prediction model in our population.

Methods: A multicenter prospective study was conducted on orthogeriatric patients admitted for hip fracture from the Hospital of Perugia and Reggio Emilia. All patients undergoing surgical treatment, also those with periprosthetic and pathologic fractures, were included without age limit. Personal and clinical information was collected through computerized medical records. 30-d survival status was identified through regional mortality registries. Bivariate and multivariate logistic regression was performed to assess 30-d risk of death according to hip surgery and other clinical, functional, and biochemical variables. The predictive accuracy of NHFS and other logistic regression models was quantified as area (AUC) under ROC curves.

Results: Data collected from 1189 patients, mostly women, with NHFS variably represented from 0 to 9 were examined. The tool was validated and recalibrated for the study population with an AUC of 0.662, similar to that estimated by ASA. Logistic regression also provided a significant association with the risk of death at 30 d after surgery for functional variables (ADL, IADL, and METs) that were analyzed in different models, whereas albumin, vitamin D, and polypharmacy were not significant.

Conclusion: NHFS appears a fairly reliable tool for estimating 30-day mortality from surgery in Italian orthogeriatric patients, however it seems that this estimate can be improved by considering other variables, in particular METs. The most effective way to

combine NHFS and METs into a score with better predictive power may be a future challenge.

P1287
LOWER LIMB STRENGTH ASSOCIATION WITH INCREASED RISK OF FRAILTY AND FALLS IN OLDER ADULTS

J. Kilaitė[1], V. Ginevičienė[2], A. Mastavičiūtė[2], R. Dadelienė[2], I. E. Jamontaitė[2], V. Alekna[2], E. Pranckevičienė[2], I. I. Ahmetov[2]

[1]Clinic of Internal Diseases and Family Medicine, Institute of Clinical Medicine, Faculty of Medicine, Vilnius Univ., [2]Faculty of Medicine, Vilnius Univ., Vilnius, Lithuania

Objective: To compare lower limb strength in older people who had frailty and had fallen and without these conditions.
Methods: The study included 55 community dwelling older adults (mean age 77.98 ± 7.62 y). An inclusion criterion to this cross-sectional study were: age 65 or more years, unrestricted mobility, MMSE ≥ 21. Lower limb strength was evaluated by 5-time chair stand test. If participants took 15 or more seconds to perform the test they were classified as having lower limb weakness. Frailty status was defined using Fried's criteria: weakness, low walking speed, low physical activity, weight loss, exhaustion. Participants were classified as robust, prefrail and frail if they scored 0, 1–2, 3 points, respectively. History of falls was assessed by asking whether the subject had experienced falls in the past 12 months. Correlation between lower limb strength between people with and without frailty and falls was assessed by Kruskal–Wallis test. Multinomial logistic regression was used to assess the odds of having frailty and falls if lower limb strength decreases.
Results: Out of all participants 12 (21.42%) were men and 43 (78.58%) were women. Out of all participants 22 (39.3%) were classified as having lower limb weakness, of which 2 (9.09%) were men and 20 (90.91%) were women. According to frailty status 13 (23.2%) participants were evaluated as being robust, 25 (44.6%) having pre-frailty and 17 (30.4%) were frail. Falls were reported in 34 (62.5%) participants. Frailty and falls were found in 16 (28.6%) participants: 5 (31.25%) men and 11 (68.75%) women. Kruskal–Wallis test showed that there was a statistically significant difference in lower limb strength between the older people with and without frailty and falls ($\chi^2 = 10.72$, p = 0.013). Logistic regression revealed that even in adjusted analysis decreasing lower limb strength was associated with increased risk of having frailty and falls (OR: 1.27 (1.03–1.58)). No such association were found when comparing lower limb strength in only frailty or falls groups.
Conclusion: Reduced lower limb strength was associated with frailty and increased risk of falling.
Acknowledgement: Funding from the Research Council of Lithuania (LMTLT), agreement No S-MIP-22–36.

P1288
OSTEOPOROSIS RISK ASSESSMENT USING IOF AND FRAX QUESTIONNAIRES AND OTHER FACTORS

A. Zayaeva[1], I. Yatskov[1], A. Klimchuk[1], V. Beloglazov[1], V. Kaliberdenko[1], N. Shadchneva[1], D. Shaduro[1], E. Kulieva[1], S. Kulanthaivel[2]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Naarayani Multispeciality Hospital, Erode, India

Objective: Currently more than 50% of patients with osteoporosis in Russia do not receive adequate examination and treatment, which is due insufficient equipment of medical institutions, the lack of education of the population, an incorrect approach to therapy and perception of the picture of the disease and its consequences. In this regard, we have engaged in the study of additional factors reflecting the degree of risk of osteoporosis.
Methods: The collection of statistical data was carried out in the process of interviewing patients of the "Clinical Hospital named after N.A. Semashko". During the survey, 100 patients (63 ± 25 y) were asked to answer questions from the International Osteoporosis Foundation (IOF) and Fracture risk assessment tool (FRAX) questionnaires, as well as additional questions about their feeding preferences and drug treatment, which may affect the level of calcium in the body.
Results: All respondents were at risk by at least 1 criterion. 49 people answered positively about previous fracture anamnesis, which acts as a fact of accomplished pathological fractures. 25 respondents took glucocorticoids for more than 3 months, and 11 people suffered from rheumatoid arthritis. 23 women have a history of early menopause, with one in five women reporting menstrual cycle interruptions of more than 12 months and removal of appendages during their lifetime. Every fourth patient abuses coffee, and every third—food salt. In addition, it turned out that every second patient suffered from hypertension, which, according to recent studies, is also a risk factor for osteoporosis. 14 patients regularly received monotherapy with loop diuretics, which, according to the latest data, affects the level of calciuria.
Conclusion: The IOF questionnaire considers more patient history data in comparison with the FRAX questionnaire, however, the FRAX questionnaire also takes into account the level of bone condition—mineral density, which undoubtedly speaks, on the one hand, about the high accuracy of the data, and on the other, about the high cost of the study. It may be advisable to identify a large risk group using an IOF survey, and then offer an IPC study and, consequently, a FRAX questionnaire.

P1289
QUESTIONNAIRE FOR THE STUDY OF CALCIURIA FACTORS IN THE PREVENTION OF OSTEOPOROSIS

A. Zayaeva[1], I. Yatskov[1], A. Klimchuk[1], V. Beloglazov[1], V. Kaliberdenko[1], N. Shadchneva[1], D. Shaduro[1], E. Dolya[1], E. Kulieva[1], S. Kulanthaivel[2]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Naarayani Multispeciality Hospital, Erode, India

Objective: There is a huge number of risk factors of osteoporosis development, among which there are modifiable: taking glucocorticoids or low weight and unmodified factors: gender, chronic diseases, age over 60 y. Modifiable factors require immediate correction and play a primary role in the system of both primary and secondary prevention of osteoporosis. It has been noted that calcium intake and physical activity at a young age can be important factors determining peak bone mass. However, this is not enough in modern therapy, for effective prevention and treatment, it is also necessary to reduce the excretion of calcium from the body, most of which is excreted in the urine.
Methods: The questionnaire form was created, in which the received data were entered in the form of a survey. This form was tested on 100 patients of various medical profiles who were being treated in "Clinical Hospital named after N.A. Semashko".
Results: Among the nutritional factors, coffee, caffeinated beverages and edible salt have a direct effect on calciuria. In addition, a regular high protein load and the consumption of foods containing protein of animal origin influence the increased level of calcium in the urine. Loop diuretics and aminoglycosides are distinguished among medications. At the same time, the use of loop diuretics together with

thiazide reduces calciuria. Of the additional anamnestic factors, the presence of arterial hypertension in the anamnesis and special working conditions (chemical production) are noted, which also affects the level of calcium excretion.

Conclusion: The developed questionnaire was successfully applied, as a result of which patients of an increased risk group for the development of osteoporosis were successfully identified. Out of 100 people, 37 were at risk due to increased salt intake, 29-abused coffee. A 14 patients who is regularly received monotherapy with loop diuretics, 6 people were treated with antibiotics from the aminoglycoside group. In total, an increased risk, namely more than one risk factor, of an increase in calciuria was observed in 79 subjects, which indicates the need to revise the recommendations for the prevention of osteoporosis and lifestyle modification.

P1290
CHRONIC INFLAMMATION AS A RISK FACTOR FOR OSTEOPOROSIS IN PATIENTS WITH CHRONIC KIDNEY DISEASE UNDERGOING HEMODIALYSIS

A. Klimchuk[1], A. Zayaeva[1], I. Yatskov[1], V. Kaliberdenko[1], A. Petrov[1], E. Kulieva[1], S. Kulanthaivel[2]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Naarayani Multispeciality Hospital, Erode, India.

Objective: Hemodialysis (HD) is the most common method of renal replacement therapy used in chronic kidney disease (CKD), and allows increasing the life expectancy of patients by 9–10 years. Anemia is one of the serious complications of end-stage CKD, which worsens the quality of life and survival of patients with HD and requires timely effective treatment.

Methods: The study included 14 patients with CKD undergoing hemodialysis at the "Clinical Hospital named after N.A. Semashko", complicated by anemia. The average age of patients was 47.41 ± 9.16 years old. The average duration of stay on hemodialysis was 67.1 ± 19.2 months. All patients received erythropoietin preparations at a dose of 6000 IU/week and iron preparations at a dose of 100 mg/week. The patients were divided into two groups. Group 1 included 7 people with a higher level of systemic inflammation in terms of C-reactive protein (CRP), group 2 – with less pronounced systemic inflammation. In all patients, the level of CRP and hemoglobin (Hb) was studied in 2 stages: before and 3 months after the start of the anemia treatment. The control group consisted of 14 relatively healthy people, comparable in gender and age, with normal CRP values (1.3 mg/l) and normal hemoglobin (Hb) levels.

Results: In group 1, the average value of CRP was 59.5 mg/l, in group 2—7.4 mg/l. In group 1, the Hb level before initiation of therapy was 78.4 g/l, and 3 months after the start of treatment increased by only 8.1% and amounted to 84.4 g/l ($p < 0.001$). The Hb level in group 2 before the start of treatment was 91.8 g/l, and after 3 months of therapy increased by 18.5% and amounted to 112.7 g/l ($p < 0.001$). The general correlation analysis revealed the presence of a negative linear relationship between the indicators of CRP and Hb ($r = -0.482$), at the significance level of $p = 0.027$.

Conclusion: The results of the study indicate a significant role of chronic systemic inflammation in the severity of anemia and the effectiveness of its therapy in patients with CKD on HD. It was found that in patients with lower CRP indices, the effectiveness of anemia treatment with iron and erythropoietin preparations is higher than among patients with its higher values ($p < 0.001$), which indicates the need to search for the causes and methods of correction of systemic chronic inflammation in patients with CKD on HD.

P1291
SECONDARY HYPERPARATHYROIDISM AND C-REACTIVE PROTEIN LEVELS AS RISK FACTORS FOR OSTEOPOROSIS IN PATIENTS WITH CHRONIC KIDNEY DISEASE UNDERGOING HEMODIALYSIS

A. Klimchuk[1], A. Zayaeva[1], I. Yatskov[1], V. Kaliberdenko[1], A. Petrov[1], E. Kulieva[1], S. Kulanthaivel[2]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Naarayani Multispeciality Hospital, Erode, India

Objective: In the last decade, there has been an increase in patients with chronic kidney disease (CKD) undergoing renal replacement therapy (RRT). The main method of RRT is currently hemodialysis (HD). Extracorporeal methods of blood purification increase the life expectancy of patients with end-stage CKD, but the quality of life of these patients remains reduced. One of the reasons for this is a violation of phosphorus-calcium metabolism and the frequent development of secondary hyperparathyroidism (HPT). Currently, it is known that PTH is a universal uremic toxin, which leads to many complications.

Methods: The study included 10 patients with stage 5 CKD who have been on HD at the "N.A. Semashko Republican Clinical Hospital". The average age of patients was 45.62 ± 4.15 years old, the average duration of stay on hemodialysis was 54.1 ± 16.4 months. PTH and CRP levels were studied in all patients. The control group consisted of 10 relatively healthy people with normal values of CRP and PTH.

Results: The studied patients were divided into two groups according to the level of PTH. Group 1 included 5 patients with normal PTH levels (33.77 ± 8.35). Group 2 included 5 patients with elevated PTH (535.6 ± 289). When studying CRP, it was noted that in all patients participating in the study, this indicator exceeds the norm. Among group 1 patients, CRP was 8075 ± 1082, which is 4.8 times higher than normal ($p < 0.001$). In patients of group 2, CRP corresponded to 66.88 ± 11.29, which is 38 times higher than the indicators of healthy donors ($p < 0.001$). It was noted that in patients of group 2, the level of CRP was significantly higher ($p = 0.014$) than the level of this indicator in patients of group 1 and was positively correlated with the level of PTH ($r = 0.995$), at the significance level $p = 0.005$). There was no correlation between CRP and PTH in group 1 patients.

Conclusion: In patients with stage 5 CKD on HD with the development of GPT, an increase in PTH levels may contribute to the development of systemic inflammation common in this category of patients.

P1292
TUMOR NECROSIS FACTOR A RECEPTORS: A THERAPEUTIC TARGET IN THE TREATMENT OF AUTOIMMUNE DISEASES

A. Zayaeva[1], I. Yatskov[1], V. Kaliberdenko[1], E. Dolya[1], G. Koshukova[1], A. Klimchuk[1], V. Beloglazov[1], S. Kulanthaivel[2], E. Kulieva[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Naarayani Multispeciality Hospital, Erode, India

Objective: Autoimmune rheumatic diseases are a group of diseases characterized by a self-sustaining, autoreactive adaptive immune response resulting in immune-mediated damage to target organs. It has been established that TNFα plays an important role in the development of inflammation as a pathological component of autoimmune diseases. Understanding of the mechanism of TNFα signaling has been expanded and applied to the treatment of autoimmune diseases, leading to the development of effective therapeutic agents, including TNFα inhibitors.

Methods: Using the NCBI PubMed search engine, 19 articles were selected that evaluated the efficacy, safety, and immunogenicity of TNFα receptor inhibitors.
Results: One of the new therapeutic approaches in the treatment of autoimmune diseases is the selective inactivation of TNFα receptors. Drugs whose mechanism is to block TNFα receptors are undergoing clinical trials. Atrosab, atrosimab, TNF-1 receptor silencer (TROS), R1antTNF, XPro1595 selectively block the TNFα type 1 receptor. In clinical studies, administration of atrosab to CIA rhesus monkeys resulted in a decrease in serum acute phase C-reactive protein (CRP) and IL-6 levels, prevented weight loss, delayed the onset of arthritis symptoms, and improved the clinical assessment of arthritis. A selective nanobody-based inhibitor of TNFR1 TROS reduced the secretion of IL-6, IL-8, and TNF in ex vivo cultured inflammatory colon biopsies from patients with active Crohn's disease. Due to the fact that activation of the type 2 receptor to TNFα leads to a cascade of anti-inflammatory reactions, it is advisable to use agonist drugs. One such drug is EHD2-sc-mTNFR2. In studies conducted in mice treated with a TNFR2 agonist, arthritis improved only after more than a 10-d follow-up period.
Conclusion: To date, a sufficient number of biosimilars of reference TNFα inhibitors have been created. New drugs, such as TNF receptor inhibitors, could be a breakthrough in the treatment of autoimmune diseases. Therefore, it can be assumed that much more attention will be paid to the understanding of TNFα signaling in the near future in order to develop effective tools for the treatment of other autoimmune diseases, as well as a wide range of diseases associated with TNF.

P1293
INPATIENT FALL RISK ASSESSMENT AND AVAILABLE INTERVENTIONS TO REDUCE IT

A. Zayaeva[1], N. Shadchneva[1], I. Yatskov[1], V. Kaliberdenko[1], E. Dolya[1], G. Koshukova[1], A. Klimchuk[1], E. Kulieva[1], S. Kulanthaivel[2]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Naarayani Multispeciality Hospital, Erode, India

Objective: Patient falls in healthcare organizations have become a particularly pressing problem for healthcare systems worldwide. In addition to causing serious damage to their health, the resulting injuries lead to an increase in the duration and cost of treatment. The most significant components of a program aimed at improving patient safety in a hospital are: initial assessment of the risk of falls with the identification of individual risk factors, identification of risk zones, education of patients and their family members on fall prevention, training of medical staff, registration and analysis of all cases of falls.
Methods: 76 patients of therapeutic, pulmonologic, and neurologic departments aged 75–95 y (mean age 78.2 ± 3.3 y). All patients were risk assessed using the Morse Fall Scale, baseline and instrumental activity indices, nutritional risk, and tests to detect cognitive decline were calculated.
Results: Senile asthenia of varying severity was detected in 35% of patients, preasthenia in 29%, and 41% of patients were found to be in satisfactory condition. According to the Morse scale, all patients with asthenia and preasthenia had a risk of falls of 55 points or higher. Hearing and vision disorders were found in 90% of the patients studied, gait disturbance in 68%, balance disturbance, dizziness, and frequent urination in 48%. 30% of patients received drug therapy that aggravated the risk of falls (diuretics, tranquilizers, sedatives, sleeping pills, analgesics).
Conclusion: Morse Fall Scale assessment of the risk of falls in elderly patients is a simple and informative tool for predicting the risk of falls in hospital and a starting point for planning measures to reduce this risk. We consider it necessary to focus the attention of medical staff on the principles of safe behavior and to strengthen the control by the doctor and hospital administration on compliance with preventive measures.

P1294
A CLINICAL CASE OF MANIFESTATION OF COXARTHROSIS IN A PATIENT AFTER A NEW CORONAVIRUS INFECTION

A. Zayaeva[1], N. Shadchneva[1], I. Yatskov[1], V. Kaliberdenko[1], E. Dolya[1], G. Koshukova[1], A. Klimchuk[1], E. Kulieva[1], S. Kulanthaivel[2]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Naarayani Multispeciality Hospital, Erode, India

Objective: The 2019 coronavirus disease (COVID-19) pandemic continues to impact the global community, and as understanding of its pathophysiology increases, so does interest in the various effects of the SARS-CoV-2 coronavirus that causes it. Studies in patients who have survived COVID-19 have shown significant adverse musculoskeletal effects. The negative effects of SARS-CoV-2 are due to direct (develops after contact of the virus with cells that have receptors) and indirect effects (systemic inflammation) on humans.
Methods: We analyzed anamnestic, clinical, laboratory and instrumental data of a clinical case of coxarthrosis development after COVID-19 infection in a 40-year-old man. Information from the medical history was provided by the Crimean Republic "Sudak Hospital".
Results: A 40-year-old man consulted a rheumatologist with complaints of severe pain in the joints of the hands and elbow joints of the hands of both hands, which restrained movements and impaired the quality of life. The pain lasted for about three months; the patient attributed it to a change in his diet. Five months before the above-mentioned complaints, the patient had COVID-19, in a mild form without complications. He consulted a rheumatologist and was diagnosed with reactive arthritis and then osteoarthritis of the sacroiliac joints. At the time of examination in neutrophils—82%, in biochemical analysis – elevated total cholesterol (7.94 mmol/L), elevated CRP (5.97 mg/L). Antibodies to cyclic citrulline-containing peptide (-), rheumatoid factor (-), prostate specific antigen (-). Neutralizing IgG antibodies to COVID-19 S-protein were 257 BAU/ml. The patient was referred to a pulmonologist for consultation. On referral to pulmonologist, Long-COVID-19 was diagnosed based on laboratory findings and CT scan of the lungs. X-ray showed deforming coxarthrosis. MRI – MR signs of osteoarthritis of the sacroiliac joints.
Conclusion: The current study showed that COVID-19 can possibly fulfill a destructive role in chronic diseases, particularly in coxarthrosis, and negatively affect the course of the disease. Under these circumstances, the recording and surveillance of people with new coronavirus infection and the implementation of qualified treatment and prophylaxis are of great practical importance.

P1295
OSTEOPOROSIS IN THE PRACTICE OF A DENTIST

G. Koshukova[1], A. Zayaeva[1], V. Beloglazov[1], I. Yatskov[1], V. Kaliberdenko[1], E. Dolya[1], E. Kulieva[1], S. Kulanthaivel[2]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Naarayani Multispeciality Hospital, Erode, India

Objective: The most common manifestations of osteoporosis (OP) are vertebral compression fractures, fractures of the distal forearm, proximal femur, and proximal humerus. Today, OP is considered in the focus of interest of primary care physicians, where the main flow of potential patients is concentrated. In addition to changes in bone

microarchitectonics, bone deformation and pathologic fractures may occur. The symptomatology is very similar to periodontal disease, which may be present in parallel, but without adequate treatment, the result will be doubtful. It is therefore important to be examined by a dentist who will prescribe the appropriate examination, consultations with allied specialists.

Methods: Current information from the literature on the need to treat osteoporosis in the practice of the dentist was analyzed.

Results: There are no characteristic symptoms, including early symptoms. The following signs may be suspected: increased sensitivity of tooth enamel, severe exposure of tooth roots resulting in large gingival pockets, increased tooth mobility, pronounced loosening, excessive plaque formation. The most common causes of localized OP are diseases accompanied by local inflammation of the jaw OP are diseases accompanied by local inflammation of the jaw: osteomyelitis, periodontitis, periodontal disease, tumors – cysts or granulomas. The assessment of the degree of OP and jaw atrophy is very is very important from a prognostic point of view when planning prosthetics. Taking into account all concomitant conditions will make it possible to perform the most effective prosthetics, taking into account the preoperative indications for dental implantation. In people who wear dentures, the destructive processes in the oral cavity will occur faster because these structures are fixed directly on the bare tooth. It is important to be examined by specialists and to start treatment and further prevention of osteoporosis.

Conclusion: OP should be considered as a multidisciplinary problem that requires close attention from physicians of all specialties in order to carry out early prevention, diagnosis, timely treatment and prevention of complications.

P1296
APPLICATION OF BETAMETHASONE BY ELECTROFORESIS TO AVOID OSTEOPOROSIS DEVELOPMENT

G. Koshukova[1], A. Zayaeva[1], V. Beloglazov[1], I. Yatskov[1], V. Kaliberdenko[1], E. Kulieva[1], S. Kulanthaivel[2], E. Dolya[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Naarayani Multispeciality Hospital, Erode, India

Objective: The problem of treatment of patients with rheumatoid arthritis (RA) remains relevant to date due to the progressive nature of the disease and high level of disability. There is still a need to search for additional methods of RA therapy that can enhance the anti-inflammatory effect of the current therapy without causing adverse events, including osteoporosis and contributing to the prolongation of remission of the disease.

Methods: We examined and treated 10 patients with a verified diagnosis of RA 1–2° of activity, receiving the same baseline therapy. Betamethasone electrophoresis was applied as an additional therapeutic factor using a local technique. The control group consisted of RA patients, comparable in sex, age, and RA activity, who were not treated with physical factors.

Results: Inclusion of betamethasone electrophoresis in the treatment complex resulted in statistically significant reduction of arthralgic syndrome and disease activity, confirmed by a decrease in pain intensity by DAS28 index. In the dynamics there was a decrease in acute-phase indices—ESR and CRP. Availability of prolonged betamethasone fraction and creation of local subcutaneous "depot" of the drug allowed to apply betamethasone electrophoresis according to the shortened scheme with preservation of the aftereffect. The analysis of adverse events indicated high efficiency and relative safety of the proposed method of treatment.

Conclusion: Physical therapy performed against the background of baseline therapy can reduce the severity of the inflammatory process and shorten the time of RA treatment. The use of betamethasone electrophoresis can be recommended as one of the components of complex treatment of RA at different stages of therapy and can be considered as a substitute for intra-articular injections of glucocorticoids as an available non-invasive method of treatment. In addition, this way of using betamethasone allows you to reduce the risk of unwanted side effects, including osteoporosis.

P1297
ASSESSMENT OF RISK OF OSTEOPOROSIS DEVELOPMENT IN FEMALE ADOLESCENTS WITH DYSMENORRHEA

S. Kulanthaivel[1], E. Kulieva[2], V. Kaliberdenko[2]

[1]Naarayani Multispeciality Hospital, Erode, India, [2] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: Currently, one of the most significant problems of girls in adolescence is menstrual irregularities, which can cause secondary osteoporosis in adolescence. This has a huge human and socio-economic impact. The purpose of the study is to determine various aspects of the development of secondary osteoporosis in girls during adolescence.

Methods: We examined 173 girls aged 13–17 y who were under our supervision in a pediatric clinic. The girls were divided into four groups depending on menstrual irregularities. Depending on their age, the patients were divided into subgroups: girls 13–14 years old – group A, girls 15–17 years old—group B. The patients were divided into four groups depending on the condition. In the 1st group there were girls with delayed puberty [n = 33 + 27], in the 2nd group—girls with primary oligomenorrhea [n = 16 + 46], in the 3rd group—patients with polymenorrhea [n = 18 + 13], in 4th group (control) there were healthy girls [n = 10 + 10].

Results: According to correlation analysis, the influence of steroid hormone levels on bone tissue content has a cumulative effect in girls.

Conclusion: For adolescents with oligomenorrhea, polymenorrhea and secondary amenorrhea, disturbances in the correlations of gonadotropic hormones are observed. The relationships between calcium, phosphorus and magnesium are disturbed, which may indicate a violation of mineralization processes. According to the correlation analysis, direct average correlations between the concentration of steroid hormones and the structural and functional properties of bone tissue were identified in girls with adolescent pathology. The decrease in the concentration of progesterone in the blood of adolescent girls with menstrual cycle pathologies that occurs in connection with dysmenorrhea leads to a significant increase in the risk of developing osteoporosis and progression of scoliosis.

P1298
INDEX OF BONE STRENGTH IN ADOLESCENTS WITH GENERALIZED PERIODONTITIS, SUFFERING FROM IDIOPATHIC SCOLIOSIS, DEPENDING ON THE DEGREE OF SPINAL DEFORMITY

O. Galkina[1], V. Kaliberdenko[1], E. Kulieva[1], K. Khallaev[2]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Dental clinic Dentamed Plyus, Tashkent, Uzbekistan

Objective: The prevalence of musculoskeletal pathology and the high incidence of periodontal pathology in children and adolescents is an important health problem. According to the data, there is a connection between the mechanism of structural and functional disorders of the body and periodontal diseases, which not fully studied yet.

Methods: The study included 108 adolescents aged 15.87 ± 0.09 y with generalized periodontitis (GP) suffering from idiopathic scoliosis (IS). The patients were divided into 3 groups according to the degree of curvature of the spine in accordance with the classification of V.D. Chaklin (1965). Group IS- I – curvature of the spine in the supine position does not disappear, C-shaped, the angle of curvature is up to 10°. Group IS-II – curvature of the spine is C-shaped or S-shaped, the angle of curvature is 11–30°. Group IS-III – S-shaped curvature of the spine, deformation of the ribs with the formation of a hump. The angle of curvature of the spine axis is 31–60°. The index of strength CT (STF,%) also was determined.
Results: The value of the CT strength index decreased with an increase in the degree of curvature of the spine ($p < 0.001$). The STF in the observation groups was as follows. In IS-I – 71.22 ± 8.58%; in IS-II – 62.08 ± 5.87%; in IS-III – 58.71 ± 3.34%. The sigma deviation in the IS-I group was -1.49, which corresponded to osteopenia. In the IS-II group, the deviation was noted at the level of -2.41, which also corresponded to osteopenia, but approached the border of the indicator of osteoporosis. In the IS-III group, the deviation was -2.74, which considered as osteoporosis. There were no differences in indicators depending on gender (p 0.05).
Conclusion: Adolescents with GP and IS in anamnesis have a decrease in the index of strength CT. The decrease in STF in adolescents with GP suffering from IS more pronounced in people with grade II and III scoliosis than in people with grade I scoliosis. These CT disorders can be considered as a systemic disorder of osteogenesis processes.

P1299
TREATMENT OF GENERALIZED PERIODONTITIS BY USING BIORESONANCE STIMULATION IN ADOLESCENTS WITH SCOLIOSIS

O. Galkina[1], V. Kaliberdenko[1], O. Poleshchuk[1], Z. Dovbnya[1], K. Kaladze[1], E. Kulieva[1], K. Khallaev[2]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Dental clinic Dentamed Plyus, Tashkent, Uzbekistan

Objective: The diseases of the musculoskeletal system in some cases are associated with changes in the maxillofacial region. This is due to the unity of mechanisms in the chain of pathology development both in the supporting skeleton and in the bones of the facial skeleton.
Methods: 65 people aged 15–17 y with generalized periodontitis (GP) suffering from scoliosis were examined. The patients were divided into 2 groups – the main group (MG-35 people) and the comparison group (CG-30 people), which are comparable in terms of spinal curvature and gender. The periodontal status was determined in the groups using the oral hygiene index, the degree of gingival inflammation (PMA, Parma), the gingival bleeding index, the Russel periodontal index, CPI, and X-ray examination of the jaws (at the stage of GP diagnosis). The bone strength index (CT; STF,%) was studied using an Achilles + ultrasound densitometer (Lunar-General Electric Medical Systems, USA) before and after GP treatment (3 weeks after the start of treatment).
Results: After the end of GP treatment, there were no significant differences in the change in the values of periodontal indices in the observation groups. Analyzing the dynamics of STF,%, we found that in MG and in CG, the indicators were significantly higher ($p < 0.001$), compared with the values before treatment (in CG – 69.43 ± 7.22% and 71.91 ± 8.17%, respectively; in MG – 70.68 ± 10.11% and 81.71 ± 9.54%, respectively). It is noteworthy that the change in IP K in the exhaust gas was more dynamic ($p < 0.01$), in comparison with HS.
Conclusion: The positive dynamics of SF indicators in the study is regarded as a prognostically favorable sign of improvement in the CT condition of both the alveolar process (dental disease) and the spine (background pathology).

P1300
THE COURSE AND OUTCOMES OF ASEPTIC NECROSIS, DEPENDING ON THE THERAPY

G. Koshukova[1], A. Zayaeva[1], V. Kaliberdenko[1], E. Kulieva[1], S. Kulanthaivel[2]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Naarayani Multispeciality Hospital, Erode, India

Objective: In recent years, there has been an increase in the number of patients with aseptic necrosis (AN) of various joints, which is associated with both a new coronavirus infection and uncontrolled use of glucocorticoids, which is diagnosed at stage II-III, which, when prescribed untimely and insufficient therapy, often requires joint replacement.
Methods: The analysis of clinical cases of the patients with persistent arthralgic syndrome who contacted to rheumatologist of the consultative polyclinic of «Republican Clinical Hospital named after N. A. Semashko".
Results: In the study of 17 patients (12 men and 5 women) aged from 34–67 y (average age 37.2 ± 9.3 y) who had no pathology of the musculoskeletal system with the appearance of persistent arthralgic syndrome after SARS COV-2 infection. According to the MRI results among the patients AN of large joints was founded– 11.8% of shoulder joints, 29.4% of knee joints and 58.8% of hip joints. The X–ray stage II was diagnosed in 6 patients, stage III in 10 patients, and stage IV in 1 patient. All patients received medications that divided into 3 groups: 1st (n = 5)—a combination of NSAIDs + calcium and vitamin D3; 2nd (n = 6) – a combination of NSAIDs + calcium and vitamin D3 + chondroitin/ glucosamine; 3rd (n = 6)—a combination of NSAIDs + calcium and vitamin D3 + bisphosphonates + chondroitin/ glucosamine + dipyridamole, pentoxifylline. The best results were observed in patients of group 3 who showed a decrease in pain syndrome and the absence of an increase in the area of necrosis.
Conclusion: When prescribing complex therapy at the early stages, including calcium, vitamin D3 with osteotropic minerals, bisphosphonates, slow-acting symptom-modifying drugs and drugs that improve the rheological properties of blood, the most favorable outcomes were noted with minimizing the need for surgical treatment. The duration of therapy should not be limited to a period of 3–4 weeks. It is advisable to conduct an MRI examination of the joints in patients in the absence of the effect of NSAID use to diagnose AN at earlier stages and prescribe complex therapy that has shown the best results.

P1301
FREQUENCY OF BONE FRACTURES IN PATIENTS WITH RHEUMATOID ARTHRITIS

A. Useinova[1], V. Kaliberdenko[1], S. Mar'yanenko[1], E. Kulieva[1], S. Khamidova[2]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia, [2]Tashkent State Pedagogic Univ. named after Nizami, Tashkent, Uzbekistan

Objective: Rheumatoid arthritis (RA) is a chronic autoimmune disease characterized by systemic damage to internal organs with the development of erosive arthritis and manifested by a decrease in physical activity, which leads to local and generalized loss of bone tissue with a violation of its microarchitectonics and manifested by frequent fractures.

Methods: The study included 474 RA patients diagnosed between the ages of 25–78, including 217 patients with the onset of the disease aged 25–44 y and 66 patients with the onset of the disease aged $\geq$ 60 y. The patients were divided into 2 groups depending on the age at the time of the onset of the disease, the first group (group I) consisted of patients who became ill at a young age, the second group (group II) included patients with the onset of the disease in old age. The distribution of patients into groups corresponded to the age classification of the WHO. The average age at the onset of the disease in group I was 35.0 years, in group II – 66.2 y. The average age at the time of examination in group I was 50.4 years, in group II – 71.2 y; the duration of RA was 14.4 y and 4.6 y, respectively.
Results: 40 (18%) patients in group I had a history of low-traumatic fractures, and 17 (26%) patients in group II. Among patients with fractures, 23 (57.5%) people received GC therapy for more than 3 months in group 1, and 6 (35%) people in group II. In group I, 16 (40%) and in group II, 3 (18%) people had two or more fractures in the anamnesis.
Conclusion: The fracture rate in the study groups was comparable ($p > 0.05$), despite the difference in age at the time of examination ($p < 0.05$). The frequency of repeated fractures was higher in patients who became ill at a young age, as a result of the long RA and taking GC.

P1302
CHANGES OF REGIONAL HEMODYNAMICS DURING COMPLEX TREATMENT OF PATIENTS WITH MANDIBULAR BODY FRACTURES

K. Kaladze[1], O. Poleshchuk[1], V. Kaliberdenko[1], O. Galkina[1], E. Kulieva[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: It is well known that in the acute period of a traumatic illness, critical disturbances occur in the interdependent activities of the main regulatory systems—hemodynamics, endocrine, and immune. The purpose of this work was to study the recovery period in patients with fractures of the lower jaw under the influence of bioresonance therapy and the drug osteogenon on the process of fracture consolidation and the state of regional hemodynamics.
Methods: All patients first underwent splinting of bone fragments with a splint-brace with hooking loops according to Tigerstedt. The teeth were placed in the bite and fixed with a rubber rod. Bioresonance therapy was carried out according to the method we developed, the course of treatment was 10 procedures. Osteogenon (ossein-hydroxyapatite complex), used mainly for the prevention and treatment of systemic osteoporosis. The course of treatment with the drug is 2 tablets 2 times a day for 14 d. In group III, treatment was carried out according to the generally accepted method. The effectiveness of treatment was assessed by clinical and morphological data and the results of a functional research method (rheography) after immobilization and 2 weeks after the start of treatment. Rheograms were assessed according to 11 main parameters taking into account arterial and venous circulation.
Results: Almost all patients had displacement of bone fragments of the lower jaw. Impaired regional circulation was noted for all main indicators in 89% of patients. There was a decrease in the rheographic index and relative volumetric pulse, an increase in the relative β index, and a decrease in the catacrotic angle, which indicated a violation of both arterial and venous blood flow. After immobilization of the fragments, the bite was clinically restored, and radiographically, the displacement of the fragments was completely eliminated in 68% of cases. There was also a slight decrease in regional blood circulation after the application of splints, which, in our opinion, is associated with the reposition of fragments, since in this case additional damage to soft tissues, vessels, and nerves occurs. Regional blood circulation according to rheography during this period was more intense in patients of group II than in patients of group I and differed significantly from the norm in patients of group III.
Conclusion: Complex treatment of mandibular fractures with the inclusion of bioresonance therapy and osteogenon promotes earlier healing of mandibular fragments, restoration of working capacity and functional indicators.

P1303
INFLUENCE ON LOCAL IMMUNITY OF THE DRUG IMUDON IN COMPLEX TREATMENT OF PATIENTS WITH MANDIBULAR BODY FRACTURES

K. N. Kaladze[1], O. Poleshchuk[1], V. Kaliberdenko[1], O. Galkina[1], E. Kulieva[1], K. K. Kaladze[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: In the acute period of a traumatic illness, critical disturbances occur in the interdependent activities of the main regulatory systems—hemodynamics, endocrine, and immune. Other indicators of the state of the internal environment of the body are also disrupted, which is manifested by a complex set of disorders and adaptive reactions aimed at preserving the vital functions of the body, as well as restoring impaired functions and structures. The purpose of the study. Considering the presence of these disorders, a local immunostimulant was introduced into the complex of treatment measures—the intraoral drug imudon, which stimulates the local immunity of the oral cavity, namely.
Results: The results of clinical and immunological examination of patients indicate a certain relationship between the severity of inflammatory phenomena and the state of the immune system and the influence of these processes on the consolidation of the mandibular fracture. Under the influence of imudon, in patients with mandibular fracture treatment, there was a significant ($p < 0.001$) decrease in lysozyme (by 6.52%) and SIgA (by 9.5%) in the oral fluid. The indicated indicators of local immunity of group I also decreased significantly ($p1 < 0.001$) in comparison with the control group. Less pronounced changes in local immunity after completion of the course of treatment were observed in patients who were treated using traditional methods. The data obtained indicate the pronounced immunomodulatory properties of the drug imudon, which rationally affects the immune status of the oral cavity.
Conclusion: It should be noted that the treatment method we have developed has a stimulating effect on the production of regulatory peptides, increases the body's adaptive abilities and, ultimately, makes it possible to increase the effectiveness of rehabilitation of patients with a mandibular fracture at the stages of inpatient and outpatient treatment.

P1304
RATE OF OSTEODESTRUCTIVE EVENTS IN PATIENTS WITH MULTIPLE MYELOMA THAT USE THE ANALOGUES OF THALIDOMIDE

L. Ametova[1], E. Kulieva[1], V. Kaliberdenko[1], A. Useinova[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: The complications of multiple myeloma caused by osteodestructive processes are one of the most important problems that have a significant impact on the course of the disease, prognosis, and quality of life of patients.
Methods: The study included 19 patients with multiple myeloma (MM) who were on treatment in the Department of Hematology and

Chemotherapy of "Crimean Oncological Dispensary named after N. V. Efetov" in the period from 2019–2022, and received an analogue of thalidomide – lenalidomide.
Results: Osteodestructive processes were identified in 14 (82%) cases. The most frequent localization was observed in the cervical (C4), thoracic (Th10-12) and lumbar (L1-L5) segments of the spine, as well as the humerus and femur, and were represented by fractures. The formation of osteolytic foci in the bones of the pelvis, skull, sternum and visible parts of the ribs with the participation of a soft tissue component also was noted. In the comparison group (patients with MM who are not receiving therapy; n = 54), osteodestructive phenomena also occurred, but the frequency of their occurrence was slightly lower -38 cases—71%. The differences were statistically significant ($p < 0.05$).
Conclusion: An analysis of the frequency of osteodestructive phenomena against the background of the use of a thalidomide analogue, lenalidomide, showed a correlation between the occurrence of the syndrome under study and the use of the drug. At the same time, among patients who did not receive any of the possible drug therapies for multiple myeloma, osteodestructive syndrome was observed 11% less frequently, which indicates a link between bone damage and the use of lenalidomide. The study of the mechanism of occurrence of osteodestructive processes that occur and intensify against the background of taking thalidomide derivatives to assess the benefit-risk ratio, as well as other parameters, for example, the dose-dependent nature of the occurrence of these phenomena, requires further study.

P1305
SKELETAL DYSPLASIA AND GENETIC PREDICTORS

E. Kuliyeva[1], V. Kaliberdenko[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: The number of patients with the signs of connective tissue dysplasia (CTD) has been a significant increase at the last time. The development of CTD is associated with both gene mutations and the influence of adverse environmental factors.
Methods: The analysis of research and scientific literary materials of foreign authors working on the study of skeletal dysplasia and genetic predictors that cause the disease.
Results: CTD deserves special attention in patients with frequent structural and functional disorders of musculoskeletal system (MSS), since a characteristic manifestation of this condition is sensitivity to physical exertion and a tendency to frequent injuries. In this regard, it seems relevant to analyze the presence of morphological signs of CTD in patients in order to determine the directions of prevention and correction of structural and functional disorders of CTD. Thus, according to research, frequent structural and functional disorders of the MSS after physical exertion usually occur in people of asthenic physique. According to the study, the patients with connective tissue dysplasia have limbs in the form of "spider fingers" or arachnodactyly, which is much more common in patients with structural and functional disorders of MMS. In addition, in the group of people with frequent structural and functional disorders of the MSS, kyphotic curvature of the spine with asymmetry of the shoulders, pelvic bones, chest deformities, and flat feet in combination with hallux valgus installation of the feet significantly prevailed.
Conclusion: In all patients with frequent structural and functional disorders of the MSS, there is a syndrome of CTD. In turn, early detection of morphological signs can contribute to the timely appointment of preventive measures in terms of physical activity and appropriate rehabilitation therapy to prevent the progression of the underlying disease.

P1306
EFFECTIVENESS OF EARLY SURGICAL CARE FOR CHILDREN WITH COMPLICATED SPINAL INJURY

A. Useinova[1], V. Kaliberdenko[1], E. Kuliyeva[1], L. Ametova[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: This study is performed for evaluation the effectiveness of surgical treatment of patients with complicated spinal injury at the Department of Traumatology and Orthopedics of the Republican Children's Clinical Hospital.
Methods: From January to June 2022, 7 patients with complicated spinal injury were treated: 4 girls and 3 boys. The average age of patients is 14.7 y. Causes of injury: fall from height (4 cases), road accident (2 cases), sports injury (1 case). All patients suffered injuries to the lumbar spine (LI-LII vertebrae). 2 patients showed neurological deficits in the form of pelvic and motor disorders, the rest had transient movement disorders. Multidisciplinary teams of doctors have been formed for treatment. Patients underwent transpedicular fixation of the spine with laminectomy LI and partially LII. The sizes of screws and beams were selected individually depending on the MSCT data. The number of installed screws per operation varied from 4–8 pieces. Treatment in the intensive care unit lasted 1 d, and in the trauma department on average 26 d.
Results: All 100% of patients achieved stabilization of the damaged spinal motion segment. In 85.7% of patients, the neurological deficit completely regressed; 1 child retained moderate paraparesis of the lower extremities; positive dynamics were observed with the help of crutches. Verticalization occurred on average 3 d after surgery; there were no complications. All patients were transferred to the medical rehabilitation department.
Conclusion: In patients with spinal trauma and neurological disorders, it is recommended to undergo surgery within the first 24 h to prevent complications. This makes it possible to eliminate spinal instability and neurological disorders, reduce the time of treatment and rehabilitation, and return the patient to normal life. To do this, it is important to have a sufficient amount of medical supplies and equipment to provide emergency care around the clock.

P1307
PREVALENCE LEVEL AND COVERAGE OF PATHOGENETIC THERAPY FOR OSTEOPOROSIS AMONG PATIENTS OVER 50 YEARS OLD

A. Useinova[1], V. Kaliberdenko[1], L. Ametova[1], E. Kuliyeva[1]

[1] V.I. Vernadsky Crimean Federal Univ., Simferopol, Russia

Objective: This study is an estimation of the prevalence of osteoporosis (OP) and low-traumatic fractures, as well as to assess the absolute risk of fractures among patients over 50 y of age undergoing medical rehabilitation treatment.
Methods: The study involved patients over 50 y of age undergoing rehabilitation in a hospital; information on age, diseases and previous fractures was collected, and the risk of fractures was calculated using the FRAX model and statistical analysis of the data was carried out using the Microsoft Statistica program.
Results: Questionnaires of 600 patients with an average age of 64.25 ± 10.17 y and a BMI of 29.05 ± 10.8 kg/m^2 were studied, of which 91% of women were postmenopausal. 35.1% of those surveyed had a disability, and the majority underwent rehabilitation due to problems with the musculoskeletal system. A study of the rehabilitation routing scale showed that 85.2% of patients had severe disabilities. More than a third of patients surveyed were at high risk of fractures, especially among women. Less than 18.16% of them underwent bone densitometry of important parts of the skeleton.

30.1% were hospitalized for osteoporotic fractures or osteoporosis. More than a third of the patients surveyed had a high risk of fractures, especially among women, and many did not undergo osteodensitometry at all. 30.1% were hospitalized due to osteoporotic fractures or osteoporosis. A number of patients (5%) mistakenly considered chondroprotectors, painkillers and biologically active food supplements as drugs for the treatment of AP. At the time of the survey, 74 people (12.3% of all subjects) continued any therapy with OP.
Conclusion: The study showed a high prevalence of osteoporosis and the risk of low-energy fractures among patients over 50 years of age undergoing treatment in the medical rehabilitation department, and only 58.5% of them received appropriate pathogenetic therapy.

P1308
OSTEOPOROSIS PREVALENCE, RISK FACTORS, AND THEIR IMPACT ON HEALTH SELF-ASSESSMENT AMONG RURAL URAL WOMEN

V. Kondakova[1], A. Zacroeva[2]

[1]Nevyanskaya CRH, Nevyansk, [2]Ural State Medical Univ., Ekaterinburg, Russia

Objective: Investigate the prevalence of osteoporosis, its primary risk factors, and their correlation with self-rated health and future health prospects in a comprehensive rural sample of women over 50 in the Urals.
Methods: From 2021 to 2022, women over 50 in the rural area of Kalinovo, Sverdlovsk region, were subjected to clinical screening, including FRAX testing and risk assessment for major chronic non-communicable diseases. Parameters like waist circumference, glycemia, plasma cholesterol levels, physical activity, and quality of life (including health self-assessment on a 1–5 scale) were evaluated.
Results: Prior to densitometry, 66.9% were found without osteoporosis risk, and 4.5% were clinically diagnosed based on multiple low-energy fractures and FRAX risk. Post-densitometry, the prevalence of osteoporosis was reassessed. The prevalence of key osteoporosis and chronic disease risk factors was similar to national averages. Notable findings included a high incidence of low body weight and obesity.
Discussion: The data suggests a possibly lower diagnosed osteoporosis rate among rural residents compared to urban populations. However, real prevalence might be higher if densitometry was accessible to all women at risk according to clinical assessments.
Conclusion: Osteoporosis prevalence in rural areas might be lower than in urban populations, but high risk factor frequency, limited access to densitometry, and high mortality from hip fractures potentially underrepresent the burden of osteoporosis in rural communities.

P1309
SIGNIFICANCE OF THE JOINT APPARATUS FOR STABILIZATION OF ACROMIOCLAVICULAR JOINT

O. Byrianov[1], V. Kvasha[1], D. Chekushyn[1], Y. Sobolevskiy[1]

[1]Bogomolets National Univ., Kyiv, Ukraine

Objective: To define the significance of the ligaments in stabilization of the acromioclavicular joints by the digital mathematical imitation.
Methods: The software KOMPAS-3D has been used to reproduce the imitation model, in order to obtain the clavicle and scapula models, most approximated to the real, considering the anatomical peculiarities. The numeric model simulation of the scapula-clavicle deformations by numerous combinations of injured ligaments was held with numeric package Ansys Workbench, using the module static structural. In this simulation, the clavicle and scapula were represented as the rigid bodies – absolutely hard bodies with endless rigidity.
Results: The "clavicule-scapula" system rigidity, depending on the affected structures of:
a) the acromial-clavicular joint ligaments are unaffected, healthy condition is rigidity 19.5 N/mm.
b) injury of lig. Conoideum—15.1 N/mm.
c) injury of lig. Trapezoideum – 16 N/mm.
d) injury of lig. Acromioclaviculare superior – 13 N/mm.
e) injury of lig. Acromioclaviculare inferior—14.8 N/mm.
f) injury of lig. Acromioclaviculare superior plus inferior—8.5 N/mm.
g) injury of lig. Conoideum plus lig. Trapezoideum—11.6 N/mm.
Conclusion:
1. Loss of the rigidity in the system "clavicle-scapula" is more significant under the injuries of the lig. acromio-clavicular superior and inferior (8.5 N/mm) than under the injuries of the lig. conoideum and lig. trapezoideum (11.6 N/mm).
2. A widespread term "lig. Coracoclaviculare" presents significant difficulties, as it completely drops function of the lig. trapezoideum and lig. conoideum, thus, providing incorrect background for the operative interventions, aimed at restoring this region of the stabilizing acromial-clavicular joint complex.

P1310
POLYPLANAR LATERAL FIXATION OF SUPRACONDYLAR HUMERUS FRACTURES IN CHILDREN AND ADOLESCENTS

O. Burianov[1], V. Kvasha[1], V. Naumenko[1], D. Kovalchuk[1], O. Pylypchuk[1]

[1]Bogomolets National Univ., Kyiv, Ukraine

Objective: To provide a comparative analysis of treatment outcomes in children and adolescents with supracondylar humeral fractures treated with cross- and multiplane lateral fixation.
Methods: The outcomes of 183 patients with supracondylar humerus fractures from 2019–2022 were reviewed in this retrospective analysis. Patients were aged 7.38 ± 0.34 y. Clinical and instrumental examinations were performed when first diagnosed, treated and after fracture consolidation. The type of fracture was determined using the AO Pediatric Comprehensive Classification of Long-Bone Fractures (PCCF). Treatment outcome was assessed using the Mayo Clinic Elbow Performance Score (MEPS). The study included two groups: control (102 patients with crossed fixation) and main (73 patients with polyplane fixation). The comparative statistical analysis of the two groups, based on sex, age and type of bead, shows their reliability ($p > 0.005$). A polyplane navigator was used to ensure fragment fixation in the main group.
Results: The study found that the functional results of the treatment were unsatisfactory. In the control group, the unsatisfactory results were 6.1% for closed reduction with percutaneous fixation and external immobilization, and 8.8% for open reduction with pinning and external immobilization. In the main group, the unsatisfactory results were 5.1% for closed reduction with percutaneous fixation and external immobilization, and 6.8% for open reduction with pinning and external immobilization. Furthermore, the control group experienced iatrogenic ulnar nerve damage in 2.7% of cases, whereas this complication was absent in the main group of patients.
Conclusion: Polyplanar lateral fixation is a reliable method for fragment stabilization of supracondylar humeral fractures in children and adolescents. This method allows early post-trauma rehabilitation and improves functional outcomes. The possibility of iatrogenic ulnar nerve damage is also completely eliminated.

P1311
SECONDARY OSTEOPOROSIS IN PATIENT WITH NONSPECIFIC ULCERATIVE COLITIS: CASE REPORT

V. Labashova[1], Y. Dydyshka[1], V. Vadzjanova[1]

[1]Belarusian State Medical Univ., Minsk, Belarus

An important part of diagnostic and treatment of osteoporosis is the exclusion of secondary forms resulting from various pathological conditions and diseases. The success is largely determined by the awareness of doctors of various specialties and the possibility of long-term monitoring of the patient.

Case report: 59 years old female admitted for endocrine assessment due to revealed hypercalcemia. She suffered from lumbar bone pain, but did not pay much attention on it. She had no pathological fracture. Her height decreased by 2 cm for the last 10 y. Menopause lasted for 4 y. Initial chemistries showed serum calcium 2.9 mmol/l (2.2–2.55), phosphate 1.03 mmol/l, alkaline phosphatase 89 U/l, creatinine 68 umol/l. The rest of her laboratory results were unremarkable. During the examination ultrasound showed pathological zone near the right lobe of thyroid gland 9 × 5*7 mm (parathyroid gland?) Later laboratory investigations confirmed raised serum calcium 2.82 mmol/L, increased PTH 24.82 pmol/l (1.45–10.41) and deficiency 25-hydroxyvitamin D—21 nmol/l. DXA showed L1-4 T-score = -2,6 SD, total hip T-score = -1.7SD. The thorough examination of medical history revealed nonspecific ulcerative colitis that patient defined as a remission for at least 7 y. She was initiated vitamin D replacements. Hyperparathyroidism was determined as a secondary, osteoporosis was categorized M81.8—other osteoporosis without current pathological fracture. Follow up BMD 12 months lumbar spine BMD increased by 6.1% and total hip BMD increased by 5.2%. Serum calcium was 2.62 mmol/L, PTH 14.3 pmol/l (1.45–10.41) and 25-hydroxyvitamin D—43 nmol/l.

Conclusion: This case report aims to detect the importance of the exclusion a secondary reasons of osteoporosis.

P1312
OUR EXPERIENCE WITH DENOSUMAB AS A THERAPEUTIC TARGET IN PATIENTS WITH BREAST CARCINOMA

V. P. Popova[1], M. P. Geneva- Popova[2], S. P. Popova-Belova[2], M. D. Doykov[3], S. V. Valkanov[3], I. P. Popov[4]

[1]Dept. of Rheumatology, Medical Faculty, Medical Univ. of Plovdiv, [2]Dept. of Rheumatology, Medical Faculty, Medical Univ. of Plovdiv, [3]Dept. of Urology and General Medicine, Medical Faculty, Medical Univ. of Plovdiv, [4]Medical Faculty, Medical Univ. of Plovdiv, Plovdiv, Bulgaria

Objective: RANK blockade may play a central pathogenetic role in the tumorigenesis of breast carcinoma and some other tumors, as well as in their metastasis. Inhibition of the RANK/RANKL/OPG axis is key to the treatment of patients with metastatic tumors.

Methods: Breast cancer patients (N-78)—in II A and B and IIIA st TNM, according to the 8th revision of the American Joint Committee on Cancer (AJCC), divided into 2 main groups with (N-40) and without (N-38) osteoporosis. Inclusion criteria: Patients operated for breast carcinoma and on adjuvant treatment with aromatase inhibitors with high baseline levels of CA 15–3 and CEA-2 times above their upper reference value. Patients with osteoporosis are treated with a standard dose every 6 months with Denosumab, and the other group is a control group—with monitoring of tumor markers. Periodicity of the evaluation of the results is for 36 months. Screening of tumor markers is done at 0–6-12–24 and 36 months, DXA at 24 and 36 months. PET/ CT scan—baseline, at 12, 24 and 36 months.

Results: A significant decrease in the levels of tumor markers in the group treated with denosumab—in 65% of the patients treated with denosumab—they normalized as early as the 12th month, in 15% lower their levels by 50% of baseline levels, becoming permanent until the end of the observed period. Improved BMD ($P < 0.0001$) in the denosumab treatment group after 24 m (+ 8.5%) and 36 months (+ 10.6%), missing PET/CT scan data for local and/or distant metastasis.

Conclusion: Denosumab plays an important pathogenetic role in the treatment of patients with carcinomas and, in addition to improving BMD, it also affects markers related to metastasis and tumor progression, as well as having a good prognostic safety profile, even at doses lower than those used in metastatic tumors. Limitations—a small group of patients.

P1313
EXAMINATION OF THE LEVEL OF VIT D IN PATIENTS WITH OSTEOARTHRITIS OF THE KNEE JOINT

V. P. Popova[1], M. P. Geneva- Popova[2], S. P. Popova-Belova[2], M. D. Doykov[3], S. V. Valkanov[3], I. P. Popov[4]

[1]Dept. of Rheumatology, Medical Faculty, Medical Univ. of Plovdiv, [2]Dept. of Rheumatology, Medical Faculty, Medical Univ. of Plovdiv, [3]Dept. of Urology and General Medicine, Medical Faculty, Medical Univ. of Plovdiv, [4]Medical Faculty, Medical Univ. of Plovdiv, Plovdiv, Bulgaria

Objective: Osteoarthritis of the knee joints is a socially significant disease with a high rate of disability, leading indirectly to high mortality. Etiopathogenesis still has its ambiguities, but the role of calcitriol in this process is undisputed. The presence of vit D receptors (VDR) in striated muscle and chondrocytes, with relevance to their functionality and joint damage in osteoarthritis.

Methods: Retrospective study of 250 patients with OA of knee joints in Ro stage 2 (N- 76), Ro stage 3 (N- 124) and Ro stage 4 (N—50) according to Kellgren-Lawrence, with a study of serum levels of vit D once a year for 2 y, Po staging at 2 y. All patients received replacement therapy with calciumtriol 5000 IU daily.

Results: Vitamin D deficiency was found at the baseline in all three groups—in the patients as in the patients with 2 Rö stage in 54 (71%) with an average baseline level—23.4 ng/ml, in the group in 3 Ro stage in 87 (70%) 21.5 ng/ml, and in the group in 4 Ro stage in 46 patients (92%) the average value of calciferol was 24 ng/ml. The examination of the serum level in the 1st and 2nd years show persistence of vit. D deficit in all three groups, as follows: in the group with 2 Rö stage at 36% (N 27) in the 1st year and at 26% (N20) in the second year, In 3 Rö st. after 1 year at 39% (N 48) and 31% (N 38) in the 2nd year have a persistent vitamin D deficiency. In addition, in the absence of dynamics in the other factors related to OA, there is a worsening of its severity—a transition of 17% (N13) of the patients from the 2nd to the 3rd Ro stage. And in 26% (N20) there is a transition from 2 in 4 Rö st., also 33% (N41) pass from 3 to 4 Rö st.

Conclusion: Vitamin D has multiple pleiotropic effects Persistent vitamin D deficiency could be associated with deterioration of joint function and of local status with a transition to a higher Rho stage. Larger studies and timely replacement treatment are needed.

P1314
FIRST FRACTURE LIAISON SERVICE IN CROATIA: LEARNING THROUGH EXPERIENCE

A. Zrilic Vrkljan[1], M. Hrabar[1], J. Andric[1], S. Marusic[1], V. Pandzic Jaksic[1]

[1]Dept. of Endocrinology, Diabetes, Metabolic Diseases and Pharmacology, Dubrava Univ. Hospital, Zagreb, Croatia

Objective: The everyday practice of not receiving timely osteoporosis treatment after fragility fracture has been a long-standing unresolved issue in Croatia. In Dubrava University Hospital we finally implemented a Fracture Liaison Service (FLS) led by the Department of Endocrinology and including fragility fracture patients admitted to the Department of Traumatology and Orthopedics. After a period of adaptation, we achieved stable FLS screening and treatment initiation, so we aimed to analyze the results.
Methods: During 12 months between November 2022 and 2023, we screened 340 patients. After clinical and laboratory investigations we excluded 32 patients because of contraindications for osteoporosis treatment, 21 patients that died, and 10 that could not be contacted. From the remaining total of 277 patients that were followed through FLS 67 (24.2%) patients received in-hospital osteoporosis therapy or treatment recommendations and 210 were released with vitamin D supplementation and scheduled for endocrinologist visits the day when the first surgical control was planned. We collected demographic and clinical data and compared two groups: 139 (50.2%) patients who returned for consultation and received treatment and 71 (25.6%) patients who skipped recommendations and did not receive osteoporosis therapy.
Results: Patients who did not return for osteoporosis treatment after hospitalization were more often femoral fracture patients ($p = 0.02$), but they did not differ in age, gender, and presence of comorbidities like diabetes or malignant diseases. They also were less likely to take vitamin D supplementation before fracture ($p < 0.01$), their 25OH-vitamin D was lower ($p = 0.017$) and they had more secondary hyperparathyroidism ($p = 0.02$) but did not differ in other causes of secondary osteoporosis. Further analysis showed that although not showing up for endocrinologist consultation, 51 out of those 71 patients did return for surgical follow-up.
Conclusion: While huge improvements in comparison to previous practice without FLS are evident, we need to find effective modalities to initiate osteoporosis treatment in patients with the worst mobility. However, the fact that they mostly reached hospital for surgical follow-up suggests that a large improvement should be undertaken in patient education and general awareness about secondary fracture prevention. The initiation of osteoporosis treatment is only the beginning and long-term patient adherence with FLS supervision should be the goal.

P1315
SERUM 25-HYDROXYVITAMIN D LEVELS AND PSYCHOLOGICAL DISTRESS SYMPTOMS IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

V. Pankiv[1]

[1]Ukrainian Scientific and Practical Center of Endocrine Surgery, Transplantation of Endocrine Organs and Tissues of the Ministry of Health of Ukraine, Kyiv, Ukraine

Objective: Type 2 diabetes mellitus pandemic has given rise to stress worldwide, especially in vulnerable people like those suffering from mental illness. This study aims to investigate the psychological distress perceived by a cohort of patients with major depressive disorder (MDD), and to analyze serum 25-hydroxyvitamin D [25(OH)D] levels as a potential predictor of distress severity.
Methods: 97 remitted MDD patients with type 2 diabetes were enrolled. An online dedicated survey was administered to evaluate diabetes related distress by using Psychological Distress Scale. Patients' medical records were reviewed to collect sociodemographic and clinical data, including serum 25(OH)D levels. A multivariate general linear model was adopted to test the effect of factors of interest on psychological distress.
Results: In our sample ($n = 97$), 28 subjects (28.9%) reported no likelihood of psychological distress, whereas 34 (35.1%) and 35 (36.0%) displayed mild and moderate-to-severe likelihood of psychological distress, respectively. Low serum 25(OH)D levels ($p = 0.05$) and MDD diagnosis ($p = 0.01$) specifically predicted the severity of psychological distress. Living alone, a longer duration of illness, and smoking habits were more frequently detected in subjects with diabetes related distress.
Conclusion: Low serum 25(OH)D levels and MDD diagnosis predicted an increased vulnerability to the stressful impact of the type 2 diabetes. Our results suggest that vitamin D may represent a biological factor mediating the psychological response to stress in individuals with affective disorders and provide further insight into tailoring intervention strategies.

P1316
ANALYSIS OF CAUSES AND RESULTS OF TREATMENT OF COMPLICATIONS AFTER HIP ARTHROPLASTY

V. Pidgaietskyi[1], T. Nizalov[1], M. Pidgaietskyi[1]

[1]SI "Institute of traumatology and orthopedics, AMS of Ukraine", Kyiv, Ukraine

Objective: To study the causes and results of treatment of complications of hip replacement.
Methods: The basis of the work was the analysis of the results of treatment of 364 patients with complications after hip replacement in 369 cases from 2005–2018. The structure of complications was as follows: aseptic loosening—158 cases (42.9%), dislocations of the prosthetic head—41 cases (11.1%), paraarticular heterotopic ossification—30 (8.0%), periprosthetic fractures of the femur—25 (6.8%), pain in the prosthetic joint (not associated with loosening)—35 (9.5%) and infectious complications in 80 cases (21.7%). The work used clinical, radiological, microbiological and statistical research methods.
Results: As a result of statistical analysis, a reliable χ^2 correlation was established between the loosening of the components and: the age of the patients; pathology of the hip joint; outdated prosthesis design; cystic reconstruction of the acetabulum and osteoporosis of the femur. Reliable causes of dislocations of the endoprosthetic head were established: overweight patients, incorrect position of components, small diameter heads using. The causes of paraarticular heterotopic ossification were significant osteophytes of the acetabulum before surgery and significant trauma of the operation. A reliable cause of periprosthetic fractures is osteoporosis of the femur. The cause of the pain syndrome not associated with the instability of the components was the pathology of the spine in the form of degenerative-dystrophic changes in the anterior column of the lumbar spine. The causes of a para-prosthetic infection were: chronic infectious diseases of the internal organs, instability of the components, more than 2 surgical operations carried out on this joint. Regarding the results of treatment of complications, it was found that in patients with instability of the components, the results of the reduction replacement of the latter were the best with minor defects of the acetabulum and femur (type I-II according to Paprosky). The effectiveness of surgical treatment of dislocations is significantly higher compared to their closed

elimination ($\chi^2 = 15$, $p < 0.01$). An effective method of treating heterotopic ossification is their prompt removal. The only effective treatment for periprosthetic fractures in all 100% of cases was an open reduction and osteosynthesis. In the treatment of paraprosthetic infections, sanitizing interventions without removing the components of the endoprosthesis are effective only up to 3 weeks. And in cases when the rehabilitation was inconclusive, effective in a reliable number of cases was two-stage revision prosthetics ($t = 11.2$, $p = 0.0028$), namely 24 cases, which amounted to 92.3%. In the case of vertebrogenic pain syndrome, the best results treatment was found in patients with lesions of the posterior column of the lumbar spine.
Conclusion: It was established that three groups of causes played a role in the development of complications of hip arthroplasty: the causes associated with the patient (overweight, hard physical labor, osteoporosis, cystic reshaping, the presence of inflammatory processes and associated pathologies); causes associated with the surgeon (planning errors and violation of the implantation technique) reasons associated with the design of the prosthesis (outdated prosthesis models and the effect on the body of the wear products of the friction pair). The development of various complications of hip replacement requires surgical revision procedures. It was established that the earlier revision of the hip joint was performed, the better its result.

P1317
CLUSTERS OF MULTIMORBIDITY AND THEIR LINK WITH REHABILITATION PROGRAMS OUTCOMES FOR KNEE OSTEOARTHRITIS

V. SĂLARU[1], L. Mazur-Nicorici[1], M. Cebanu[1], M. Garabajiu[1], N. Loghin-Oprea[1], V. Sadovici-Bobeică[1], S. Vetrila[1], M. Mazur[1], T. Rotaru[1], A. Vizdoaga[1]

[1]Nicolae Testemitanu State Univ. of Medicine and Pharmacy of the Republic of Moldova, Chisinau, Moldova

Objective: Multimorbidity is the co-existence of two or more chronic conditions in an individual, and is a common problem for patients in rehabilitation programs. Comorbidities are highly associated with knee osteoarthritis (OA), however different patterns of associated diseases could influence differently the outcomes of the physical rehabilitation program. We aimed to determine the impact of different multimorbidity clusters on the rehabilitation program outcomes in patients with knee osteoarthritis.
Methods: A prospective control case study was conducted in the University Rehabilitation Centre. The 138 consecutive OA patients underwent clinical examination, pain level according to the VAS scale, and Knee Injury and Osteoarthritis Outcome Score (KOOS) with 5 domains (Pain, Symptoms, ADL, Sport, QoL) for joint function assessment. Patients were classified into 3 clusters according to the profile of associated diseases: cluster 1- cardiovascular (hypertension, heart failure, atrial fibrillation, vascular or ischemic heart diseases), cluster 2-metabolic (diabetes mellites, obesity, fatty liver) patients, and cluster 3- mixt (cardiometabolic). The assessment was performed before (T0) and 10 d after following a standard rehabilitation program (T1).
Results: The cluster no. 1 (cardiovascular) contained 44 patients (32 females), mean age of 60,70 ± 1,2 y, in cluster no. 2 were 24 patients (14 females), with a mean age (M ± m) 64,38 ± 3,2 y, and cluster no. 3—70 patients (63 females), mean age 64,04 ± 0,9 y. The data from the pain and joint functionality assessment are presented in Table 1. At the initial assessment, the highest level of pain and lower joint function were in cluster 2 with similar data for cluster 3 ($p > 0,05$). After the 10 d of the standard rehabilitation program, significant improvements in joint function and pain control were identified in all 3 groups ($p < 0,01$). However, better results were in the cardiovascular cluster. The patients from the metabolic and mixt groups presented similar results, except for the KOOS symptoms in which the patient with metabolic multimorbidity had less control of OA symptoms.

Table 1. Functionality and pain level in 3 clusters of multimorbidity

Parameters	VAS	KOOS Pain	KOOS Symptoms	KOOS ADL	KOOS Sport	KOOS QoL
T0						
Metabolic	65,8±3,2	45,7±4,3	44,1±3,6	38,3±3,0	11,6±4,6	26,8±4,4
Met. vs. Cardio.	p<0,01	p<0,01	p<0,001	p<0,01	p<0,01	p<0,01
Cardiovascular	52,2±2,8	61,8±3,1	71,3±2,9	53,5±3,4	28,3±4,5	44,0±3,5
Cardio. vs. Mixt	p<0,001	p<0,01	p<0,001	p<0,001	p<0,001	p<0,001
Mixt (Cardiometabolic)	65,8±1,7	50,1±1,6	55,0±1,8	40,5±1,7	8,0±1,0	23,6±2,2
Met. vs. Mixt	p>0,05	p>0,05	p<0,01	p>0,05	p>0,05	p>0,05
T1 (after 10 d of a standard rehabilitation program)						
Metabolic	38,1±2,7	57,7±3,4	55,2±3,2	49,1±2,7	24,9±4,9	41,1±4,3
Met. vs. Cardio.	p<0,05	p<0,01	p<0,001	p<0,001	p>0,05	p<0,05
Cardiovascular	30,0±2,3	70,4±2,7	79,4±2,4	63,4±3,1	37,8±4,3	53,0±3,1
Cardio. vs. Mixt	p>0,05	p<0,001	p<0,001	p<0,001	p<0,001	p<0,001
Mixt (Cardiometabolic)	35,3±1,7	59,3±1,6	64,4±1,8	50,2±1,7	18,3±1,2	35,3±2,2
Met. vs. Mixt	p>0,05	p>0,05	p<0,05	p>0,05	p>0,05	p>0,05

Conclusion: Multimorbidity clusters were differentially associated with functional capacity and pain level in patients with osteoarthritis. Thus, the association of metabolic comorbidities appears to be related to worsening joint function and poor outcomes after the rehabilitation program.

P1318
CORRELATION OF VITAMIN D VALUES WITH BMI AND CRP LEVELS IN PATIENTS WITH EARLY SYMPTOMS OF INFLAMMATORY ARTHRITIS

A. Zoto[1], V. Salko[1]

[1]UHC"Mother Theresa", Tirana, Albania

Objective: Inflammatory arthritis affects people of every age, gender and ethnic background. Genetics, age and lifestyle can all play a part in increasing one's risk of developing inflammatory arthritis. Vitamin D is believed to have an immunomodulatory and anti-inflammatory action, and its deficiency has been linked with several autoimmune disorders, including rheumatoid arthritis (RA). We studied the correlation of vitamin D values with BMI and CRP levels in patients suspected or recently diagnosed with rheumatoid arthritis (RA) according to 2010 EULAR/ACR criteria, which haven't started specific therapy yet.
Methods: 65 patients suspected or diagnosed with RA are included in this study. No DMARDs have been started at the moment of evaluation. Beside other required examinations are included: vitamin D level, CRP and BMI calculation.
Results: Patients mean age (± SD), 47,3 yo (± 10.3). 25 patients included in the study have BMI < 25 kg/m^2,in this group mean value of vitamin D in the moment presented at doctor office is 35 ng/mL (sufficient range 30–60 ng/mL)and the mean value of CRP in this group resulted 1.1 ng/L (normal value CRP < 1 ng/L). The rest of 40 other patients resulted with BMI > 25 kg/m^2,in this group mean value of vitamin D in the moment presented at doctor office is 28 ng/mL and the mean value of CRP in this group resulted 1.8 ng/L.
Conclusion: An inverse correlation of BMI and Vitamin D levels was confirmed. Also a higher level of CRP was observed in patients with lower vitamin D level.

P1319
OSTEOPOROSIS IN PATIENTS WITH METABOLIC SYNDROME

A. Zoto[1], V. Salko[1], T. Backa[1]

[1]Rheumatology Service, Univ. Hospital Center "Mother Theresa", Tirana, Albania

Objective: Incidence of osteoporosis in patients with metabolic syndrome.
Methods: All patients included in the study were diagnosed with metabolic syndrome. The average duration of the disease is 5 y. 110 patients were included from which 60 females and 50 males. Post menopausal women were excluded from the study. The average age was 48 years old. Biochemical parameters, vitamin D level, calcium level were requested in every patient and also DXA at the femoral neck and lumbar spine were measured, including also BMI. Cut off of DXA to define osteoporosis is T-score $\leq$ -2,5.
Results: Out of 110 (100%) patients, 76 (69%) resulted with osteoporosis. In 60 (100%) female patients, 53 (88%) had osteoporosis. Out of 50 (100%) male patients, only 23 (46%) of them were diagnosed with osteoporosis. In the total of 76 (100%) patients with osteoporosis, 48 (63%) of them had osteoporosis only in the coxofemoral joints, 9 patients (12%) exclusively in the lumbar part and 19 patients (25%) in both coxofemoral and lumbar regions.
Conclusion: Metabolic syndrome is associated with a high incidence of osteoporosis in both female and male patients. The coxofemoral joints are the region most affected by osteoporosis. Patients with metabolic syndrome should be examined periodically for early diagnosis of osteoporosis and follow up should be mandatory in patients with established diagnosis of osteoporosis.

P1320
TOWARDS BEST PRACTICE WHEN DISCONTINUING DENOSUMAB: AN AUDIT OF THE BELFAST EXPERIENCE

V. Stokes[1], A. Baird[2], J. Cheng[3], C. Donaghy[4], G. Heyburn[2], J. Lindsay[5], B. Roberts[1], P. Hamilton[1]

[1]Dept. of Clinical Biochemistry, Royal Victoria Hospital, Belfast Health and Social Care Trust, [2]Dept. of Trauma and Orthopaedics, Musgrave Park Hospital, Belfast Health and Social Care Trust, [3]Dept. of Care of the Elderly, Musgrave Park Hospital, Belfast Health and Social Care Trust, [4]Dept. of Rheumatology, Musgrave Park Hospital, Belfast Health and Social Care Trust, [5]Dept. of Endocrinology, Royal Victoria Hospital, Belfast Health and Social Care Trust, Belfast, UK

Objective: Denosumab is commonly used in the treatment of osteoporosis, but stopping it has been associated with a rapid fall in bone density and an increase in fracture risk; best practice around the discontinuation of denosumab remains uncertain. We sought to audit local osteoporosis prescribing practice following denosumab discontinuation and assess subsequent fracture risk.
Methods: Electronic healthcare records were analysed for 37 patients in whom denosumab therapy was discontinued. The duration of treatment, subsequent drug prescriptions and incidence and nature of fractures post-discontinuation was noted.
Results: Denosumab had been used for between 3–10 y. After discontinuation, treatment options included oral bisphosphonate treatment for 6, 12, 18 or 24 months, or 1, 2 or 3 annual doses of intravenous zoledronic acid. Full data, including bone densitometry data from around 2 y post-discontinuation, was available for 19 patients. 32% of these patients had an incident fracture after stopping denosumab; 21% of these fractures were vertebral. 41% of patients had bone turnover markers checked to assist with therapeutic decision-making. In the 6 patients who received zoledronic acid, only half maintained the gain in BMD obtained with denosumab, and a third sustained a fracture.
Conclusion: Stopping denosumab is difficult as this practice is often associated with a decline in BMD and subsequent risk of fracture. Subsequent treatment with a bisphosphonate is often initiated in an attempt to attenuate this risk, but the data presented here suggest that this practice is not particularly effective. Better evidence-based strategies for stopping denosumab are urgently required.

P1321
ASSESSMENT OF MOTOR ACTIVITY OF PATIENTS UNDERGOING MEDICAL REHABILITATION

V. Vasileva[1], L. Marchenkova[1], A. Fesyun[1]

[1]Federal State Budgetary Institution "National Medical Research Center of Rehabilitation and Balneology" of the Ministry of Health of the Russian Federation, Moscow, Russia

Objective: To study the nature and degree of disorders of muscle strength, motor and coordination functions in patients undergoing medical rehabilitation and sanatorium treatment.
Methods: Single cross-sectional study included 160 patients aged 40–65 y with normal and overweight. The complex of the study included: functional tests and assess muscle strength and balance.
Results: In patients with obesity, compared with persons with normal body weight of the same age, significantly ($p < 0.05$) lower indicators of muscle strength of the right and left arms, strength of the abdominal and back muscles, lower endurance of the abdominal muscles and back muscles and longer time to complete the "get up and walk" test. Also, in obesity, it turned out to be significantly less time to maintain balance in the "stand on one leg" tests on the right and left legs with open eyes. A statistically significant direct relationship was found between the level of back muscle strength ($\gamma = -0.82$, $p = 0.0038$) and body weight. A significant relationship was also found between the level of endurance of the back muscles to physical activity and BMI, $\gamma = -0.79$, $p = 0.01$. At the same time, there was no relationship between age and the level of endurance of the back muscles to physical activity ($\gamma = 0.107$, $p = 0.36$).
Conclusion: In patients with obesity at the age of 40–65 y, compared with persons with normal body weight of the same age and gender, there is a statistically significant decrease in the muscle strength of the arms, abdomen and back, a longer time to complete the "get up" test and walk", as well as deterioration in the function of static balance according to the results of the "stand on one leg" test.

P1322
EFFECTIVENESS OF COMPLEX MEDICAL REHABILITATION OF PATIENTS WITH POSTTHROMBOPHLEBITIC SYNDROME AND OBESITY

V. Vasileva[1], T. Konchugova[1], T. Apkhanova[1], O. Yurova[1], A. Fesyun[1]

[1]Federal State Budgetary Institution "National Medical Research Center of Rehabilitation and Balneology" of the Ministry of Health of the Russian Federation, Moscow, Russia,

Objective: Comparative study of the influence of complex methods of medical rehabilitation, including various methods of laser blood irradiation (supravascular and intravenous), pulse magnetotherapy and dry carbon baths, on the dynamics of indicators of composite body composition according to bioimpedance measurements in patients with post-thrombophlebitic syndrome (PTPS) of the lower extremities and obesity.

Methods: A randomized prospective study was conducted on the basis of the Department of Medical Rehabilitation of Patients with Somatic Diseases of National Medical Research Center of Rehabilitation and Balneology of the Ministry of Health of Russia. The study included 40 patients with PTS of the lower extremities and accompanying obesity, the average age of which was 58.3 [51.5; 68.0] y), randomized to two groups. The patients of the 1st group received Intravenous laser blood irradiation (ILIB) (Lazmik, Russia), impulse magnetotherapy and dry carbon baths, as well as therapeutic gymnastics in the hall. The patients of the 2nd group received a complex that included supravascular laser irradiation of blood («Azor-2 K», Russia), pulse magnetic therapy, and dry carbon baths, as well as therapeutic gymnastics in the gym. Anthropometric measurements (body mass, malleolar volume) were used for the evaluation of antiedema and lipolytic effects after a comprehensive course of medical rehabilitation, as well as bioimpedance measurement of body composition ("MEDASS", Russia).
Results: In patients with PTS of the lower extremities and obesity, after carrying out a course of medical rehabilitation using preformed physical factors, including various methods of laser irradiation of the blood (supravascular and intravenous), a significant decrease in body weight indicators was observed ($p < 0.001$), a decrease in BMI ($p < 0.001$), total and extracellular fluid ($p < 0.001$) without significant differences between groups. A significant decrease in the index of fat mass (kg) ($p = 0.007$) was found in patients of the main group.
Conclusion: The method of bioimpedance measurement, used for the evaluation of the composite composition of the body, showed high sensitivity and allowed to establish the greater effectiveness of the developed complex, which includes ILIB with a wavelength of low-intensity laser radiation (NILI) of 635 nm in reducing fat mass.

P1323
ASSESSMENT OF QUALITY OF LIFE AND ANTHROPOMETRIC INDICATORS IN PATIENTS WITH METABOLIC SYNDROME UNDER THE INFLUENCE OF A NON-DRUG COMPLEX

V. Vasileva[1], A. Fesyun[1], T. Konchugova[1], T. Apkhanova[1], O. Yurova[1], D. Kulchitskaya[1]

[1]Federal State Budgetary Institution "National Medical Research Center of Rehabilitation and Balneology" of the Ministry of Health of the Russian Federation, Moscow, Russia, Moscow, Russia

Objective: Research of the effectiveness of a non-drug treatment method, including physiotherapeutic factors of general and local influence during physical activity and exercise therapy methods (balance therapy, hydrokinesitherapy, group physical therapy exercises in the gym, cycling training using a bicycle ergometer) compared with the use of physical therapy alone in patients with metabolic syndrome (MeS).
Methods: A randomized prospective study was conducted at the Department of Medical Rehabilitation of Adults for Patients with Somatic Diseases in the Federal State Budgetary Institution "National Medical Research Center" No. 2 of the Ministry of Health of Russia. The study included 40 patients with MeS, whose average age was 52.42 [48.0; 57.0] y, randomized into two groups. Patients of the 1st group received a complex non-drug method, including pneumocompression, electronic lymphatic drainage, transcranial magnetic stimulation and physical therapy methods, using balance therapy, hydrokinesitherapy, group therapeutic exercises in the hall and cycling training using a bicycle ergometer. Patients of group 2 received only a complex including the above methods of physical therapy. A course of non-drug treatment for patients in both groups was carried out against the background of a low-calorie diet.
Results: Patients of the main group after a course of non-drug treatment showed a significant decrease in body weight in kg ($p < 0.001$), a decrease in BMI in kg/m^2 ($p < 0.001$), and an improvement in overall mental wellbeing (GWB) ($p < 0.001$) and general physical wellbeing (GPW) ($p < 0.01$). Also, after the course of treatment, patients in group 1 (main) showed a significant decrease in waist circumference and hip circumference in cm ($p < 0.05$), compared with group 2, according to the Mann–Whitney test. The study obtained reliable data on the deterioration of OPB in the comparison group.
Conclusion: The use of a complex non-drug treatment method using electronic lymphatic drainage, pneumocompression, transcranial magnetic stimulation along with the use of exercise therapy methods led to an improvement in overall quality of life due to improvements in GPW and GWB on the corresponding scales.

P1324
COMPREHENSIVE ANALYSIS OF OMEPRAZOLE'S PROLONGED IMPACT ON BONE HEALTH AND FRACTURE RISK IN PATIENTS RECEIVING CALCIUM, VITAMIN D, AND ANTIRESORPTIVE THERAPIES

V. Vyskocil[1], R. Stepanova[2], M. Simeckova[3]

[1]Charles Univ. Hospital Osteocentre Dept. of Medicine II, Pilsen, [2]Anova CRO Praha, Praha, [3]ANOVO, Praha, Czech Republic

Objective: The investigation involved a cohort of 399 patients subjected to omeprazole treatment for a duration exceeding 2 y, with the objective of assessing its potential adverse impact on BMD in individuals concurrently administered with calcium, vitamin D, and antiresorptive drugs. A control group, comprising 340 patients, was meticulously selected to mirror the demographics of the study group. The principal endpoints encompassed alterations in BMD at the spine and hip, the incidence and specific localization of fractures, including the hip, spine, upper limbs, lower limbs excluding the hip, and other anatomical regions.
Methods: An analysis was conducted to scrutinize the influence of both the dosage and duration of omeprazole treatment, as well as BMD, on changes in the spine and hip (referred to as the active group). Additionally, the impact of vitamin D levels was investigated, with thresholds set at 50 nmol/L and 75 nmol/L. A substantial majority of treated patients exhibited a BMI exceeding 25 (81.1%), and in turn, exceeding 30 (44.5%). Notably, 81.7% of patients registered vitamin D values surpassing 50 nmol/L. The mean age of the cohort was 72.5 ($\pm$ 4.32) y. The prevalent dosage of omeprazole was 40 mg in 44.1% of cases and 20 mg in 40.6% of cases. The mean treatment duration was 6.4 ($\pm$ 3.23) y. Statistical testing involved the utilization of the t-test for independent groups, linear models, and Poisson regression.
Results: No statistically significant distinctions were discerned in BMD at the spine and left hip between the groups. The influence of omeprazole dosage and treatment duration, as scrutinized by a linear model, failed to attain statistical significance for both variables. Similarly, the effect of BMI on BMD percentage change in the spine or hip did not achieve statistical significance, irrespective of the BMI threshold set at 25 kg/m^2 or 30 kg/m^2. Vitamin D treatment exhibited no statistically significant impact on BMD changes in the hip or spine within both subgroups, considering thresholds of 50 nmol/L and 75 nmol/L. Furthermore, neither the dosage nor the duration of omeprazole treatment manifested an effect on the incidence of fractures. No statistically significant association was observed between the dose and duration of omeprazole treatment and the occurrence of fractures at the specified anatomical locations.

Conclusion: The purported impact of omeprazole dosage or treatment duration on BMD or fracture occurrence did not attain significance, when accounting for vitamin D levels and BMI. Additional scrutiny involving an expanded sample size and the incorporation of updated clinical data is imperative for a comprehensive understanding of the observed phenomena.

P1325
COMPARATIVE ANALYSIS OF BONE CEMENT IMPLANTATION SYNDROME IN CEMENTED BIPOLAR HEMIARTHROPLASTY: INFLUENCE ON PATIENTS WITH AND WITHOUT PREEXISTING HEART CONDITIONS

V. Yuenyongviwat[1], J. Janejaturanon[1], K. Iamthanaporn[1]

[1]Dept. of Orthopedics, Faculty of Medicine, Prince of Songkla Univ., Hatyai, Thailand

Objective: As the incidence of hip fractures rises among the elderly, hip replacement with a cemented femoral stem becomes a viable treatment option. However, concerns about potential complications, particularly Bone Cement Implantation Syndrome (BCIS), especially in patients with medical conditions, have prompted orthopedic surgeons to explore alternative approaches. This retrospective study compared BCIS incidence in patients with and without preexisting heart disease undergoing cemented bipolar hemiarthroplasty.
Methods: Retrospective data from 311 patients undergoing cemented bipolar hemiarthroplasty were analyzed, involving 188 individuals without preexisting heart disease and 123 with heart disease. Anesthetic records were reviewed to assess parameters related to BCIS. The severity of BCIS was systematically graded, emphasizing key metrics like hypotension, arterial desaturation, or loss of consciousness.
Results: No perioperative deaths occurred. BCIS grade 1 manifested in 13 cases (4.18% of the total patients), with no instances of grade 2 or 3. Notably, grade 1 BCIS was observed in only 2 cases with preexisting heart disease (1.63%). In the control group without preexisting heart disease, 11 cases demonstrated grade 1 BCIS (5.85%).
Conclusion: The incidence of BCIS in cemented bipolar hemiarthroplasty was minimal, with predominantly low severity. Importantly, preexisting heart disease did not demonstrate a significant increase in the risk of BCIS. This affirms the safety of cemented bipolar hemiarthroplasty for elderly patients.

P1326
FINITE ELEMENT MODEL OF SCREWS FOR CEMENT AUGMENTATION IN TOTAL KNEE ARTHROPLASTY WITH TIBIAL UNCONTAINED BONE DEFECT

V. Yuenyongviwat[1], A. Kwanyuang[2]

[1]Dept. of Orthopedics, Faculty of Medicine, Prince of Songkla Univ., [2]Institute of Biomedical Engineering, Faculty of Medicine, Prince of Songkla Univ., Songkhla Hatyai, Thailand

Objective: Addressing challenges in the management of medial uncontained tibial defects is crucial for the success of total knee arthroplasty (TKA), as these issues impact prosthesis stability and implant survival. While the utilization of screws and bone cement is a preferred approach, the literature lacks consensus on optimal screw insertion techniques. This study aims to fill this gap by investigating the biomechanical implications of different screw and cement placement strategies.
Methods: A finite element analysis was conducted using a knee prosthesis model featuring a defined uncontained tibial defect. Various parameters were systematically adjusted, including the number of screws (1, 2, 3 screws), screw lengths (10, 18, 30, 40 mm), lateral-medial screw positions (2, 4, 6 mm laterally), and abduction rotation angles (0, 5, 10, 15°). These adjustments were made to assess their individual and combined effects on the vertical displacement and abduction angles of the tibial tray.
Results: The inclusion of three-screw reinforcement significantly decreased vertical displacement, with the single screw in the middle position demonstrating superior performance in preventing abduction angle deformation compared to scenarios involving two screws at anterior and posterior positions without a middle screw. Longer screws and smaller abduction angles contributed to reduced movement of the tibial component. Additionally, lateral adjustment of the screw position led to increased vertical displacement values, reaching approximately 1.5% when shifted 6 mm laterally.
Conclusion: The finite element analysis suggests that, for addressing medial uncontained tibial defects, three-screw reinforcement is advantageous for larger defects. Longer screws and a smaller abduction angle are considered favorable. Furthermore, the study emphasizes the superiority of medial screw placement over lateral placement. It is crucial to highlight that further clinical validation is necessary to confirm the biomechanical implications observed in this study.

P1327
PREVALENCE AND ASSOCIATED RISK FACTORS OF OSTEOPOROSIS IN NURSING HOME RESIDENT: A CROSS-SECTIONAL STUDY

W. C. Lin[1], C.-T. Li[2], C.-C. Li[2], C.-H. Wu[3], T.-W. Tai[4]

[1]Dept. of orthopedics, Show Chwan Memorial Hospital, Changhua, [2]Institute of Gerontology, Collage of medicine, National Cheng Kung Univ., Tainan, [3]Institute of Gerontology, College of medicine, National Cheng Kung Univ., Tainan, [4]Dept. of orthopedics, National Cheng Kung Univ. Hospital, National Cheng Kung Univ., Tainan, Taiwan

Objective: To investigate the prevalence of undiagnosed osteoporosis in a nursing home, surpassing initial expectations.
Methods: A comprehensive assessment of osteoporosis prevalence utilized DXA, FRAX calculations, a structured questionnaire, and blood screening correlation, incorporating data from 57 residents at a nursing home. Additionally, osteoporosis severity in nursing home residents, matched for sex, age, and fracture history, was compared via DXA with 114 patients from a medical center.
Results: The study revealed an osteoporosis prevalence of 86.5%, with rates of 90.3% in women and 81.0% in men. Identified risk factors included female gender and low vitamin D levels. Fracture history, and TL-spine X-ray lateral view showed the potential as a preliminary screening tool for osteoporosis in nursing home settings.
Conclusion: Nursing home residents represent a unique population with a notably high osteoporosis prevalence, even when compared with counterparts in medical centers employing similar fracture characteristics. The findings serve as a valuable reference for evaluating and diagnosing osteoporosis among nursing home residents, offering a foundation for future research endeavors in this domain.

P1328
CHINESE MEDICINE ENHANCES BONE MARROW DENSITY IN OSTEOPOROSIS PATIENTS: A 12-YEAR REAL-WORLD SINGLE-CENTER STUDY IN TAIWAN

W. L. Chen[1], Y. L. Deng[1], C. Y. Hsu[1]

[1]Taichung Veterans General Hospital, Taichung, Taiwan

Objective: Osteoporosis constitutes a significant health concern, impacting human well-being. In Taiwan, many patients turn to traditional Chinese medicine (TCM) as an alternative medical treatment. However, there is currently limited data on the effectiveness of TCM in osteoporosis. This study aims to investigate the impact of TCM on bone marrow density (BMD).
Methods: Based on research utilizing the Taiwan Health Insurance Database previously, this study identified five commonly used TCM for osteoporosis patients. These include three single-herb medicines: Eucommia ulmoides, Dipsaci Radix, and Drynariae Rhizoma, as well as two formulas: Bawei Dihuang Pills and Guilu Erxian Guo. The cumulative dose criteria were set at 12 g or more for single-herb medicines and 80 g or more for formulas. A retrospective data analysis was conducted using the osteoporosis database from Taichung Veterans General Hospital, Taiwan. Patients concurrently using anti-osteoporosis medication were grouped and subjected to analysis.
Results: This study enrolled a total of 162 patients with BMD data both pre and post-taking TCM recorded between 2010–2022. The results indicated significant differences in BMD_FEMUR_LT(0.78 vs. 0.81, $P < 0.001$) and BMD_FEMUR_RT (0.78 vs. 0.79, $P = 0.001$) before and after TCM usage. However, no significant difference was observed in BMD_FEMUR among those who used TCM in conjunction with anti-osteoporosis medication. Possible explanation include that individuals combining Chinese and western medicine had lower BMD pre-treatment (0.67), indicating a more severe condition, thereby resulting in less pronounced improvements post-treatment. Additionally, significant differences were observed in TSCORE_FEMUR_LT(-1.68 vs. -1.18, $P < 0.001$), TSCORE_FEMUR_RT(-1.71 vs. -1.31, $P < 0.001$), and TSCORE_SPINE (-0.97 vs. -0.5, $P < 0.001$)after TCM usage. Combining TCM with anti-osteoporosis medication also demonstrated a significant difference in TSCORE_FEMUR_RT(-2.49 vs. -2.24, $P < 0.001$).
Conclusion: TCM can serve as a viable option among selective medications for osteoporosis patients. However, to better ascertain its effectiveness and safety, it is imperative to conduct more extensive large-scale research in the future.

P1329
PSORALEN MEDIATES WNT/BMP SIGNALING PATHWAY TO REGULATE BMSCS OSTEOGENIC DIFFERENTIATION

W. Li[1], F. Chen[2], M. Chen[3], Y. Zhong[1], F. Yang[1]

[1]Shaanxi Univ. of Chinese Medicine, Xianyang, China, [2]Baoji Hospital of Traditional Chinese Medicine, Baoji, China, [3]Hancheng Hospital of Traditional Chinese Medicine, Weinan, China

* Correspondence: yangfengdudu@163.com.

1 Shaanxi University of Chinese Medicine, Xi'an 712,046, China.

2 Affiliated Hospital of Shaanxi University of Chinese Medicine, Xi'an 712,083, China.

3 Baoji Hospital of Traditional Chinese Medicine, Baoji 721,001, China.

4 Hancheng Hospital of Traditional Chinese Medicine, Weinan 715,499, China.

Objective: To explore the mechanism of psoralen mediated Wnt/β-catenin and bone morphogenetic protein (BMP) signaling pathway to induce osteogenesis of BMSC.
Methods: Bone marrow mesenchymal stem cells (BMSCs) were treated with psoralen to detect its osteogenic differentiation. In addition, lentivirus and siRNA were used to construct cell models of β-catenin or BMP2 overexpression and knockdown, separately. They may help to clarify the role of β-catenin and BMP2 crosstalk in osteogenic differentiation of BMSCs. What's more, C57BL/6 mice were selected to be treated psoralen with psoralen to further verify the osteogenic effect.
Results: Various in vitro studies on BMSCs showed that psoralen could promote the osteogenic differentiation of BMSCs. Overexpression of β-catenin could promote the expression of BMP2 in BMSCs, and psoralen can enhance the effect of bone differentiation. Knockdown β-catenin decreased the expression of BMP2 and inhibited psoralen in promoting bone differentiation. In addition, it was found that the effect of psoralen on β-catenin level did not change significantly after overexpression or knockdown of BMP2, but the effect of psoralen on promoting bone differentiation was inhibited by knockdown of BMP2. In mice, psoralen intervention regulated the crosstalk of Wnt/β-catenin and BMP signaling pathway to reached to promote osteogenic differentiation of bone tissue.
Conclusion: Psoralen can activate β-catenin signaling pathway and upregulate the expression of BMP signaling pathway to increase the cross talk between β-catenin and BMP, to eventually reach to promote osteogenic differentiation of BMSCs.
Acknowledgements: This trial was funded by the Program of National Natural Science Foundation of China (81,973,889 to FY), the Program of Shaanxi Province Natural Science Foundation (2023-YBSF-210 to FY & 2023-JC-QN-0978 to WL), the Program of Shaanxi Education Department (19JC013 to FY & 22JK0346 to WL), the Program of Shaanxi Administration Bureau of Traditional Chinese Medicine (2021–01-22–009 to FY &2022-QCYZH-029 to WL), Youth Innovation Team in Shaanxi universities, and the Program of Health Commission of Shaanxi Province (2022B002 to WL).

P1330
EXPLORE MUSCULOSKELETAL CORRELATION IN PATIENTS WITH OSTEO-SARCOPENIA BY DXA

W. Li[1], Y. Zhong[1], F. Chen[2], F. Yang[1]

[1]Shaanxi Univ. of Chinese Medicine, Xianyang, China, [2]Baoji Hospital of Traditional Chinese Medicine, Baoji, China

Wenxiong Li[1,2], YuanZhong[1], Feifei Chen[3], Feng Yang[1,2*]

* Correspondence: yangfengdudu@163.com.

1 Shaanxi University of Chinese Medicine, Xi'an 712,046, China.

2 Affiliated Hospital of Shaanxi University of Chinese Medicine, Xi'an 712,083, China.

3 Baoji Hospital of Traditional Chinese Medicine, Baoji 721,001, China.

Objective: Sarcopenia (SP) and osteoporosis (OP) are two common chronic musculoskeletal diseases in the elderly population. With the aging of the global population, the prevalence of OP and SP increases year by year, which seriously increases the risk of falls, fractures and hospitalization of the elderly. The diseases seriously damage the quality of life and health of the elderly, and create a heavy burden for our medical system and society. Therefore, in 2009, Binkley et al. developed the concept of Osteo-sarcopenia (OS) based on the same pathophysiological basis for SP and OP and the same adverse effects on physical health in older adults. However, there is still no authoritative organization or guide to put forward unified OS diagnostic criteria. Most of them are based on the diagnostic criteria of SP and OP, and the diagnostic criteria of both SP and OP are taken as the

judgment criteria of OS. The study of the relationship between muscle and bone and the intervention and treatment of muscle loss and bone mass loss can more effectively reduce the disability rate and fatality rate of this disease and improve the quality of life of the elderly.

Methods: OS subjects were initially screened according to the SARC-CalF questionnaires and International Osteoporosis Foundation (IOF) one-minute osteoporosis risk test, and were selected according to the inclusion and exclusion criteria of OS. Muscle strength was measured using a grip strength meter, and physical function was measured by 5-time chair stand test, 6-min walk test, stair-climb power test, timed-up-and go test and the Short Physical Performance Battery (SPPB). Pain using visual analogue scale (VAS) score and Assessment of health related quality of life in osteoporosis (ECOS-16) were used to evaluate the function of patients with osteoporosis. DXA was used to detect appendicular skeletal muscle mass (ASM) and BMD of the lumbar spine (1–4) and hip to explore musculoskeletal correlations and possible patterns of interaction in OS.

Results: OS subjects were significantly lower than normal subjects in muscle strength,

5-time chair stand test, 6-min walk test, stair-climb power test, timed-up-and go test, SPPB and other physical function indicators. DXA results showed that the ASM and the BMD of the lumbar spine (1–4) and hip in OS subjects was significantly lower than the normal. The reduction of muscle mass and bone mass in lumbar and hip joints was synergistic to some extent.

Conclusion: DXA can noninvasively evaluate musculoskeletal structures and their dynamic changes in OS population at the microscopic level. Therefore, DXA can be used for noninvasive early examination of the aged, which may clarify the muscle and bone loss of them to facilitate early intervention and reduce the risk of osteoporosis fracture.

Acknowledgements: This work was sponsored by the Program of National Natural Science Foundation of China (81,973,889 to FY), the Program of Shaanxi Province Natural Science Foundation (2023-JC-QN-0978 to WL), the Program of Shaanxi Education Department (22JK0346 to WL), the Program of Shaanxi Administration Bureau of Traditional Chinese Medicine (2021–01-22–009 to FY &2022-QCYZH-029 to WL), Youth Innovation Team in Shaanxi universities, and the Program of Health Commission of Shaanxi Province (2022B002 to WL).

P1331
TRENDS OF VERTEBRAL HEIGHT LOSS IN NORMAL OLDER POPULATION

C.-H. Chan[1], Y.-C. Lu[2], H.-Y. Wu[3], W. P. Chan[4]

[1]Dept. of Geography, National Taiwan Normal Univ., Taipei, [2]National Center for Geriatrics and Welfare Research, National Health Research Institutes, Yunlin, [3]Dept. of Radiology, Wan Fang Hospital, Taipei Medical Univ., Taipei, [4]Dept. of Radiology, Wan Fang Hospital, Taipei Medical Univ., Dept. of Radiology, School of Medicine, College of Medicine, Taipei Medical Univ., Taipei, Taiwan

Objective: To use an automatic vertebral compression fracture (VCF) detection method to investigate the percentage of vertebral height loss of normal aging population and to determine the differences in sex, age, and vertebrate level. Specific objectives included (1) the occurrence of the most severe VCFs in each sex, vertebral level and age group; (2) the distribution of the percentage of vertebral height loss by vertebral level, age, sex; and (3) the range of percentage of vertebral height loss by normal aging population.

Methods: All non-contrast MDCT images of 856 participants (300 women) with an average age of 59.6 y (aged 50–95) were collected between 4 January 2021 and 31 March 2022. The MDCT images were reconstructed into 2.5 mm thick slices for automatic VCF analysis by SmartBone software. The subjects were divided into seven age groups, each of 5 y. We assessed differences in VCF between seven groups and two sexes using ANOVA and independent T tests. The normal range of the percentage of vertebral height loss with a combination of all vertebral levels during normal aging using the normal distribution estimation method (95%CI) and the interquartile range method (1.5 interquartile range).

Results: The results showed that the most severe VCF usually occurred at T7, T11, and T12 in men. However, women generally had the most severe VCF from T5 to T8 between the ages of 50–60, and in the latter, the most severe VCF concentrated in T8. In addition, the increasing trends in vertebral height loss percentages by vertebral level and age group in men and women, and the progress in vertebral height loss in women, was similar to those in men. The percentage of vertebral height loss in the normal range of all age groups of both sexes exceeded 25%, where men and women losing 33% of vertebral height between 70–80 y of age.

Table 1. The vertebral height loss percentage of normal aging population

Sex	Age	Mean†	SD	Mean±2SD	Median	Q1	Q3	Range‡
Men	50-60	17.562	5.210	7.143-27.981	16.913	14.525	19.707	6.751 - 27.480
	60-70	18.470	6.077	6.315-30.625	17.616	15.013	20.612	6.615 - 29.010
	70-80	21.726	10.050	1.625-41.827	19.411	16.310	23.982	4.802 - 35.491
	80-100	23.224	9.301	4.622-41.827	20.782	18.161	25.134	7.701 - 35.594
Women	50-60	16.520	4.341	7.839-25.202	16.283	13.776	19.138	5.734 - 27.180
	60-70	18.271	4.800	8.671-27.871	17.747	15.221	20.653	7.073 - 28.801
	70-80	20.039	7.756	4.528-35.550	18.614	15.665	22.232	5.815 - 32.083
	80-100	21.260	7.547	6.167-36.353	20.518	17.079	23.344	7.681 - 32.742

† Different superscripts in the same column indicate significant difference (P value <0.05).
‡ The range was determined by two-step: first, we calculated Q1 – 1.5×interquartile range and Q3 + 1.5×interquartile range as lower and upper bounds, respectively, where interquartile range was obtained from the differences between Q1 and Q3. Second, we calibrated the lower and upper bounds with the minimum and maximum values within the lower and upper bounds, respectively.

Conclusion: For the first time, our results show trends in reduction in vertebral height during normal aging in older Asians, thereby providing a reference database for clinical practice in the diagnosis and treatment of osteoporotic compression fractures.

P1332
ASSOCIATION OF OSTEOPOROSIS AND EFFECTIVENESS OF ANTI-OSTEOPOROSIS TREATMENT WITH HEARING IMPAIRMENT: A NATIONWIDE, MATCHED CASE–CONTROL STUDY

S.-H. Hung[1], J. C. Hsu[2], C. F. Huang[3], W. P. Chan[4]

[1]Dept. of Otolaryngology, School of Medicine, College of Medicine, Taipei Medical Univ., Dept. of Otolaryngology, Wan Fang Hospital, Taipei Medical Univ., Taiwan, [2]Health Data Analytics and Statistics Center, Office of Data Science, Taipei Medical Univ., International PhD Program in Biotech and Healthcare Management, College of Management, Taipei Medical Univ., Taipei, [3]Faculty of Medicine, School of Medicine, National Yang Ming Chiao Tung Univ., Division of Family Medicine, En Chu Kong Hospital, Taiwan, New Taipei City, [4]Dept. of Radiology, School of Medicine, College of Medicine, Taipei Medical Univ., Dept. of Radiology, Wan Fang Hospital, Taipei Medical Univ., Taiwan, Taipei, Taiwan

Objective: To (1) assess the risk of hearing loss associated with osteoporosis or fragility fractures, and (2) investigate the prevention of hearing loss by anti-osteoporosis treatment.

Methods: This is a retrospective cohort study. Between 2011–2017, participants over age 50 y were extracted from the Taiwan National Health Insurance Research Database (NHIRD). The experimental group 1 consists of patients with osteoporosis or fragility fractures who have not received any medical treatment. The experimental group 2 includes patients with osteoporosis or fragility fractures who

have been treated with long-term anti-osteoporosis medications (group 2a, zoledronic acid or group 2b, denosumab). Participants who had hearing loss before entry date, received anti-osteoporosis treatment before, cancer history, death within one year of the entry date, incomplete information were excluded. Group 3 is a control population with participants without osteoporosis or fragility fracture or anti-osteoporosis treatment. In this study, prevalence rates were calculated on the basis of age, sex and CCI score to conduct matching in order to obtain control groups for both research objectives. The study used hearing loss as a major outcome and multiple comorbidities as adjustment factors. Survival curves and log-ranking tests were used, and Cox proportional risk regressions were used to compare risk differences between the experimental groups and the control group. In addition, this study conducted subgroup analysis based on patient sex, age and various comorbidities.

Results: After matching by age, sex, and CCI scores, there were 25,642 participants in group 1, 25,642 in group 2a, 25,642 in group 2b, and 550,124 participants in group 3 (control). The risk of hearing loss is significantly higher in patients with osteoporosis or fractures than in non-osteoporosis patients (adjusted HR 1.36; 95% CI, 1.33–1.38). In patients with osteoporosis or fractures, users of zoledronic acid injection (adjusted HR 0.87; 95%CI 0.81–0.93) and denosumab (adjusted HR 0.91; 95%CI 0.85–0.97) indicated a significantly lower risk of hearing loss than patients without an anti-osteoporosis treatment.

Conclusion: This study used nationwide database to confirm that osteoporosis or fragility fractures are associated with increased risk of hearing loss. In addition, the results show that patients taking anti-osteoporosis medication can reduce the risk of hearing loss.

P1333
DEEP LEARNING-ASSISTED QUANTITATIVE MEASUREMENT OF THORACOLUMBAR FRACTURE FEATURES ON LATERAL RADIOGRAPHS ACROSS DIVERSE CLINICAL EXPERTISE

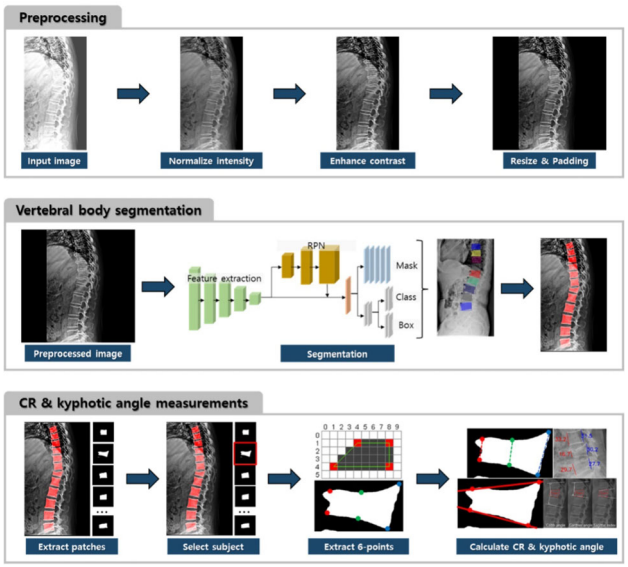
W. T. Yuh[1], K. D. An[1]

[1]Hallym Univ. College of Medicine/Neurosurgery, Dongtan Sacred Hospital, Hwaseong-Si, South Korea

Objective: To develop and validate a deep learning (DL) algorithm for the quantitative measurement of thoracolumbar (TL) fracture features, and to evaluate its efficacy across varying levels of clinical expertise.

Methods: Utilizing the Mask Region-Based Convolutional Neural Networks (Mask R-CNN) model, a DL algorithm was developed to quantify TL fracture features—compression rate (CR), Cobb angle (CA), Gardner angle (GA), and sagittal index (SI)—from lumbar spine lateral radiographs. A dataset of 1000 non-fractured and 318 fractured images was used for training, employing a 6-point labeling method. Validation involved 213 internal and 200 external fractured images. The measurements by an experienced radiologist were considered ground truth (GT) and assessed using the intraclass correlation coefficient. Additionally, we evaluated the agreement between the measurements of the GT and those of four readers, both with and without the assistance of the DL algorithm. The expertise of the four readers varied, including radiology and neurosurgery trainees, as well as an attending spine surgeon.

Results: The DL algorithm demonstrated good to excellent agreement with GT for CR, CA, GA, and SI in both internal (0.860, 0.944, 0.932, and 0.779, respectively) and external validations (0.836, 0.940, 0.916, and 0.815, respectively). DL-assisted measurement significantly improved most measurement values, particularly for trainees.



Conclusion: This study validated the DL algorithm as an accurate and effective tool for quantifying TL fracture features using radiographs. Implementing DL-assisted measurement is expected to expedite the diagnostic process and enhance the reliability of diagnoses, especially for trainees.

P1334
ASSESSMENT OF PATIENTS' BELIEFS REGARDING OSTEOARTHRITIS TREATMENT

A. Fazaa[1], W. Tekaya[1], S. Miladi[1], H. Boussaa[1], Y. Makhlouf[1], K. Ben Abdelghani[1], A. Laatar[1]

[1]Rheumatology Dept. of Mongi Slim Hospital, Tunis, Tunisia

Objective: To assess patients' beliefs regarding osteoarthritis (OA) medications and to investigate the factors influencing these beliefs.

Methods: We conducted a cross-sectional study including patients with OA (ACR criteria). Socio-demographic and disease-related data were collected. Beliefs about OA medications were evaluated using the Beliefs about Medicines Questionnaire-Specific (BMQ-S), presented in the form of two scores ranging from 5–25 and expressed as a necessity-concerns differential (NCD) ranging from -20 to + 20. Factors associated with BMQ-S variance were investigated. The significant level was $p < 0.05$.

Results: We included 36 patients, 7 men and 29 female, with a mean age of 62 y [32–82]. Among them, 30.6% were illiterate and 55.6% were homemakers. Comorbidities were present in 58.3% of cases. The majority of patients (72.2%) exhibited OA manifestations in more than one anatomical site, with knee OA (77.8%) being the most prevalent. The mean disease duration was 7.7 years [1–20]. Average visual analog scale (VAS) score was 47.2 mm [10–70]. During the latest consultation, 97.2% of patients received at least two types of treatments: first-tier analgesics (100%), topicals (83.3%), NSAIDs (69.4%), disease modifying osteoarthritis drugs (22,2%), second-tier analgesics (8.3%) and corticosteroid infiltrations (22.2%). Concerning beliefs, 69.4% of patients scored above 15 on the BMQ-S necessity subscale, with a mean score of 16.7 [10–22]. For BMQ-S concerns, the average score was 15.6 [9–23]. Side effects (69.4%) and dependence on treatment (50%) were the main concerns. The mean NCD was 1.1 [-11–10]. There was a significant negative association between educational level and BMQ-S necessity ($p = 0.02$). No statistically significant associations were observed between BMQ-S

necessity and VAS, comorbidity, disease duration, number of degenerative joint sites and number of prescribed medications. Similarly, no significant associations were found between NCD and the number of prescribed treatments, educational level and gender.

Conclusion: Our findings reveal a nuanced perspective among OA patients, characterized by a predominant conviction in the necessity of medications for health maintenance, juxtaposed with concerns about potential risks, particularly regarding side effects and treatment dependence. Understanding these nuanced insights is essential for tailoring patient-centered care in the effective management of OA.

P1335
EFZIMFOTASE ALFA IMPROVES SKELETAL MUSCLE SPARE RESPIRATORY CAPACITY IN A MOUSE MODEL OF HYPOPHOSPHATASIA

D. Devore[1], J. Ruanova[1], D. Dunn[1], W. Voegtli[1], M. Tarnopolsky[2], A. Petryk[1]

[1]Alexion, AstraZeneca Rare Disease, Boston, USA, [2]McMaster Institute for Research on Aging, Hamilton, ON, Canada

Objective: Hypophosphatasia (HPP) is a rare inborn error of metabolism caused by deficient alkaline phosphatase (ALP) enzyme activity and characterized by musculoskeletal manifestations, including muscle weakness. The mechanism underlying muscle weakness is poorly understood. We hypothesized that mitochondrial dysfunction contributes to muscle weakness independent of impaired bone mineralization in HPP and that the investigational ALP enzyme replacement therapy (ERT) efzimfotase alfa improves mitochondrial bioenergetics in a mouse model of HPP.

Methods: Skeletal muscle fiber bundles were isolated from age- and sex-matched wildtype and Akp2GW$^{-/-}$ mice (a model of HPP) treated with 2 mg/kg efzimfotase alfa or vehicle (phosphate buffer saline) subcutaneously every other day from postnatal day 3 to end of study (days 19–31). Oxygen consumption rate was analyzed in isolated muscle fiber bundles via Seahorse mitochondrial stress test and used to determine spare respiratory capacity (SRC). Bone mineralization was evaluated by x-ray in hind paw, femur, and tibia.

Results: SRC was reduced by 70% in vehicle-treated Akp2GW$^{-/-}$ mice compared with wildtype mice independent of bone mineralization. Efzimfotase alfa treatment significantly improved SRC in muscle fiber bundles of Akp2GW$^{-/-}$ mice to 107% of that of wildtype mice, a 257% increase relative to SRC in vehicle-treated Akp2GW$^{-/-}$ mice ($P = 0.0008$). The SRC improvement was similar in mice with and without radiographic evidence of impaired bone mineralization.

Conclusion: Efzimfotase alfa improved skeletal muscle SRC independent of bone mineralization in a mouse model of HPP. These data suggest potential benefits of treating muscle weakness in patients with HPP and warrant investigation of mechanisms of SRC impairment and benefits of ERT in HPP.

Acknowledgments: Study was sponsored by Alexion, AstraZeneca Rare Disease, Boston, MA, USA. Writing and editorial assistance were provided by Peloton Advantage, LLC, an OPEN Health company, and funded by Alexion, AstraZeneca Rare Disease.

Disclosures:

DD, JR, DD, WV, and AP are employees of and may own stock/options in Alexion, AstraZeneca Rare Disease. MT is the President and CEO of Exerkine Corporation; the company has no patents or products in the HPP area.

P1336
IDENTIFICATION OF HUB GENES AND KEY PATHWAYS IN SARCOPENIA THROUGH BIOINFORMATICS ANALYSIS

W. W. Gui[1], C. P. Zhou[1], X. H. Lin[1]

[1]Dept. of Endocrinology and Metabolism, Sir Run Run Shaw Hospital, College of Medicine, Zhejiang Univ., Hangzhou, China

Objective: To identify hub genes and key pathways in sarcopenia through bioinformatics analysis of gene expression microarray data, which may explore new therapeutic targets for the treatment of sarcopenia.

Methods: Gene expression microarray data (GSE8479) related to sarcopenia were downloaded from the Gene Expression Omnibus (GEO) database. Differentially expressed analysis and weighted gene co-expression network analysis (WGCNA) were used to explore sarcopenia-related modules and hub genes. GO and KEGG pathway enrichment analysis were performed to explore the potential role of hub genes. Then the STRING online tool was utilized to create a protein–protein interaction (PPI) network, and the maximum clique centrality (MCC) method was employed to assess the hub genes within the interaction network. Additionally, a clinical prediction model was constructed. Finally, gene expression validation was performed using a sarcopenia mouse model.

Results: A total of 218 differentially expressed genes were identified, with 139 genes upregulated and 79 genes downregulated in sarcopenia. WGCNA analysis revealed that the blue module was most correlated with sarcopenia phenotype. GO enrichment analysis indicated that these intersection genes were mainly involved in biological processes such as "cellular respiration," "energy metabolism," and "enzyme activity." Additionally, KEGG enrichment analysis revealed their close association with signaling pathways related to "fatty acid metabolism" and "ATP metabolism." PKM, LDHA, TPI1, CYCS, and CDKN1A were identified to be hub genes in the network using PPI network and MCC analysis. After that, clinical models were constructed and was verified effective using ROC curves. A sarcopenia mouse model was successfully established, and qRT-PCR confirmed the increased expression of CDKN1A and decreased expression of TPI1 in the mouse model of sarcopenia.

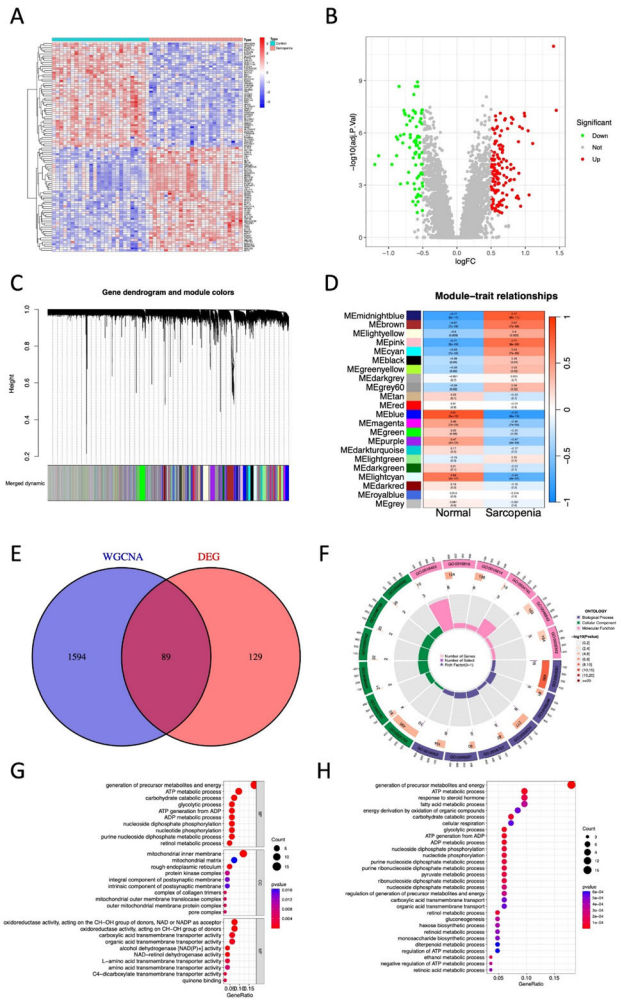


Figure 1. Genes differentially expressed between the sarcopenia and normal groups. (A) Heat map for differential expression analysis of GSE8479. (B) Volcanic map for differential expression analysis of GSE8479. Green represents downregulated genes, red represents upregulated genes, and black represents undifferentiated genes. (C) Dendrogram of all genes in the GSE8479 dataset was clustered on the basis of a topological overlap matrix (1-TOM). Each branch in the clustering represents a gene, while co-expression modules were constructed in different colors. (D) Module-trait heatmap of the correlation between the clustering gene module and sarcopenia in the GSE8479. (E) Venn diagram displayed 89 overlapping potential hub genes. (F) Circlize plot representing the GO analysis of differentially expressed genes. (G) GO enrichment analysis of hub genes. (H) KEGG pathway analysis of hub genes.

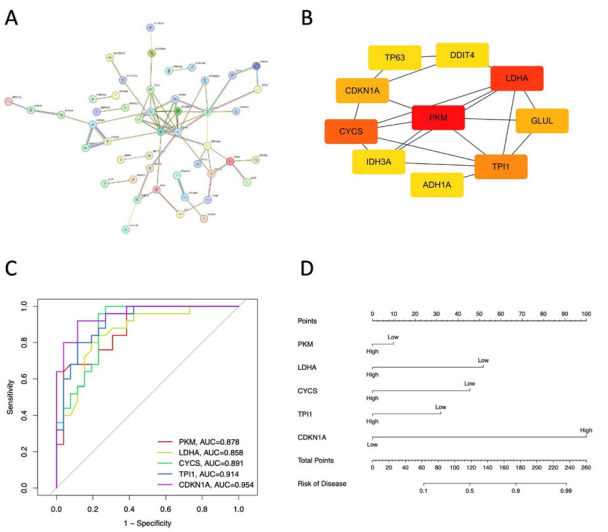


Figure 2. The construction of PPI network and clinical prediction model. (A) PPI network of hub genes. (B) The hub genes of the interaction network were obtained by MCC. (C) Nomogram model of hub genes. (D) ROC curves to assess the diagnostic efficacy of nomogram model and each hub gene.

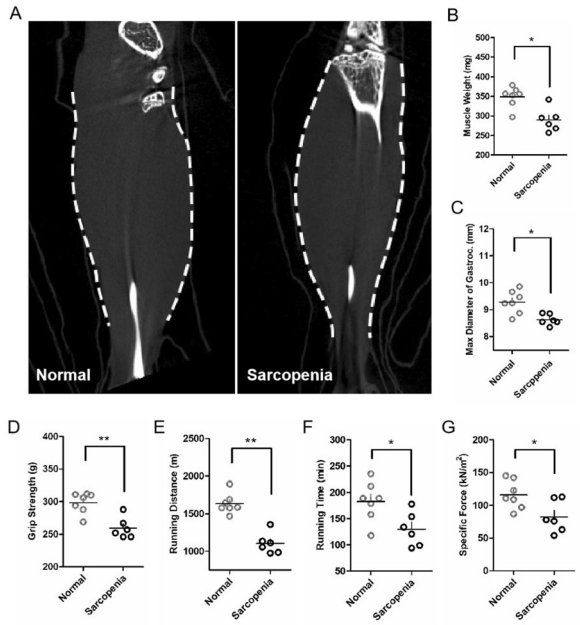


Figure 3. Phenotype identification of sarcopenia in aging mice. (A) μCT scanning of maximum diameter in the gastrocnemius muscle in aging mice and control young mice. (B) Average muscle weight between normal and sarcopenia mice. (C) Statistical analysis of diameter in the gastrocnemius muscle between normal and sarcopenia mice. (D) Statistical analysis of grip strength in sarcopenia mice compared to controls. (E) Treadmill test measuring average running distance in sarcopenia mice compared to controls. (F) Treadmill test measuring average running time in sarcopenia mice compared to controls. (G) Statistical analysis of gastrocnemius muscle contraction force in sarcopenia mice compared to controls using EMG.

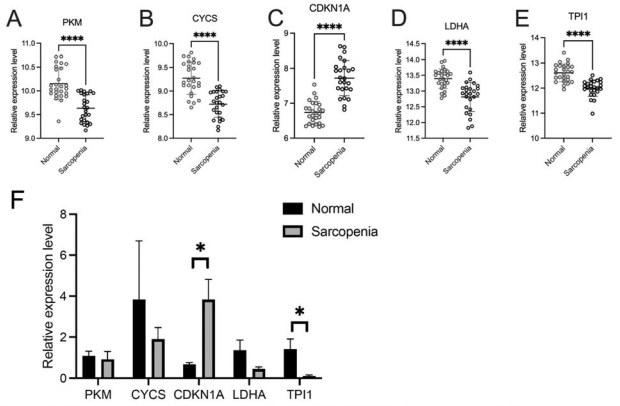


Figure 4. The expression of hub genes in GSE8479 and sarcopenia mouse model.

Conclusion: Through bioinformatics analysis of the GSE8479 dataset, it was revealed that the hub genes between sarcopenia and normal controls were mainly enriched in mitochondrial functional signaling pathways such as energy metabolism. A clinical prediction model was constructed using network hub genes, which may provide new therapeutic targets for sarcopenia.

P1337
ELEVATING OSTEOPOROSIS EDUCATION THROUGH MICROFILM-ENHANCED CASE-BASED LEARNING

W. Wei-Hsun[1]

[1]Changhua Christian Children's Hospital, Orthopaedic Dept., Changhua, Taiwan

Osteoporosis education plays a critical role in equipping healthcare professionals with the knowledge and skills necessary for effective patient care and management. Traditional didactic methods have limitations in engaging learners and preparing them for the intricacies of clinical practice. This abstract explores the transformative potential of microfilm technology in enhancing case-based learning within the context of osteoporosis education.

Microfilms offer an innovative approach to learning, blending visual storytelling with real-world scenarios to create an immersive and interactive educational experience. Through this technology, learners can engage with authentic patient cases, simulating clinical encounters that challenge their diagnostic and treatment decision-making abilities. The abstract examines the principles and methodologies for integrating microfilms into osteoporosis education and emphasizes the benefits that stem from this approach.

The use of microfilms in osteoporosis education not only deepens learners' understanding of the condition but also cultivates critical thinking and problem-solving skills essential in clinical practice. Moreover, it encourages active participation and collaborative learning, fostering a sense of teamwork and shared responsibility among healthcare professionals.

However, successful implementation of microfilms in osteoporosis education also raises questions and potential challenges, including the need for accessible technology, copyright considerations, and the development of engaging microfilm content. This abstract critically evaluates these aspects, shedding light on the strategies that can mitigate these challenges.

In conclusion, the incorporation of microfilms in osteoporosis education is a promising and dynamic approach that holds the potential to revolutionize the way healthcare professionals are trained in this field. By bridging the gap between theoretical knowledge and practical application, microfilm-enhanced case-based learning emerges as a powerful tool for fostering competency and excellence in osteoporosis management, ultimately leading to improved patient outcomes and quality of care.

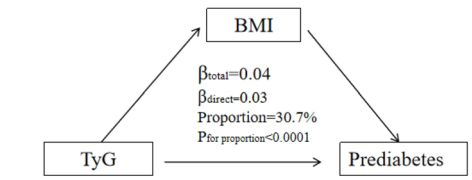
P1338
TRIGLYCERIDE-GLUCOSE INDEX, BODY MASS INDEX AND PREDIABETES: A SECOND ANALYSIS OF A POPULATION-BASED STUDY

W. Zhangxin[1]

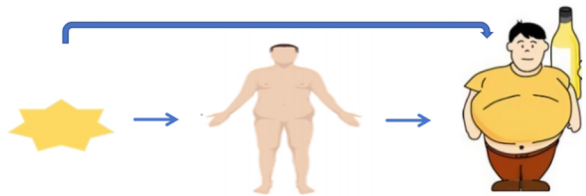
[1]Zhuzhou Hospital of Xiangya School of Medicine, Hunan, China

Objective: The triglyceride-glucose (TyG) index is a predictor of diabetes; however, Evidence and to what extent the TyG index is associated with prediabetes (Pre-DM) through BMI is unclear. Therefore, this study aimed to explore the complex association of the TyG index and BMI with Pre-DM using a cohort design.

Methods: This study was a cross-sectional study that enrolled 100,069 Chinese adults in a Chinese hospital from January 2010 to December 2014. Logistic regression model, generalized additive model (GAM), smooth curve fitting and a series of sensitivity analyses was used to evaluate the association between TyG index and Pre-DM. In order to determine whether BMI mediated the association between TyG index and Pre-DM, a mediation analysis was performed.



Mediation effect of BMI between TyG index and prediabetes



Results: During a maximum follow-up of 6.0 y, The prevalence of Pre-DM was 12.3%. After adjusting covariates, the results showed that TyG index was positively associated with Pre-DM ((OR = 2.1, 95%CI 2.0–2.1). In addition, the TyG index level has a non-linear relationship with the incidence of Pre-DM. And the sensitive analysis demonstrated the robustness of the results. Subgroup analysis showed a stronger association between TyG index and Pre-DM in females and the population with age $\leq$ 60 y, BMI $\leq$ 24 kg/m^2. Both the TyG index and BMI level were significantly associated with Pre-DM, BMI significantly mediated 30.7% of the associations between the TyG index and Pre-DM.

Conclusion: This study demonstrates a positive and non-linear relationship between TyG index and Pre-DM in Chinese people. The combination of a higher TyG index and higher BMI was associated with the highest risk of prediabetes. BMI could mediate the association between the TyG index and Pre-DM.

P1339
ENHANCING OSTEOPOROSIS CARE IN RURAL SETTINGS: A COMPREHENSIVE INTERVENTION APPROACH AND ITS IMPACT ON TREATMENT RATES

W.-J. Lai[1], S.-H. Fu[2], C.-Y. Wang[3]

[1]School of Medicine, China Medical Univ., Taichung, Taiwan, [2]Dept. of Orthopedics, National Taiwan Univ. Hospital Yun-Lin Branch, Douliu, Taiwan, [3]National Center for Geriatrics and Welfare Research, National Health Research Institutes, Douliu, Taiwan

Objective: To evaluate the impact of a comprehensive intervention on enhancing both the hospital arrival and treatment rate of anti-osteoporosis medication (AOM) within a rural community.
Methods: In this randomized controlled trial, 567 patients were allocated to three groups: Comprehensive Care (CC), Osteoporosis Care Only (OC), and Delayed Care (DC). The CC and OC groups received five interventions, encompassing professional and specialist support, increasing disease awareness, transportation assistance, peer support, and case management; the DC group received only the first two interventions.
Results: In the CC group, 73.3% (85 individuals) of the 116 participants recommended for hospital treatment successfully arrived, with 58.6% (68 individuals) receiving AOM. Conversely, in the DC group, only 4.1% (6 individuals) out of 146 recommended for hospitalization reached the hospital and received AOM after screening. Significantly divergent proportions were observed between the CC and DC groups concerning hospital arrival ($P < 0.001$) and AOM receipt ($P < 0.01$). Similar significant outcomes were noted in the OC group in comparison with DC group. In the OC group, 81% (124 individuals) of the 153 recommended for hospitalization arrived after intervention, and 69.3% (106 individuals) received AOM. The results were also significant when compared to the DC group ($P < 0.001$, $P < 0.001$, respectively).
Conclusion: The findings underscore the imperative for a comprehensive intervention to enhance osteoporosis treatment rates in rural regions. The notable increase in hospital arrival and treatment rates observed in both the CC and OC groups contrast with those in the DC group. These results emphasize the significance of incorporating healthcare professionals and specialists, increasing disease awareness, and offering supportive measures to facilitate rural patients in accessing healthcare services.

P1340
SUBSEQUENT FRACTURES IN POSTMENOPAUSAL WOMEN WITH FRAGILITY FRACTURES: INCIDENCE AND PATIENT CHARACTERISTICS FROM SIX EUROPEAN COUNTRIES

X. Chen[1], T. Rathod-Mistry[1], G. Fabiano[1], A. Moayyeri[2], J. Warden[2], C. Reyes[3], J. Brash[4], K. Verhamme[5], M. Mosseveld[5], S. Seager[4], R. Pinedo-Villanueva[1], E. H. Tan[1]

[1]Nuffield Dept. of Orthopaedics, Rheumatology and Musculoskeletal Sciences, Univ. of Oxford, Oxford, UK, [2]UCB Pharma, Slough, UK, [3]Fundació Institut Universitari per a la recerca a l'Atenció Primària de Salut Jordi Gol i Gurina, Barcelona, Spain, [4]IQVIA, London, UK, [5]Erasmus Univ. Medical Center, Rotterdam, Netherlands

Objective: To report the 2-y incidence of subsequent fracture in, and patient characteristics of, postmenopausal women with fragility fractures, using real-world data from six European countries.
Methods: A retrospective observational network cohort study was conducted using primary care databases from the UK (UK; CPRD), Germany (IQVIA DA), the Netherlands (IPCI), France (LPD), Italy (LPD) and Spain (SIDIAP). Databases were mapped to the OMOP Common Data Model. Women aged ≥ 50 y with an index fracture between April 2010 to April 2018 and ≥ 730 d observation period prior to the index fracture were eligible; women with a fracture < 730 d before index fracture were excluded. Incidence rate (IR) of subsequent fracture in the two years after index and cumulative incidence at the same and different fracture sites were estimated, accounting for death as competing risk. Patient characteristics were also recorded.
Results: Data were collected from 349,434 patients in total. IR varied between the six countries (IR per 1000 person-years [95%CI]; UK: 114.0 [111.7, 116.3], Spain: 142.0 [140.6, 143.4], the Netherlands: 164.2 [159.1, 169.5], Germany: 193.1 [190.9, 195.3], France: 202.2 [196.1, 208.5], Italy: 320.8 [314.6, 327.1]). Subsequent fractures most commonly occurred at the site of the index fracture. A higher proportion of patients with subsequent fracture than without had cardiovascular disease (CVD), rheumatoid arthritis, and use of medications including osteoporosis drugs, a trend generally seen across all countries excluding Spain (Table). In patients with a subsequent fracture, the proportion receiving osteoporosis medication at the index fracture date varied across countries (UK: 2.5%, the Netherlands: 2.9%, Spain: 5.8%, Germany: 13.2%, Italy: 13.7%, France: 15.9%).

Table. Patient characteristics of women aged ≥50 years with an index fracture with or without subsequent fracture in six European primary care databases

	UK (CPRD)		Germany (IQVIA DA)		Netherlands (IPCI)		France (LPD)		Italy (LPD)		Spain (SIDIAP)	
Group (n)	SF (9,271)	No SF (38,837)	SF (29,204)	No SF (72,382)	SF (3,863)	No SF (12,560)	SF (4,096)	No SF (10,823)	SF (10,202)	No SF (14,204)	SF (38,904)	No SF (105,088)
Age Group, %												
50–64 years	29.2	32.6	25.0	31.4	32.0	37.1	34.4	42.7	22.9	27.2	27.9	31.4
65–79 years	36.1	34.9	45.4	42.9	38.8	36.6	41.4	36.7	40.6	38.2	38.1	37.5
80–94 years	32.9	30.0	29.6	25.7	27.9	24.8	23.3	20.0	35.5	33.2	33.0	29.6
95+ years	1.9	2.4	0.0	0.0	1.2	1.4	0.9	0.6	1.1	1.4	1.1	1.5
Disease, %												
Cardiovascular disease	39.5	37.1	40.6	35.6	30.2	25.4	17.1	16.8	41.4	38.1	28.3	28.3
Heart failure	6.2	6.4	12.0	9.3	5.3	5.0	1.7	1.2	5.0	4.8	6.5	7.0
Myocardial infarction	3.6	3.9	1.8	1.5	2.2	2.1	0.8	0.7	1.3	1.3	1.3	1.2
Osteoporosis	27.0	21.6	45.6	34.8	14.1	9.3	38.8	19.3	40.0	37.7	15.3	16.6
Rheumatoid arthritis	4.7	4.1	7.2	5.9	3.8	2.9	2.2	1.3	2.5	2.3	1.1	1.4
Medication use, %												
Calcium channel blockers	22.1	20.8	13.1	10.6	14.9	14.5	11.4	11.2	21.2	18.7	14.4	13.7
Diuretics	26.2	24.9	17.0	13.0	24.6	21.8	10.9	10.3	37.4	35.7	25.1	24.7
Opioids	36.2	31.3	19.8	14.0	24.0	21.5	62.2	62.4	17.8	13.4	25.7	28.0
Osteoporosis drugs	2.5	1.7	13.2	7.1	2.9	3.0	15.9	7.2	13.7	9.4	5.8	6.9
Systemic corticosteroids	13.4	11.5	8.2	6.3	12.1	12.0	29.0	27.8	23.9	20.9	9.5	10.1

Patient characteristics for those with subsequent fractures are with reference to their first fracture date. Percentages of the mutually exclusive age groups may not add to 100% due to rounding. CPRD: Clinical Practice Research Datalink; DA: Disease-Analyser; IPCI: Integrated Primary Care Information; LPD: Longitudinal Patient Database; SIDIAP: Information System for Research in Primary Care.

Conclusion: There was considerable variation in IR of subsequent fracture between six large European countries, with IR being highest in Italy and lowest in the UK. Patients with subsequent fractures had higher rates of comorbidities and comedications. Identifying characteristics of these patients may prevent subsequent fracture and reduce the associated healthcare burden.
Acknowledgements: Funded by UCB Pharma and Amgen Inc. Medical writing services provided by Costello Medical.
Disclosures:
XC, TRM, GF, CR, JB, SS, EHT: Nothing to declare; AM: Employee and shareholder of UCB Pharma; JW: Employee of UCB Pharma; KV, MM: Research grants from Chiesi, the EMA and Johnson & Johnson; RPV: Research funding from Amgen, Fondation privée des HUG (Geneva, Switzerland), the International Osteoporosis Foundation, Kyowa Kirin Services, the Royal Osteoporosis Society and the UK NIHR. Lecture fees and/or consulting honoraria from Amgen, Astellas, the International Osteoporosis Foundation, Mereo Biopharma and UCB Pharma.

P1341
MUSCLE-SPECIFIC IGF2 KNOCKOUT INDUCE SARCOPENIA AND MUSCLE FUNCTIONAL DECLINE IN MICE

X. H. Lin[1], C. P. Zhou[1], G. L. Wang[2], W. W. Gui.[1]

[1]Dept. of Endocrinology and Metabolism, Sir Run Run Shaw Hospital, College of Medicine, Zhejiang Univ., [2]Dept. of

Orthopedics, Sir Run Run Shaw Hospital, College of Medicine, Zhejiang Univ., Hangzhou, China.

Objective: IGF2 is closely associated with the occurrence and development of primary and secondary muscle atrophy. This study investigates the role of IGF2 deficiency in inducing muscle atrophy using muscle-specific *Igf2* knockout mice, aiming to provide theoretical basis and new concepts for growth hormone supplementation therapy in muscle atrophy.

Methods: The expression profile of *Igf2* was analyzed using the Tabula Muris single-cell database. Muscle-specific *Igf2* knockout mouse models were constructed using the *Cre/LoxP* system and muscle-specific *Mck-cre* transgenic mice. Genotype identification and phenotype characterization were performed. The size and mass of the gastrocnemius muscle were observed through external morphology, dissection weighing, and HE staining. μCT scanning was conducted to assess muscle size, mass density, and maximum diameter. Electromyography (EMG) was used to measure gastrocnemius muscle contraction force, while the Md3000 animal grip strength meter was employed to evaluate grip strength. Treadmill tests were conducted to assess running endurance distance and time in both groups of mice. Finally, muscle tissue samples were subjected to transcriptome sequencing to observe the effects of *Igf2* deletion on downstream target genes, functional enrichment, and signaling pathways.

Results: The Tabula Muris single-cell database showed high expression of *Igf2* in limb muscle. We successfully constructed and identified muscle-specific *Igf2* knockout mice ($Mck^{+}Igf2^{fl/fl}$). μCT scanning and HE staining of the gastrocnemius muscle revealed a decrease in size, weight, density, maximum diameter, and average diameter in the knockout group compared to the control littermates. Electromyography measurements showed reduced gastrocnemius muscle contraction force in the $Mck^{+}Igf2^{fl/fl}$ group compared to the control group. Grip strength measurements using the Md3000 animal grip strength meter indicated weakened grip strength in the $Mck^{+}Igf2^{fl/fl}$ group. Treadmill tests demonstrated decreased running endurance distance and time in the $Mck^{+}Igf2^{fl/fl}$ mice. The results of transcriptome sequencing GO enrichment analysis showed that the functional differences in the two groups of mice were mainly enriched in muscle system process, RNA polymerase II transcription regulation, and the PI3K signaling pathway.

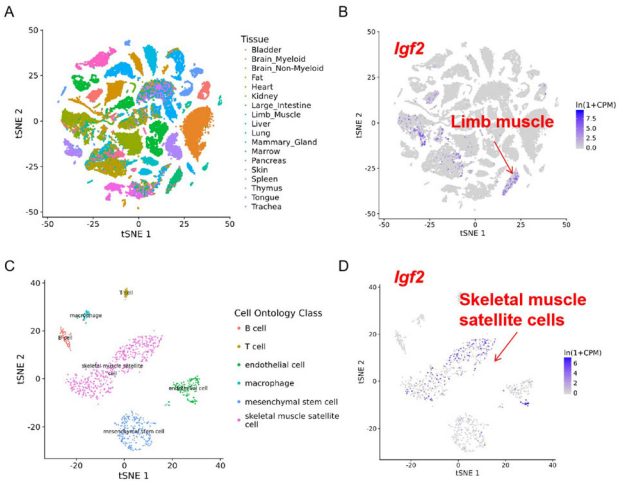


Figure 1. The results of Tabula Muris single-cell sequencing showed abundant expression of *Igf2* in skeletal muscle tissue. A. The tSNE visualization analysis of the first-level clustering of 20 organ single-cell transcriptome sequencing results from the Tabula Muris database. B. Distribution of *Igf2* in 20 organs. C. The tSNE visualization analysis of the second-level clustering of limb-muscle tissue samples. D. Enriched distribution of *Igf2* in the satellite cells of skeletal muscle subgroups.

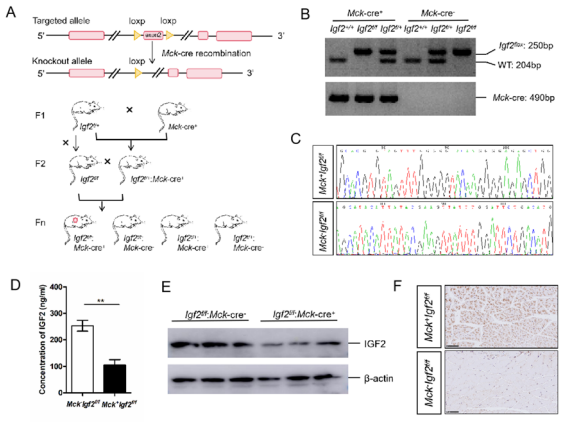


Figure 2. Mouse muscle-specific *Igf2* knockout strategy and identification. A. Schematic diagram of the construction of muscle-specific *Igf2* knockout mouse model ($Mck^{+}Igf2^{fl/fl}$). B. DNA genotype identification results of $Mck^{+}Igf2^{fl/fl}$ mice. C. DNA genotype identification gel electrophoresis sequencing results of $Mck^{+}Igf2^{fl/fl}$ mice. D. Determination of IGF2 concentration in skeletal muscle tissue of $Mck^{+}Igf2^{fl/fl}$ mice. E. Western blot analysis of IGF2 protein content in skeletal muscle tissue of $Mck^{+}Igf2^{fl/fl}$ mice. F. Immunofluorescence detection of IGF2 content in skeletal muscle of $Mck^{+}Igf2^{fl/fl}$ mice.

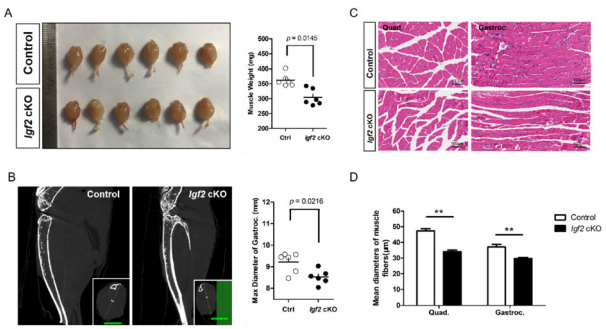


Figure 3. Phenotype identification of muscle atrophy in muscle-specific *Igf2* knockout mice. A. Overall appearance of gastrocnemius muscle in $Mck^{+}Igf2^{fl/fl}$ mice compared to control littermates. B. μCT scanning and statistical analysis of maximum diameter in the gastrocnemius muscle. C. Representative results of HE staining of gastrocnemius muscle and quadriceps muscle sections in $Mck^{+}Igf2^{fl/fl}$ mice and control mice. D. Statistical analysis of average diameter in the gastrocnemius muscle and quadriceps muscle of $Mck^{+}Igf2^{fl/fl}$ mice and control mice.

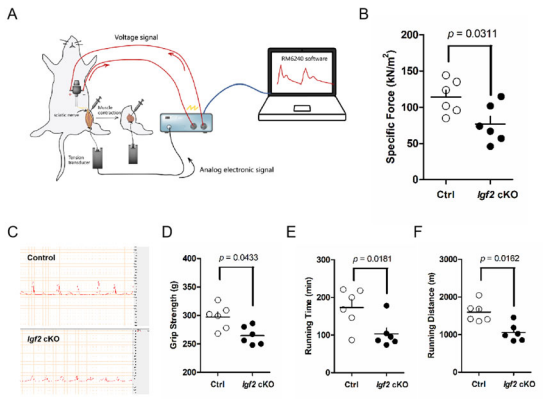


Figure 4. Functional identification of muscle in muscle-specific *Igf2* knockout mice. A. Schematic diagram of electromyography (EMG) measurement of gastrocnemius muscle contraction force. B. Statistical analysis of gastrocnemius muscle contraction force in $Mck^{+}Igf2^{fl/fl}$ mice compared to control littermates using EMG. C. Grip strength measurement using the Md3000 animal grip strength meter in both groups of mice. D. Statistical analysis of grip strength in $Mck^{+}Igf2^{fl/fl}$ mice compared to control littermates. E. Treadmill test measuring average running time in $Mck^{+}Igf2^{fl/fl}$ mice compared to control littermates. F. Treadmill test measuring average running distance in $Mck^{+}Igf2^{fl/fl}$ mice compared to control littermates.

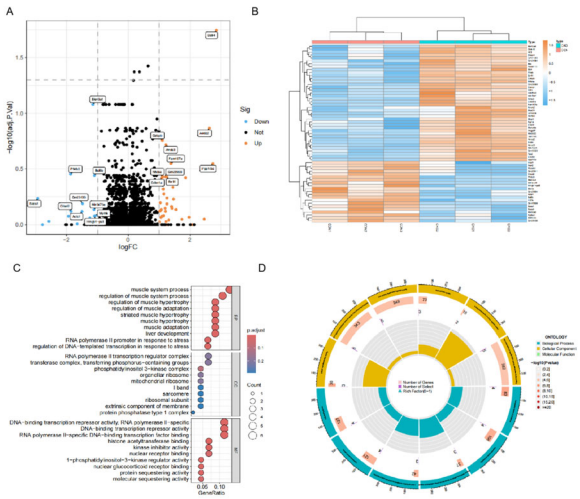


Figure 5. Transcriptome sequencing of skeletal muscle samples from muscle-specific *Igf2* knockout mice and control mice. A. Volcano plot showing the differentially expressed genes between the two groups of mice in the transcriptome sequencing. B. Heatmap displaying the top 50 differentially expressed genes identified in the transcriptome sequencing. C. Bubble plot illustrating the Gene Ontology (GO) functional enrichment analysis of differentially expressed genes. D. Circlize plot representing the GO analysis of differentially expressed genes.

Conclusion:*Igf2* is highly expressed in skeletal muscle tissue. Muscle-specific *Igf2* knockout mice exhibited reduced muscle size, weight, and density, weakened grip strength, decreased gastrocnemius muscle contraction force, and reduced running endurance distance and time. These findings suggest that IGF2 regulates muscle system processes through RNA polymerase II transcription and provide evidence that IGF2 supplementation may be a potential effective strategy for treating muscle atrophy.

P1342
RELATIONSHIP BETWEEN THE PRESENCE OF OSTEOPOROTIC FRACTURES AND SERUM ADIPONECTIN CONCENTRATION IN PATIENTS WITH RHEUMATOID ARTHRITIS

Y. Akhverdyan[1], B. Zavodovsky[1], E. Papichev[1], Y. Polyakova[1], L. Seewordova[1]

[1]Federal State Budgetary Institution «Research Institute of Clinical and Experimental Rheumatology named after A. B. Zborovsky», Volgograd, Russia

Objective: To study the possibility of predicting bone fractures in patients with rheumatoid arthritis (RA) and osteoporosis (OP) by determining the concentration of adiponectin (Ad) in the blood serum of patients.

Methods: We observed 109 patients diagnosed with RA, whose average age was 54.6 y [21.3–74.2], of which 93 (85.37%) were women and 16 (14.7%) men. According to the degree of RA activity, patients were distributed as follows: with activity 0 (DAS28 < 2.6)—19 people (17.43%), with low activity degree I (2.6 < DAS28 < 3.2)—26 people (23.85%), with an average degree of activity II (DAS28 ≥ 3.2—5.1)—57 people (52.29%), with a high degree of activity III (DAS28 > 5.1) there were 7 patients (6.42%). BMD assessment was performed using DXA.

Results: Depending on the presence of a diagnosis of OP, a group of patients with RA with AP (63 people) and a group of patients with RA without OP (46 patients) were identified. Patients were also divided into a group with a history of osteoporotic fractures (34 patients) and without fractures (75 patients). In patients with RA suffering from OP, the blood pressure level was significantly higher than in patients without OP (62.136 ± 24.541 and 35.672 ± 21.803 μg/ml, F = 12.46824, p = 0.00045). When comparing the Ad level of patients in the group with osteoporotic fractures (57.239 ± 31.932 μg/ml) with the group of patients without fractures (39.968 ± 23.279 μg/ml), a tendency towards an increase in Ad in patients with fractures was found, but it was not significant (p = 0. 0534). It was found that an increase in Ad concentration was associated with a decrease in CRP concentration (r =—0.2933, p = 0.0055) and an increase in ACCP (r = 0.3232, p = 0.0021).

Conclusion: In RA complicated by OP, an increase in the concentration of Ad is observed in the blood serum of patients. In the presence of pathological bone fractures in patients with RA, there is a tendency to increase blood serum blood pressure levels. There is a weak negative relationship between the concentration of Ad and CRP, and a weak positive relationship between Ad and ACCP.

P1343
MOBILITY OUTCOMES AFTER HOME- BASED AND INPATIENT REHABILITATION FOR LOWER LIMB FRACTURES IN A GERIATRIC POPULATION

Y. C. Ngui[1], G. M. Rajakaruna[1], C. Wickramasinghe[1], N. Andraweera[1]

[1]Dept. of Rehabilitation, Division of Aged Care, Rehabilitation, and Palliative Care, Modbury Hospital, Northern Adelaide Local Health Network, South Australia, Adelaide, Australia

Objective: Lower limb fractures remain a major public health concern in the geriatric population. We compared mobility outcomes after in-patient and home-based rehabilitation for lower limb fractures among geriatric patients.

Methods: Data from 81 patients admitted to Modbury Hospital home based rehabilitation services in South Australia were assessed. Falls risk scores and mini nutritional assessment scores were assessed on admission. Functional Independence Measure (FIM), de Morton Mobility Index (DEMMI) and Timed Up and Go (TUG) tests were performed on all patients at the time of admission and at discharge. Change in FIM, DEMMI and TUG scores between admission and discharge were calculated. The t-test was used to compare the mean differences between patients who had home based rehabilitation (n = 43) and those who had both inpatient and home-based rehabilitation (n = 43). Results were reported as mean ± SD (standard deviation). P value ≤ 0.05 was considered statistically significant.
Results: Of the 81 patients, 48 (59.2%) had fracture neck of femur. There were no significant differences between patients who underwent home based rehabilitation and those who underwent both inpatient and home-based rehabilitation in terms of age (80.3 ± 7.9 vs. 79.4 ± 8.7, p = 0.6), falls risk (3.3 ± 0.3 vs. 3.2 ± 0.4, p = 0.9) or mini nutritional assessment score (10.1 ± 0.7 vs. 10.1 ± 0.4, p = 0.9). There was no significant difference between patients who had home based rehabilitation compared to those who had both inpatient and home-based rehabilitation in change in FIM (6.8 ± 1.3 vs. 4.7 ± 2.3, p = 0.4), DEMMI (10.8 ± 2.2 vs. 9.8 ± 1.6, p = 0.7) or TUG scores (9.0 ± 4.3 vs. 7.5 ± 2.4, p = 0.7).
Conclusion: Older adults with lower limb fractures who received rehabilitation in the home had similar mobility outcome gains as those who received additional inpatient rehabilitation. Home-based rehabilitation alone may represent an effective alternative for treating older patients with lower limb fractures. Larger studies are required to validate these findings.

P1344
FALL RISK, FEAR OF FALLING AND FALL EFFICACY AFTER FRAGILITY HIP FRACTURE: WHAT SHOULD OCCUPATIONAL THERAPISTS PAY ATTENTION?

Y. Chan[1], C. Y. Chu[1], Y. K. Tan[1], S. T. Yip[1], N. F. Lui[1], K. L. Tiu[2], K. B. Lee[2], K. K. Li[2]

[1]Occupational Therapy Dept., Queen Elizabeth Hospital, [2]Dept. of Orthopedics & Traumatology, Queen Elizabeth Hospital, Hong Kong, Hong Kong SAR China

Objective: Fragility hip fracture (FHF), one of the common severe injuries of elderly after fall incident, is expected to increase under global ageing. Fear of falling (FoF) and actual falls are both strong predictors to FHF. Addressing fall risk and fall efficacy could be the strategies for secondary fall prevention through this lens. This study evaluates fall risk and fall efficacy among elderly with FoF following hip fracture.
Methods: Hip fracture patients, who aged 65 or above, attended Fragility Fracture Clinic between January 2018 to November 2023 were included in this retrospective study. The result of self-reported FoF was self-reported, by results all subjects were categorized into: Group A (with FoF) and Group B (without FoF). Fall risk and self-efficacy in daily activities for both two groups were measured by Fall Risk Assessment Test (FRAT) and Fall Efficacy Scale (FES), higher score means higher risk and better confidence respectively.
Results: 761 patients were included with mean age 82.4. Majority of patients (63.4%) had FoF. Total scores were categorized into three risk extents in FRAT: Low, Medium and High. 68.2% patients were classified in Low, 17.5% in Medium and 14.3% in High Risk. There was statistically significant difference in FRAT total score between two groups, which Group A had higher total score than B. Risk factors in FRAT: recent fall ($p < 0.01$), medication (p = 0.034) and psychological(p = 0.02), showed statistically significant differences between two groups, Group A scored higher than B. Patients with FoF might have higher fall tendency. Among the patients, 173 patients (76% with FoF; 23.8% without FoF) were assessed by FES. Mean FES score in Group A was 54.4 while Group B was 78.9. In Group A, 55.2% patients were classified as High Risk in FRAT with mean FES score 54.7. Group A might tend to have lower self confidence in fall prevention with higher actual fall risk than Group B. 12.7% patients reported no FoF with higher self-efficacy (FES mean score 77.7) was classified into High Risk, which indicated that they might not have clear perception towards their functional capacity.
Conclusion: Patients with FoF tended to have higher fall risk and lower self-efficacy. A proportion of elderly might have poor judgment in preventing falls. Education on self-management and fall prevention to elderly is paramount but challenging. Occupational therapists could address elderly's awareness to reduce fall incident.

P1345
DARIER ROUSSY DISEASE ASSOCIATED WITH OSTEOARTICULAR SARCOÏDOSIS: A CASE REPORT

S. Derbal[1], S. Agoubi[1], D. Chebbi[1], O. Hentati[1], F. Ben Dahmen[1], M. Abdallah[1], Y. Cherif[1]

[1]Univ. Tunis El Manar, Dept. of Internal Medicine, Regional Hospital of Ben Arous, Ben Arous, Tunisia

Sarcoidosis is a systemic granulomatous disease that usually affect the lungs and lymph nodes. Osteoarticular involvement which remains rare.
Case report: A 57-year-old patient with a medical history of mellitus diabetes consulted for painless swelling of the left stylus-radial joint and the first left phalanx since 6 months. The physical examination showed subcutaneous painless and mobile nodules on the posterior surface of the left forearm, consistent with the nodules of Darier Roussy. The joint, pleuropulmonary and ophthalmological examination was normal. The x-ray of the hand shows micro geodes and the joint ultrasound reveals bilateral synovitis without bone erosion. Chest CT scan reveals peri-lymphatic pulmonary micronodules with bilateral mediastinal and hilar adenomegaly and left axillary adenomegaly. The blood count, serum calcium, CRP and the rest of the assessment were normal except hypercalciuria at 8.12 mmol/24 h. Spirometry is normal and bronchoalveolar lavage showed lymphocytic fluid. The dosage of the converting enzyme was at 77 U/l. Pathological examination of the synovial biopsy of the left wrist revealed epithelioid and gigantocellular granulomas without caseous necrosis. The intradermal reaction to tuberculin was anergic with a negative search for BK in the sputum. The diagnosis of synovial and mediastino-pulmonary sarcoidosis with Darier Roussy disease is then made. The patient was treated with Plaquenil with disappearance of the subcutaneous nodules.
Conclusion: This case is interesting due to the presence of two rare manifestations of sarcoidosis: Darier Roussy nodules and asymmetrical synovial lesions. Pathological examination remains essential to make the diagnosis.

P1346
OSTEO-ARTICULAR TUBERCULOSIS IN ANTISYNTHETASE SYNDROME

S. Derbal[1], D. Chebbi[1], O. Hentati[1], Y. Cherif[1], F. Ben Dahmen[1], M. Abdallah[1]

[1]Univ. Tunis El Manar, Dept. of Internal Medicine, Regional Hospital of Ben Arous, Ben Arous, Tunisia

Rituximab (RTX) had already been effective in inflammatory myopathies with no response to conventional treatments, but it also induces depletion of B lymphocyte cells. This increases the risk of infection.
Case report: It's a 32-year-old patient with antisynthetase syndrome with muscular, pulmonary and false-route involvement and anti-JO1 antibodies. The patient was put on high-dose corticosteroids, immunoglobulin and an immunosuppressant. The patient's muscle damage remained resistant, and she was put on RTX after a pre-therapeutic workup including a negative interferon-y release test. The patient continued to have osteoarticular flare of the wrist and tenosynovitis of the hand, followed by arthritis of the ankles. Joint involvement was migratory and resistant to corticosteroids. She also described fluctuating fever. She was admitted with a right shoulder joint tumefaction. She had a biological inflammatory syndrome. The shoulder's MRI showed a fistulous subcutaneous collection in the subacromial bursa. Joint puncture revealed a purulent fluid with positive tuberculosis PCR. The patient underwent surgical treatment in association with anti-tuberculosis therapy. Anatomo-pathological study confirmed the presence of a gigantic cell granuloma with caseous necrosis.
Conclusion: Tuberculosis of the osteoarticular system is rare, and tendon involvement is exceptional. The contribution of the interferon-y release test is not always sensitive in this location.

P1347
CRYPTOCOCCUS INFECTION AND SARCOÏDOSIS: A CASE REPORT

S. Derbal[1], D. Chebbi[1], O. Hentati[1], Y. Cherif[1], F. Ben Dahmen[1], M. Abdallah[1]

[1]Univ. Tunis El Manar, Dept. of Internal Medicine, Regional Hospital of Ben Arous, Ben Arous, Tunisia

Cryptococcosis is a fungal infection caused by Cryptococcus neoformans or Cryptococcus gattii, involving patients with immunocompromising factors, such as human immunodeficiency virus, malignancies, transplantation and use of immunosuppressing drugs. Osteoarticuar involvement is uncommon but more frequent with sarcoïdosis. Patients with sarcoidosis are vulnerable to cryptococcosis even if they weren't on immunosuppressing treatment.
Case report: A 43-year-old woman how was flowed since 4 y for systemic sarcoïdosis with heart, pulmonary, lymph nodes and hematological involvement. She was on corticosteroid and methotrexate. The immunosuppressing drug was prescribed for a progressive and symptomatic interstitial lung disease. Eighteen months later, she had several cutaneous abscesses of the left lower limb. The histopathology exam and the fungal culture confirms a Cryptococcus Neoformans infections. She had topic treatment without clinical improvement. She was admitted for fever and painful subcutaneous lumber swelling. The tomography and the MRI confirm subcutaneous and paravertebral abscess without other organ involvement. She underwent urgent chirurgical treatment. The laboratory test fungal culture confirms Cryptococcus Neoformans paravertebral infections. Corticosteroid and methotrexate had been discounted. Che received anti-fungal systemic treatment with good outcome.
Conclusion: The association between sarcoidosis and Cryptocosis infections has been already descripted. This association may be due to the low CD4 T-cell count associated with sarcoidosis.

P1348
SECONDARY PSEUDOMYOPATHY DURING TERTIARY HYPERPARATHYROÏDISM

S. Derbal[1], S. Agoubi[1], D. Chebbi[1], O. Hentati[1], F. Ben Dahmen[1], M. Abdallah[1], Y. Cherif.[1]

[1]Univ. Tunis El Manar, Dept. of Internal Medicine, Regional Hospital of Ben Arous, Ben Arous, Tunisia

Acquired myopathy is an inflammatory clinico-pathological entity which can result of endocrine disorders. Thyroid, parathyroid, and even adrenal dysfunction can cause muscle damage through alteration of muscle cell metabolism.
Case report: A 49-year-old patient with medical history of arterial hypertension, chronic renal failure at the hemodialysis stage, complained of myalgia of both hips with progressive impotence, bilateral knee arthralgias and dysphagia to solids for 3 months. The examination found diffuse spontaneous and provoked myalgia with a bilateral and symmetrical proximal muscle deficit with positive comb and stool signs. The rest of the examination was unremarkable. Biological tests showed normocytic anemia, hypercalcemia at 3.65 mmol/l. All the rest of tests, particularly CPK and LDH and protein electrophoresis, were normal. MRI of the pelvis confirmed the presence of myopathy localized in the right adductor muscles in association with left trochanteric bursitis. Antinuclear antibodies were positive at 1/80 with a homogeneous appearance. The myositis kit, anti-ENA antibodies, anti-native DNA, rheumatoid factor and anti-CCP are all negative. The TSH and FT4 dosage was normal but a PTH was elevated at 2265 pg/ml. The diagnosis of endocrine secondary pseudomyopathy due to tertiary hyperparathyroidism was made. A subtotal parathyroidectomy was planned.
Conclusion: This case highlights secondary endocrine pseudomyopathy. Careful examination could guide the diagnosis which would be easy if the muscular manifestations occur, but much more delicate if they initiate the disease.

P1349
DYSTROPHIC KYPHOSCOLIOSIS IN NEUROFIBROMATOSIS TYPE I: A NEW CASE

M. Timoumi[1], S. Derbal[1], D. Chebbi[1], O. Hentati[1], F. Ben Dahmen[1], M. Abdallah[1], Y. Cherif[1]

[1]Univ. Tunis El Manar, Dept. of Internal Medicine, Regional Hospital of Ben Arous, Ben Arous, Tunisia

Neurofibromas are benign neural tumors deriving from the peripheral nerve sheath which are classified into three types of neurofibromatosis: neurofibromatosis 1 (NF1) previously known as von Recklinghausen disease, neurofibromatosis 2 (NF2) and schwannomatosis. NF1 is usually diagnosed in childhood, while NF2 and schwannomatosis are usually diagnosed in early adulthood. We will present the case of a 57 years old woman with NF1 with extensive dystrophic kyphoscoliosis.
Case report: The patient with a history of asthma for 20 y, cerebral ischemic stroke, mellitus diabetes, poorly balanced arterial hypertension, was admitted to the department of Internal Medicine for vitamin B12 deficiency which was discovered in the presence of macrocytosis without anaemia, associated with tingling paresthesia in

the 2 lower limbs. The anti-parietal cell and intrinsic factor antibodies were positive but there was no evidence of bulbar atrophy on gastric endoscopy. The disease started in childhood at the age of 4 y with the appearance of multiple pigmentary macules, gonadotropic and corticotropic insufficiency and delayed stature-weight, extensive kyphoscoliosis with advanced right convexity and vertebral rotary subluxation, dehiscence of the left occipital bone with ectasia and protrusion of the sigmoid sinus. However, the neurological examination did not reveal seizures, or signs of spinal cord compression or other neurological abnormalities. The patient suffered also from osteoporosis and hypovitaminosis D. All investigations of arterial hypertension especially of pheochromocytoma were negative. Cardiac and arterial ultrasound showed pulmonary arterial hypertension at 42mmhg with partially thrombosis of the right internal carotid artery aneurysm. Furthermore, the search of associated neoplasia was negative. Because of the extensive skeletal abnormalities, she did not underwent surgical procedure.

Conclusion: NF1 is considered as a multisystem disorder requiring management by multiple disciplines since it has dermatological, cardiovascular, endocrine, gastrointestinal, and orthopedicosteo-articular features. Skeletal abnormalities may be disabling. Therefore, medical interventions may improve the quality of life of patients.

P1350
LATE ONSET PAGET DISEASE OF PELVIC BONE IN ELDERLY: A CASE REPORT

S. Derbal[1], M. Timoumi[1], D. Chebbi[1], O. Hentati[1], F. Ben Dahmen[1], M. Abdallah[1], Y. Cherif[1]

[1]Univ. Tunis El Manar, Dept. of Internal Medicine, Regional Hospital of Ben Arous, Ben Arous, Tunisia

Paget disease of bone is usually diagnosed by accidental finding of osteolytic lesion. Nevertheless, it is crucial to differentiate the disease from metabolic and metastatic bone disorders in elderly patients.

Case report: An 88-year-old woman with a personal history of arterial hypertension, mellitus diabetes and osteoporosis was admitted to the department of internal medicine for sicca syndrome. The physical examination revealed arthralgias and bilateral pelvic pain. No other physical abnormalities were noticed. The blood chemistry results showed only mild elevation of alkaline phosphatase. The pelvic plain film showed asymmetric cortical thickening, sclerosis with coarsened trabeculae, in the pelvic bone. Thes lesions prevailed in the left site. Considering the image results clinical symptoms, the patient was diagnosed of asymptomatic Paget's disease without extended bone involvement. There was no evidence for bone metastasis. The patient was followed in the outpatient department with no fracture or other deformity.

Conclusion: Paget's disease and metastatic bone disorders shared similar clinical and laboratory features in elderly. The doctor might ensure accurate diagnosis of Paget's disease to prevent further extensive bone lesions and their poor outcomes.

P1351
SARCOIDOSIS AND CALCIUM HOMEOSTASIS DISTURBANCES: A RETROSPECTIVE STUDY

S. Derbal[1], D. Chebbi[1], Y. Cherif[1], O. Hentati[1], F. Ben Dahmen[1], M. Abdallah[1]

[1]Univ. Tunis El Manar, Dept. of Internal Medicine, Regional Hospital of Ben Arous, Ben Arous, Tunisia

Objective: Sarcoidosis is a systemic granulomatous disease. Hypercalcemia remains rare during sarcoidosis, in 10% of patients approximately. It is often not threatening. And transient. Hypercalciuria is much more common. It may affect 40–65% of patients. Increase production of 1,25-dihydroxyvitamin D3 is the main cause of calcium homeostasis disorders in sarcoidosis.

Methods: It's a retrospective single-center study. We included all patients followed for systemic sarcoidosis from January 2016 to December 2023. Epidemiological, clinical, biological, pathological, imaging and evolving data were reviewed from the patient files.

Results: We included 85 patients followed for sarcoidosis. Disorders of calcium metabolism were documented in 17.64% of patients. They were 13 women and two men. The mean age was 52.8 y. Mediastinal or pulmonary involvement was diagnosed in 13 patients. Five patients had elevated angiotensin-converting enzyme levels. All patients had systemic sarcoidosis. Hypercalcemia, documented in 4.7% of patients, ranged from 2.65–3.3 mmol/l. Hypercalcemia was rarely threatening with improvement after hydration. Hypercalciuria was documented in 12.9% of cases. There were no statistically significant differences in clinical or laboratory characteristics between the two groups of patients with or without abnormal calcemia or calciuria. Five patients required systemic corticosteroids for other organ involvement.

Conclusion: Hypercalcemia and hypercalciuria are not as common as described in the literature concerning calcium metabolism in sarcoidosis. Vitamin D deficiency, which is common in our population, may be a likely explanation. A multicenter study is needed to reassure these data.

P1352
OSTEOARTICULAR INVOLVEMENT IN PATIENTS WITH SARCOIDOSIS: A RETROSPECTIVE STUDY

S. Derbal[1], S. Agoubi[1], D. Chebbi[1], O. Hentati[1], F. Ben Dahmen[1], M. Abdallah[1], Y. Cherif.[1]

[1]Univ. Tunis El Manar, Dept. of Internal Medicine, Regional Hospital of Ben Arous, Ben Arous, Tunisia

Objective: Sarcoidosis is a systemic granulomatous disease. Osteoarticular involvement is frequent in sarcoidosis. It occurs in more than 50% of cases. However, bone damage or involvement is very rare and occurs in only 3–13% of people.

Methods: It's a retrospective single-center study. We included all patients followed for sarcoidosis from January 2016 to December 2023. Epidemiological, clinical, biological, pathological, imaging and evolving data were reviewed from the patient files. We included patients with osteoarticular involvement to analyse the clinical and radiological pattern.

Results: Data of 85 patients followed for sarcoidosis were analysed. We included 30 patients (35,3%) with osteoarticular involvement. They were 29 women and one man. The average age was 53.3 y. Osteoarticular involvement revealed the disease in 33.3% of cases. Arthritis or joint pain were polyarticular in all cases. Three patients had bone sarcoidosis with granuloma in bone biopsy in the cases. In one case, it revealed the disease. All patients had systemic sarcoidosis with mediastino-pulmonary involvement in 96.6%. Other organ involvement and symptoms were sicca syndrome, neurological, ocular, hepatosplenic and cardiac in 33.3%, 16.6%, 16.6%, 13.3% and 6.6% of cases respectively. Two patients had Lofgren syndrome. Two patients had hypercalcaemia and six patients had hypercalciuria. Angiotensin-converting enzyme levels were increased in 43.3% of cases. Nine patients (30%) had abnormal finding on joint imaging assessment. Corticosteroid therapy was prescribed in 56,6% of patients with a good outcomes.

Conclusion: Joint pain or arthritis are oligoarticular or polyarticular. Isolated diagnosis is not evident for bone sarcoidosis, so imaging and biopsies are useful. Osteoarticular involvement is probably

underdiagnosed since it is often asymptomatic. Assessing asymptomatic lesions with imaging investigation must be more frequent.

P1353
EFFECTS OF TOTAL KNEE AND HIP ARTHROPLASTY ON SLEEP QUALITY

Y. El Mabrouk[1], L. Rouached[2], S. Zanned[2], A. Ben Ammou[1], A. Ben Abid[1], M. Bellil[1], S. Bouden[2], A. Ben Tekaya[2], I. Mahmoud[2], R. Tekaya[2], O. Saidane[2], M. Kooli[1], M. Ben Salah[1], L. Abdelmoula[2]

[1]Charles Nicolle Hospital, Orthopedic Surgery Dept., [2]Charles Nicolle Hospital, Rheumatology Dept., Tunis, Tunisia

Objective: Symptomatic osteoarthritis is a prevalent indication for total knee and hip arthroplasty (TKA and THA). Pain associated with osteoarthritis often leads to sleep disturbances in affected individuals. This study aims to evaluate the impact of TKA and THA on the sleep quality of patients with osteoarthritis.
Methods: Conducted as a cross-sectional study from July 2022 to July 2023, this research included patients undergoing primary or secondary TKA or THA. Data collected encompassed sociodemographic information, comorbidities, prosthesis indications, and postoperative therapeutic interventions (analgesia, rehabilitation, psychotherapy). Pain intensity was assessed using the visual analog scale (VAS) ranging from 0–100. Sleep quality was measured through the Pittsburgh Sleep Quality Index (PSQI), evaluating seven domains: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction over the last month. Each domain scored from 0 (no difficulty) to 3 (severe difficulty), with an overall score ranging from 0 (good) to 21 points (poor sleeper). Catastrophism was assessed using the Pain Catastrophizing Scale (PCS), with a PCS > 30 indicating a high level of catastrophism.
Results: The study comprised 87 patients with a mean age of 54.24 ± 15.7 and a sex ratio (M/F) of 1.02. THA and TKA were performed in 55% and 45% of cases, respectively. Comorbidities included fibromyalgia (16%), depressive syndrome (11%), and anxiety disorder (2%). Prosthetic surgery addressed primary osteoarthritis in 55% and secondary osteoarthritis in 42%, with various etiologies. PSQI mean score was 7.7 ± 6.7 [0–21], with 40%, 30%, and 24% having PSQI scores ≤ 5, $5 <$ PSQI score ≤ 11, and PSQI score > 11, respectively. PCS mean was 17.25 ± 8.9 [2–40], with 12% having a PCS > 30. Perioperative psychological support was reported by 26% of patients. PSQI score correlated significantly with fibromyalgia ($p = 0.000$), pain VAS ($p = 0.000$), rheumatic disease ($p = 0.000$), knee osteoarthritis severity ($p = 0.011$), and PCS ($p = 0.000$). THA patients had higher PSQI scores (> 11) compared to TKA (35 vs. 10%, $P = 0.000$).
Conclusion: TKA and THA represent effective interventions for addressing pain and functional loss in symptomatic osteoarthritis. These procedures contribute to long-term improvements in sleep quality for individuals with symptomatic osteoarthritis.

P1354
ASSESSMENT OF PATIENT-REPORTED PAIN, FUNCTION AND QUALITY OF LIFE OUTCOME FOLLOWING TOTAL HIP AND TOTAL KNEE ARTHROPLASTIES

L. Rouached[1], Y. El Mabrouk[2], S. Zanned[1], A. Ben Ammou[2], A. Ben Abid[2], M. Bellil[2], S. Bouden[1], A. Ben Tekaya[1], I. Mahmoud[1], R. Tekaya[1], O. Saidane[1], M. Kooli[2], M. Ben Salah[2], L. Abdelmoula[1]

[1]Charles Nicolle Hospital, Rheumatology Dept., [2]Charles Nicolle Hospital, Orthopedic Surgery Dept., Tunis, Tunisia

Objective: Total hip and total knee arthroplasties (THA, TKA) are widely acknowledged as reliable surgical procedures for restoring patient functionality. However, there is limited data characterizing the recovery process using validated knee and hip-related questionnaires. We aimed to evaluate patient-reported Pain, Function, and Quality of Life outcome after THA and TKA for osteoarthritis, utilizing the Knee Injury and Osteoarthritis Outcome Score (KOOS) and Hip Disability and Osteoarthritis Outcome Score (HOOS).
Methods: A cross-sectional study was conducted from July 2022 to July 2023, involving patients undergoing THA or TKA for primary or secondary osteoarthritis in the department of rheumatology and orthopedic surgery. Sociodemographic data, comorbidities, prosthesis indications and postoperative therapeutic modalities (analgesia, rehabilitation, psychotherapy) were collected. Pain intensity was assessed using the visual analog scale (VAS) ranging from 0–100. The functional impact of knee and hip osteoarthritis was evaluated using the KOOS-Physical Function Shortform (KOOS-PS) and HOOS-Physical Function Shortform (HOOS-PS), respectively. It contains 12 questions, with each question scored from zero (no knee or hip problems) to four (extreme knee or hip problems) points. The summary knee or hip impact score is calculated as an average of the Pain, Function, and Quality of Life scale scores. Overall, scores range from 0 to 100, where, in contrast to the individual questions, 0 is the worst possible and 100 is the best possible score.
Results: 87 patients participated, with a mean age of 54.24 ± 15.7 and a sex-ratio of 1.02. 55% received a total hip prosthesis, and 45% received a total knee prosthesis. Comorbidities included fibromyalgia (16%), depressive syndrome (11%), and anxiety disorder (2%). Primary osteoarthritis accounted for 55% of cases, while secondary osteoarthritis constituted 42%, with various etiologies: 14% for aseptic osteonecrosis, 4% for sequelae of septic arthritis and in one case for articular chondrocalcinosis. Mean KOOS and HOOS scores were 54.8 ± 22.5 and 56.1 ± 21.2, respectively, with over 50% of patients scoring above 50. Psychological support was reported by 26% of patients and significantly associated to HOOS ($p = 0.000$), but not to KOOS ($p = 0.3$), and those undergoing physical therapy (68%) demonstrated higher scores ($p = 0.000$). Low KOOS scores were significantly associated with fibromyalgia, pain VAS, rheumatic disease, knee osteoarthritis severity, and BMI (all $p < 0.005$). Low HOOS scores were associated with fibromyalgia, pain VAS, and the presence of rheumatic disease (all $p < 0.01$), but not with hip osteoarthritis severity or BMI.
Conclusion: Primary TKA may lead to improved patient-reported outcomes, particularly in those undergoing physical therapy. Comprehensive care is essential to enhance the quality of life for these patients.

P1355
UNITING THE DICHOTOMY BETWEEN PRIMARY AND SECONDARY PREVENTION OF OSTEOPOROSIS: A COMMUNITY- BASED INTERVENTION

Y. El Miedany[1], A. Gadallah[2], M. Sarhan[3], M. Elgaafary[2], A. Ahmed[3]

[1]Canterbury Christ Church Univ., Canterbury, UK, [2]Ain Shams Univ., Cairo, Egypt, [3]Egyptian Food Bank, Cairo, Egypt

Objective: Osteoporotic fractures, are associated with consequent negative impacts on health, quality of life, functional ability as well as independence. The overarching goal of treating osteoporotic patients is to reduce the incidence of fractures, yet interventions that support early detection of osteoporosis and prevention of osteoporotic fractures are underutilized. Recently, a groundbreaking collaboration between the WHO with ESCEO and the IOF for the prioritization of osteoporosis and fragility fracture prevention within global healthcare policy. In concordance with this new approach, this project has been

launched to lay the groundwork for a national approach for prevention of osteoporosis and fragility fractures in Egypt. Aims: 1. to set up a national program implementing "Targeting to Treat" approach to identify and treat subjects at high or very high risk of fragility fracture in care homes in Egypt. 2. To assess the applicability of using a comprehensive questionnaire for assessing the risk of fractures in older adults in the community. 3. To evaluate the evidence on interventions for preventing fracture in older adults.

Methods: This is a national quality improvement program adopting a Plan, Do, Study, Act (PDSA) cycle methodology. The project is a joint activity provided by the Egyptian Food bank and the Egyptian Academy of Bone and Muscle Health in collaboration with the ministry of Social Solidarity. All older adults living in care homes in Egypt, aged 50-years and above have been invited to join this project of primary prevention of osteoporosis. A list of eligible patients was generated through the national record. Every participant has been invited to complete a questionnaire to assess for Fracture risk, Falls risk, Sarcopenia Risk, functional disability, as well as comorbidities and current medications intake. US scan of the heals will be carried out for every enrolled person. Patients at high/very high fracture risk will be subjected to DXA scan. Rehabilitation program will be provided by local physio teams under supervision of the Rehab physicians to reduce sarcopenia and fall risk. Patient education and counselling program will be provided by the treating doctors. This work describes the protocol of the activity which has been set up in Cairo and Giza as an initial phase. Blood tests for Vitamin D serum levels and bone profile will be assessed for all subjects enrolled in this work. Supplement therapy will be provided for those participants wherever required.

Results: Reviewing the self-completed questionnaire will facilitate the recognition of subjects at high / very high fracture risk, high falls risk as well as sarcopenia risk. The patients will be stratified according to the underlying pathology and risk factors. Rehab program will be set up to tackle these risk factors. The Egyptian food bank will provide food and vitamin D supplement to the elder in need, identified based on their lab tests. Osteoporosis therapy will be offered according to national guidelines to the patients according to their fracture risk. Regular monitoring of the patients will be carried out to check for the progress of the falls and sarcopenia status as well as adherence to therapy.

Conclusion: This community intervention program of screening for osteoporosis, falls and sarcopenia along with continued medical care and patient education is expected to result in a significant improvement in the musculoskeletal healthcare in the care homes that we hope to expand to cover all the care homes at the national level. Providing comprehensive pharmacological as well as non-pharmacological management is expected to reduce the risk of developing fragility fractures.

P1356
BRIDGING THE BINARIES: CLOSING THE GAP BETWEEN PRIMARY AND SECONDARY PREVENTION OF OSTEOPOROSIS AND FRAGILITY FRACTURE

Y. El Miedany[1], A. Baraka[2], M. Elgaafary[3], W. Elwakil[2]

[1]Canterbury Christ Church Univ., Canterbury, UK, [2]Alexandria Univ. faculty of Medicine, Alexandria, Egypt, [3]Ain Shams Univ., Cairo, Egypt

Objective: Osteoporotic fractures, are associated with consequent negative impacts on health, quality of life, functional ability as well as independence. The overarching goal of treating osteoporotic patients is to reduce the incidence of fractures, yet interventions that support early detection of osteoporosis and prevention of osteoporotic fractures are underutilized. Recently, the WHO, IOF and ESCEO announced a collaborative 5-y collaborative agreement to set up strategic roadmap of osteoporosis and fracture prevention within global healthcare agendas. In concordance with this new deal, this project has been set up to lay the groundwork for the prioritization of osteoporosis and fragility fracture prevention in Egypt. We aimed to implement a national community-based program implementing Targeting to Treat approach to identify and treat subjects at high or very high risk of fragility fracture in the Egyptian community and to assess the satisfaction of internal (physicians) and external customers (clients/participants) about the program. 2. assess the doctors' knowledge, attitude, training and experience of the medical students and training doctors involved in the project. 3. Assess the impact of the service on the patient's bone and muscle health.

Methods: This is a national community program carried out using one of the quality improvement tool that is PDC/SA cycle: Plan, Do, Check/Study, Act (PDCSA) cycle methodology. The project is a joint activity provided by Alexandria University and the Egyptian Academy of Bone and Muscle health. Training program will be offered to 5th year medical students and junior physicians house officers on bone and muscle health. A baseline questionnaire will be used to assess the medical students and trainees' perception and performance regarding osteoporosis and risk of fracture. All adults, 50-years old and above, living in the community in Alexandria, will be invited to join this project of primary prevention of osteoporosis. After taking the patient's consent, every participant will be invited to complete a questionnaire to assess the risks for fracture, falls, sarcopenia, as well as functional disability, comorbidities and current medications intake. US scan of the heels will be carried out for every person. Patients at high/very high fracture risk will have a DXA scan. Rehabilitation program will be provided by local physio teams under supervision of the rehab physicians. Patient education and counselling program will be provided by the treating doctors to overcome risk of fall and sarcopenia. This work describes the protocol of the activity which has been set up in the governorate of Alexandria as initial phase.

Results: Reviewing the self-completed questionnaire will facilitate the recognition of subjects at high / very high fracture risk, high falls risk as well as sarcopenia risk. The patients will be stratified according to their underlying pathology and risk factors. Rehab program will be set up to address the common risk factors. Osteoporosis therapy will be offered according to national guidelines to the patients according to their fracture risk. Regular monitoring of the patients will be carried out to check for the incidence of the falls and sarcopenia status as well as adherence to therapy. The doctors' perception and performance will be assessed by asking the contributing doctors to complete a second copy of the questionnaire and an observation checklist.

Conclusion: The program of screening for osteoporosis, falls and sarcopenia along with continued medical care and patient education is expected to result in a significant improvement in the musculoskeletal healthcare in the community in northern Egypt that will be a drive to be expanded a national level. There will be also paralleled by a positive impact on the training doctors knowledge and experience that is expected to reflect positively on the older adult musculoskeletal care.

P1357
ALL ONE MUSCULOSKELETAL HEALTH: A NATIONAL CAMPAIGN FOR EARLY OSTEOPOROSIS DIAGNOSIS AND PREVENTION OF FRAGILITY FRACTURES—A PROJECT BY THE EGYPTIAN ACADEMY OF BONE HEALTH

Y. El Miedany[1], M. Elgaafary[2], N. Gadallah[2], S. Mahran[3], W. Hassan[4], M. Abu Zaid[5], W. Elwakil[6]

[1]Canterbury Christ Church Univ., Canterbury, UK, [2]Ain Shams Univ., Cairo, Egypt, [3]Assiut Univ., Assiut, Egypt, [4]Benha Univ., Benha, Egypt, [5]Tanta Univ., Tanta, Egypt, [6]Alexandria Univ. Faculty of Medicine, Alexandria, Egypt

Objective: Osteoporosis and its associated fragility fractures are a top priority, and efforts are focussing on early detection and smarter solutions to prevent its linked fractures. All One Musculoskeletal Health is a collaborative, multisectoral, and transdisciplinary approach which can be implemented at the local, regional, national, and global levels, with the goal of achieving optimal health outcomes recognizing the interconnection between different medical specialties dealing with bone and muscle health. This project launched by the Egyptian Academy of Bone Health has evolved beyond the traditional approaches and offers comprehensive whole health strategy. It will take forward and develop a new suite of services designed to strengthen bone and muscle health, transform physical health, build financial wellness, and help people, stakeholders, as well as professional organizations unleash their full potential. Aims: 1. to set up a national program implementing "All One Musculoskeletal Health" approach to identify and treat subjects at high or very high risk of fragility fracture in Egypt. 2. To evaluate the evidence on interventions for preventing fragility fracture in older adults targeting the reduction of osteoporotic fractures by 25% in 2026.

Methods: A 5-step framework that provides structure for using a One Musculoskeletal Health approach in stratifying and recognizing the patients at risk of developing osteoporosis or at high risk of sustaining a fracture. These include: step 1-Engagement: which include identifying and engaging relevant specialties with relevance to bone and muscle health and potential stakeholders. Step 2 – Assessment: Conduct gap analysis, map infrastructure, understand limitations and disparities in resources within the relevant specialties. In addition, economic assessment is carried out. Step 3-Planning: Develop plans and protocols for prioritizing bone and muscle health that include and leverage all relevant One Health segments. Step 4-Implementation: Implementing the programs that facilitate identifying patients at high risk of osteoporosis, fractures, falls as well as sarcopenia. Step 5-monitoring and evaluation of outcomes: Identify outcomes, provide management, assess improvement upon weaknesses of One musculoskeletal Health systems and/or programs.

Results: One Musculoskeletal Health program is expected to be an effective approach to build multidisciplinary sustainable coordination and collaboration across all the medical and surgical specialties dealing with bone and muscle health. Statistical analysis is expected to change the map of bone health management at the national level. Initiating such coordination through a disease-specific program (osteoporosis) that adopts a One Health approach to initially focus on a key priority parameter is expected to be more tractable in the short term. Individual patient's risks are identified based on baseline questionnaire. Clinical assessment, investigations, and management plan are set tailored to the individual patient's risk(s). Osteoporosis therapy is provided according to national protocols. Reassessment and evaluation of outcomes are carried out on regular basis, subject the patient's condition. National data register will be set.

Conclusion: The All One Musculoskeletal Health is expected to provide whole national bone and muscle health support, improve access to care, and solutions for what matters most right now. All One musculoskeletal Health is transforming the older adults experience by combining all the benefits of digital and traditional management approach to bring fast, effective, high-quality care for all. This expansion into whole health solutions also includes a renewed vision for the future with a drive towards positive change powered by people who care. By promoting the involvement of different medical and surgical specialties, the All One musculoskeletal Health approach can achieve the best health outcomes for people at risk of osteoporosis or sustaining a fragility fracture.

P1358
A PILOT STUDY OF THE IMPACT OF FRACTURE SITES ON QUALITY OF LIFE AMONG ELDERLY

Y. Z. Lin[1], K. L. Wu[2], C. H. Wu[3], Y. F. Chang[3], J. C. Hsu[4]

[1]National Cheng Kung Univ. School of Pharmacy, Tainan, [2]Dept. of Family Medicine, Tainan Municipal Hospital (Managed by Show Chwan Medical Care Corporation), Tainan, [3]Dept. of Family Medicine, National Cheng Kung Univ. Hospital, College of Medicine, National Cheng Kung Univ., Tainan, [4]Taipei Medical Univ. International Ph.D. Program in Biotech and Healthcare Management, Taipei, Taiwan.

Objective: Due to the elderly population growing, the prevalence of osteoporosis and fractures in Taiwan increased rapidly. The aim of the study is to analyze the impact between fracture site and quality of life for osteoporosis and fracture prevention.

Methods: We enrolled the subjects who was $\geq$ 65 years old and diagnosed with osteoporosis in out-patient setting of Family Medicine Department at National Cheng Kung University Hospital from Feb 2020 to Aug 2020. Each participant filled out a structured questionnaire with the help of administrative staff well-trained in conducting face-to-face interviews. After excluding missing BMD and fractures data, a total of 83 subjects were enrolled to our final analysis. We use EuroQol 5-dimentional questionnaire (EQ-5D) and visual analogue scale (VAS) to assess quality of life, and calculated EQ-5D index by time trade-off. The impact of fracture and quality of life was analyzed. Moreover, the impact between different fracture site and EQ-5D index was also assessed.

Results: A total of 83 subjects, the average age was 73.5 $\pm$ 6.2 years old, and female was 94.0%. Among these subjects, 33 had no fracture history, 41 had spine fracture, 6 had hip fracture, and 6 had other site fracture. The average EQ-5D index without/with fracture history was 0.72 $\pm$ 0.18 and 0.55 $\pm$ 0.27 respectively ($p = 0.001$). The average VAS without/with fracture history was 71.70 $\pm$ 10.87 and 64.00 $\pm$ 14.11 respectively ($p = 0.01$). Besides, the average EQ-5D index in hip and spine fracture was 0.37 $\pm$ 0.21 and 0.55 $\pm$ 0.28 respectively. We also found that 81.8% of subjects without fracture was freely movable. However, 0% and 44.7% of subjects with hip and spine fracture was freely movable, in spite of fractures had happened over 5 years.

Conclusion: In elderly, compared with the subjects without fracture, subjects who had fracture history had lower quality of life, in spite of fractures had happened over 5 years. Furthermore, hip fracture had lowest quality of life, especially in mobility and daily activity.

P1359
N-TERMINAL PRO-BRAIN NATRIURETIC PEPTIDE LEVELS IN PATIENTS WITH RHEUMATOID ARTHRITIS WITH THE INEFFECTIVENESS OF BASIC ANTI-INFLAMMATORY THERAPY

Y. Gorbunova[1], I. Kirillova[1], T. Popkova[1], E. Nasonov[1]

[1]VA Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: N-terminal pro-brain natriuretic peptide (NT-proBNP)—an amino acid peptide that is located in the myocardium and is released into the blood in response to an increase in volume and pressure in the left or right ventricles. Its high prognostic significance was noted in the development of cardiovascular diseases (CVD) in rheumatoid arthritis (RA) and in the general population. According to the literature, the level of NT-proBNP is closely related to the level of proinflammatory cytokines (TNFα, IL-6), which play an important role in the pathogenesis of RA. We aimed to clarify the value of NT-proBNP in RA patients with the ineffectiveness of basic anti-inflammatory therapy, to compare the level of NT-proBNP with traditional risk factors (TFR) CVD and markers of inflammation.
Methods: The study included 43 patients with RA (34 women/9 men) with the ineffectiveness of basic anti-inflammatory drugs; median (Me) age was 53 [38; 63] y (49% of patients older than 55 years); disease duration—60 [36; 180] months; with high disease activity—DAS28—5,9 [5,2; 6,4] points. The majority of patients were seropositive for IgM rheumatoid factor (81.4%) and for antibodies to cyclic citrullated peptide (74.4%). At the time of inclusion in the study, 44% of patients received methotrexate (MTX) (median dose—15 (15;20) mg/week.), 35%—leflunomide, 9.3%—sulfasalazine, 7%—hydroxychloroquine, 67.4%—glucocorticoids (median dose—5 (4;8) mg/d.), 74%—nonsteroidal anti-inflammatory drugs, 12%—statins. In 19% of patients, the inefficiency of 3 or more of basic anti-inflammatory drugs was noted. In RA patients, a high incidence of TRF was found: arterial hypertension—in 12%, dyslipidemia—40%, smoking—10%, overweight—42%, burdened heredity for CVD—37%, hypodynamia—77% of patients. The control group consisted of 27 healthy donors, comparable to patients by age and gender. The concentration of NT-proBNP was determined in blood serum by electrochemiluminescence (Roche Diagnostics, Switzerland), values less than 125 pg/ml were taken as normal values. All patients completed the HAQ (Health Assessment Questionnaire) before being included in the study.
Results: Patients with RA had higher levels of NT-proBNP (114.8 [45.1; 277.5] pg/ml) compared to the healthy control group (52 [40.5; 69.1] pg/ml, $p < 0.05$). In 19 (44%) patients with RA, the level of NT-proBNP exceeded the norm ($\geq$ 125 pg/ml), and in the control group remained within the normal range. Patients with RA, depending on the level of NT-proBNP, were divided into two groups: group 1 (n = 19) with the level of NT-proBNP $>$ 125 pg/ml; group 2 (n = 24)—with the value of this indicator $\leq$ 125 pg/ml. Group 1 patients were older (62 [49; 69] vs. 43 [37; 55]) and had a higher HAQ value (1.75 [1.38; 1,9] vs. (1,37 [1; 1,6]) than group 2 patients. In the whole group (n = 43), the level of NT-proBNP positively correlated with age (r = 0.55; p = 0.0002), BMI (r = 0.38; p = 0.2), HAQ level (r = 0.41; p = 0.008). In group 1, there was a direct correlation between the concentration of NT-proBNP with the activity of RA (DAS28) (r = 0.48; p = 0.02) and age (r = 0.46; p = 0.03), the reverse was observed with the level of total cholesterol (r = -0.44; p = 0.03).
Conclusion: The level of NT-proBNP in the serum of RA patients with the ineffectiveness of basic anti-inflammatory therapy is higher than in the control group. Elevated levels of NT-proBNP were associated with age, RA activity, an increase in BMI, and an indicator of HAQ health assessment.

P1360
ASSESSMENT OF PAIN AND HEALTH STATUS OF A PATIENT WITH EARLY RHEUMATOID ARTHRITIS, DEPENDING ON BODY MASS INDEX

Y. Gorbunova[1], L. Kondratyeva[1], T. Popkova[1], E. Nasonov[1]

[1]VA Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: Adipose tissue produces a large number of different proinflammatory cytokines (IL-1, IL-6, TNFα, leptin) involved in the pathogenesis of RA. Obesity in rheumatoid arthritis (RA) is associated with high activity of the disease, with rare achievement of remission, decreased effectiveness of therapy, as well as worse patient ratings of pain severity and overall health status on a visual analog scale (VAS). We aimed to clarify the effect of BMI on the patient's pain and health indicators according to VAS in patients with early RA.
Methods: The study included 74 patients (54 women/20 men) with early RA (ACR/EULAR criteria, 2010), 56 [46,0; 61,0] y, without experience of taking glucocorticoids and disease-modifying antirheumatic drugs. The median duration of the disease was 7.0 [4.0; 8.0] months, seropositivity according to IgM RF and ADC, with high RA activity (DAS28 5.6 [5.0; 6.3]; SDAI 35.4 [27.0; 45.8], CDAI 31.0 [26.0; 44.0]). Leptin levels were measured using ELISA enzyme immunoassay (DBS – Diagnostics Biochem Canada Inc.). Leptin levels were considered elevated at values $\geq$ 11.1 ng/ml for women, $\geq$ 5.6 ng/ml for men. Overweight status/Obesity was determined according to the criteria of the WHO in patients with a BMI $\geq$ 25 kg/m^2. The assessment of pain and health status by the patient (doctor) was carried out using a visual analog scale (VAS), with a gradation from 0–100 mm.
Results: Overweight/obesity was found in 39 (52.7%) patients with early RA, 33 (44.6%) of 47 patients had high levels of leptin. Patients with early RA, depending on the level of BMI $\geq$ 25 kg/m^2, were divided into 2 groups: I (n = 39)—overweight/obese RA patients (BMI $\geq$ 25 kg/m^2); II (n = 35) – normal BMI ($<$ 25 kg/m^2). When comparing the groups, they significantly differed in age: 56 vs. 47 years; pain level: 61 vs. 50 mm; level VAS according to the patient: 60 vs. 50 mm; level VAS according to the doctor: 56 vs. 46 mm; blood pressure indicators: SBP (127 vs. 117 mmHg) and DBP (81 vs. 73 mmHg). ($p < 0.05$ in all cases). The pain index correlated with the level of ESR (r = 0.41, p = 0.008), CRP (r = 0.46, p = 0.003); BMI with the level of TG (r = 0.33, p = 0.04) and leptin (r = 0.37, p = 0.02) in the overweight/obese group. There is a direct correlation between BMI with glucose level (r = 0.37, p = 0.02), CRP level with the number of swollen joints (r = 0.38, p = 0.02) and morning stiffness (r = 0.56, p = 0.009) in the normal weight group.
Conclusion: Patients with early RA and overweight/obese had higher pain levels and health status according to a visually analog scale, compared with patients with a normal BMI.

P1361
COMPARISON OF THREE-DIMENSIONAL PROXIMAL FEMUR BONE STRUCTURE ACCORDING TO BONE EROSION IN POSTMENOPAUSAL FEMALE RHEUMATOID ARTHRITIS PATIENTS

Y. J. Choi[1], J. W. Kim[2], J. Y. Jung[2], C. H. Suh[2], Y. S. Chung[1], H. A. Kim[2]

[1]Dept. of Endocrinology and Metabolism, Ajou Univ. School of Medicine, [2]Dept. of Rheumatology, Ajou Univ. School of Medicine, Suwon, South Korea

Objective: Rheumatoid arthritis (RA) is commonly acknowledged as one of the important causes of secondary osteoporosis. It is also

widely recognized that patients with RA who have bone erosion likely have more severe disease activity. A novel software allows the 3-dimensional (3D) analysis of both trabecular and cortical compartments separately using DXA scans. Thus, this new tool is expected to contribute to better analysis of secondary osteoporosis, particularly in RA with bone erosion, where the involvement of cortical bone would be predominant. This retrospective study aims to compare the 3D bone structure according to bone erosion in postmenopausal female RA patients.
Methods: This study had a cross-sectional design. 171 postmenopausal women with RA aged 50 years or older were included in this study. Demographic and disease-specific parameters were documented, including anti-rheumatic treatment, bone erosion status, and previous fractures. The 3D bone structure analyses were conducted on the DXA hip scans using a 3D reconstruction tool.
Results: The study involved 94 patients in the erosion (-) group and 77 in the erosion (+) group. No significant differences in age, BMI, or comorbidities were observed, including osteoporosis and osteoporosis medication history. Disease duration, cumulative glucocorticoid doses, and disease activity parameters were significantly higher in the erosion (+) group. In the evaluation of 3D bone structure (cortical (CvBMD) and trabecular (TvBMD) volumetric BMD (mg/cm^3), the integral (IvBMD) of both compartments), the only significant differences observed between the two groups were in the 3D bone structures associated with the femur neck. After adjustment for other confounding factors, such as disease duration and cumulative steroid doses, only CvBMD exhibited a significant inverse relationship with disease activity score 28 (DAS28) (ß = -24.693, p = 0.023).
Conclusion: Using this novel 3D analysis tool, we found that the femur neck region might be predominantly impacted in RA patients with bone erosion. Additionally, it was feasible to verify using the tool that the disease's activity primarily affects the cortical bone in individuals with RA.

P1362
USE OF DUAL-ENERGY COMPUTED TOMOGRAPHY IN PATIENTS WITH UNDIFFERENTIATED ARTHRITIS: DATA FROM A PILOT RESEARCH

Y. Kuzmina[1], E. Panina[1], O. Zhelyabina[1], M. Eliseev[1], M. Chikina[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To analyze the experience of practical use of dual-energy computed tomography (DECT) in patients with arthritis of the joints of the lower limb.
Methods: The study included 13 patients (10 men and 3 women) who applied to the V.A. Nasonova Research Institute of Rheumatology with acute arthritis of the joints of the lower limb. The average age of the patients was 50 y. Patients underwent standard examination methods to verify the diagnosis of gout (puncture of the affected joint, ultrasound, radiography, determination of serum uric acid (sUA) level), and the level of C-reactive protein (CRP) was additionally assessed. According to the examination results, not a single patient met the 2015 ACR-EULAR Gout Classification Criteria. To verify the diagnosis, all patients underwent DECT of the joints of the lower limb. The study was performed on a Siemens SOMATOM Definition Flash computed tomograph with subsequent evaluation of the resulting images in the Syngo DE Gout application.
Results: In none of the patients did puncture of the affected joint confirm the presence of monosodium urate crystals in the synovial fluid. A sUA level of more than 360 μmol/l was detected in 9 (69.2%) patients from the group, the CRP level exceeded the norm (> 5 mg/l) in 5 (38.5%) patients. According to radiography of the joints of the lower limb, only 3 (23.1%) showed typical changes characteristic of gout. Ultrasound gave a positive result in 5 (38.5%) patients, but raised doubts, while in 7 patients (53.8%) DECT was decisive for the diagnosis of gout.
Conclusion: DECT is a promising method, along with ultrasound, for the diagnosis of gout in patients with undifferentiated arthritis and suspected microcrystalline disease.

P1363
USE OF DUAL-ENERGY COMPUTED TOMOGRAPHY IN PATIENTS WITH ATYPICAL LOCALIZATION OF GOUT: DESCRIPTION OF A CASE SERIES

Y. Kuzmina[1], M. Eliseev[1], O. Zhelyabina[1], E. Panina[1], M. Chikina[1]

[1] V.A. Nasonova Research Institute of Rheumatology, Moscow, Russia

Objective: To analyze the practicality of using dual-energy computed tomography (DECT) in patients with gout and lesions of the axial skeleton.
Methods: Included 7 patients (4 men and 3 women) with a previously established diagnosis of gout based on the 2015 ACR-EULAR Gout Classification Criteria, aged 37–80 y, with pain and limited function in the spine (4 patients) and in the projection of large joints (hip (2 patients) and shoulder joints (1 patient)). 2 patients had a combination of gout and ankylosing spondylitis. In all patients, serum uric acid (sUA) level was assessed at the time of presentation and consistent MRI and DECT of the affected joints and spine were performed. The study was performed on a Siemens SOMATOM Definition Flash computed tomograph with subsequent evaluation of the resulting images in the Syngo DE Gout application.
Results: In 6 patients (85.7%) the sUA level exceeded the upper limit of normal (> 360 μmol/l). According to the results of MRI, none of the patients showed signs of deposition of monosodium urate (MSU) crystals in the examined area. In 6 patients (85.7%), DECT confirmed lesion to the axial skeleton as part of gout. In 1 patient (14.3%), DECT revealed a combination of gout and calcium pyrophosphate crystal deposition disease in the shoulder joint.
Conclusion: The use of DECT is practical and expedient for assessing the presence of MSU crystals in the axial joints and spine in patients with atypical gout.

P1364
COMPARISON OF BONE MINERAL DENSITY BETWEEN VETERANS AND NON-VETERANS AND ITS IMPACT ON FRACTURE RISK ASSESSMENT

Y. L. Teng[1], S. Y. Lin[1], T. Y. Chen[2], H. T. Lee[3], Y. M. Chen[4]

[1]Osteoporosis Prevention Center, Taichung Veterans General Hospital, [2]Neurosurgery, Taichung Veterans General Hospital, [3]Lee General Hospital, [4]Division of Allergy, Immunology and Rheumatology, Taichung Veterans General Hospital, Taichung, Taiwan.

Objective: Veterans are a special group of people with special characteristics. With the aging of this population, the issue of osteoporotic fractures has become more and more important. This study aims to compare the BMD and fracture rates between male veteran patients and non-veteran patients.
Methods: A retrospective analysis was conducted from January 2010 to December 2022, involving 1427 veterans who underwent DXA for the first time at Taichung Veterans General Hospital. Veteran patients were matched by age and gender with non-veteran patients in a 1:1 ratio. Conditional logistic regression was used to analyze factors

related to fractures and to explore differences in BMD, bone quality, and fracture sites among first-time fracture cases.
Results: There was no significant difference in the average age between veterans and non-veterans (76.58 ± 10.92 vs. 76.58 ± 10.92; $p = 1.000$). Conditional logistic regression revealed that, despite better L spine BMD in veterans (HR: 0.39; $p < 0.001$), it was associated with a higher fracture rate (HR: 1.200; $p = 0.005$). Further analysis within the fracture group showed that veterans had higher BMD and T-scores than non-veterans ($p < 0.001$), more fractures occurred in the Radius ($p = 0.036$), and Osteoarthritis was more prevalent in the chronic disease aspect ($p < 0.001$).
Conclusion: Despite better BMD in veterans, a higher fracture incidence was noted. We speculated that more prevalent osteoarthritis in veterans may lead to the formation of bone spurs, potentially misinterpreted as actual bone tissue in DXA scan. It is recommended that future radiological assessments of BMD take this condition into consideration to enhance the accuracy of results. This study provides crucial clinical insights for developing more effective guidelines for BMD assessment.

P1365
HOW TO MONITOR AND DISCRIMINATE CAUSES OF LOWER LIMB SWELLING DURING HOME-BASED REHABILITATION AFTER TOTAL KNEE ARTHROPLASTY? A DELPHI STUDY

Y. Lin[1], R. Hong[1], L. Hui-Wu[1]

[1]Shanghai Ninth People's Hospital, Affiliated to Shanghai Jiaotong Univ. of Medicine, Shanghai, China

Objective: Swelling in the lower limbs after total knee arthroplasty (TKA) hinders surgical outcomes. Prolonged duration of swelling requires monitoring and remote management during home-based rehabilitation. Various causes of swelling exist, but there is a lack of indicators to monitor and discriminate different causes of lower limb swelling, making it difficult to implement targeted interventions. This study aims to clarify the indicators to monitor and discriminate the causes of lower limb swelling during home-based rehabilitation after TKA by literature research and consulting experts from various disciplines.
Methods: The Delphi method was used. Based on literature research and analysis, a preliminary draft of indicators was developed. Fifteen experts from different disciplines were invited to evaluate the validity of the indicators and provide modification suggestions. Through two rounds of consultations, consensus was reached among the experts.
Results: After two rounds of Delphi consultations, consensus was reached. Agreement scores ranged from 4.40–5.00, with low variability (standard deviation 0.00–0.91) and high consistency (coefficient of variation 0.00–0.20). $P < 0.05$ in the Kendall's W with an agreement rate of 80.00–100%. In the final set of indicators, there were five primary indicators (representing four swelling causes and a general category), along with 23 secondary indicators and 40 tertiary indicators (further subdivisions of the secondary indicators).
Conclusion: This study has preliminarily established indicators for at-home differentiation of swelling post-TKA caused by four distinct reasons. Further research is needed to validate the value of these indicators in distinguishing the causes of swelling. In the future, the development of remote monitoring systems or devices to collect data on these indicators could enable personalized interventions tailored to specific swelling causes for patients.

P1366
RELATIONSHIP BETWEEN COMMUNITY-DWELLING ELDERLY INDIVIDUALS WITH PRE-FRAILTY AND APPETITE

Y. M. Yoshiki[1], M. I. Masakazu[1], W. I. Wataru[1], S. T. Shotaro[1], R. I. Risa[1], K. N. Kazuma[1], H. K. Hayato[1], M. N. Misa[1], F. T. Fumie[1], T. M. Tatsunori[1], T. K. Takanari[1]

[1]Osaka Kawasaki Rehabilitation Graduate School, Kaizuka, Japan

Objective: To investigate the relationship between community-dwelling elderly individuals with pre-frailty and appetite. Previous studies have shown an association between malnutrition and appetite, and nutritional intervention and exercise therapy are recommended to prevent pre-frailty; however, loss of appetite before nutritional intervention may not lead to improvement.
Methods: This cross-sectional study included 204 elderly individuals (151 females and 53 males age 74.1 ± 6.6 years old) aged ≥ 65 y, who underwent health check-ups in Kaizuka, Osaka between August and September 2023. The measurement items included are frailty and pre-frailty, appetite, eating habits, depressive tendency, cognitive function, attention function, and body composition. Statistical analysis robust and pre-frailty are grouped based on Fried et al.'s definition, and associations with assessment items were analyzed by univariate analysis. Binomial logistic regression analysis was performed to examine the independent associated factors, with items that showed significant differences, sex and age, and presence of pre-frailty as independent, control, and dependent variables, respectively. The significance level was set at 5%.
Results: Robust and pre-frailty was present in n = 99 (48.5%) and n = 105 (51.5%), respectively. Pre-frailty inpatients showed lower appetite, depressive tendency, and attention function, of which appetite (odds ratio [OR], 95%CI = 3.5 [1.5–8.2]) and depressive tendency (OR 95%CI = 5.8 [2.0–215.2]) are independently associated with pre-frailty.
Conclusion: We found independent associations between pre-frailty and appetite and depressive tendency of community-dwelling elderly individuals. Therefore, it was speculated that the presence of pre-frailty may be influenced by psycho-psychological decline and the resulting loss of appetite.

P1367
LOW DAILY PHYSICAL ACTIVITY IS AN IMPORTANT FACTOR FOR EARLY LOSS OF CORTICAL BONE MINERAL DENSITY

Y. Polyakova[1], E. Papichev[1], L. Seewordova[1], Y. Akhverdyan[1], B. Zavodovsky[1]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, Russia

Objective: When examining patients without significant therapeutic pathology, women under 60 years of age began to be increasingly identified with a predominant decrease in BMD in the proximal femur. Significant risk factors for decreased BMD in these patients include low physical activity and high social employment. We aimed to assess the incidence of decreased BMD of the proximal femur in women under 60 y of age in the absence of endocrine and rheumatic pathology.
Methods: A retrospective analysis of outpatient records of patients who were examined at the Center for Osteoporosis of the Federal

State Budgetary Institution «Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky», Volgograd, was carried out. Risk factors were re-analyzed in 30 patients under 60 years of age with a predominance of decreased BMD of the proximal femur over BMD of the lumbar vertebrae. BMD was determined by DXA using a Lunar DPX (GE) apparatus. BMD status was assessed using T and Z-score criteria in g/cm^2.

Results: Of the 30 women under 60 y of age with a predominant decrease in BMD in the proximal femur over the lumbar vertebrae, 29 use a personal car as a means of transportation in everyday life, 14 live in high-rise buildings and constantly use the elevator. Moreover, in all cases there is a more significant decrease in indicators for T(Z)Total. The incidence of decreased BMD in the lumbar spine was 67%, in the femoral neck 93.3%, and in the proximal femur 100%. In a statistical analysis of the average T-criterion values, the highest value was found in the lumbar vertebral bodies TL1-L4 = -1.22 $\pm$ 0.52, TNeck = -1.57 $\pm$ 0.44, the lowest in the proximal femur—TTotal =—1.74 $\pm$ 0.43 standard deviations, respectively.

Conclusion: Significant limitation of physical activity on the lower extremities, due to constant movement by car, regular use of the elevator, in the absence of additional physical activity, can be considered as a separate risk factor for a decrease in BMD of the proximal femur. Probably, the obtained results can be considered as a significant risk factor for the development of osteoporosis and hip fracture at a younger age.

P1368
BOLSTERING CARDIOPULMONARY, BALANCE AND ACTIVITIES OF DAILY LIVING FUNCTION USING DEEP-LEARNING PLATFORM FOR CEREBRAL PALSY

Y. S. An[1], C. H. Park[1], S. H. Min[1]

[1]Funrehab, Daejeon, South Korea

Adolescents with hemiplegic cerebral palsy undergo conventional physical therapy (CPT) to improve static and dynamic balance, activities of daily living (ADL) and cardiopulmonary function. However, during the COVID-19 pandemic, the primary problems associated with direct, labor-intensive hands-on therapy worsened. To overcome this problem, we developed an innovative deep learning-based rehabilitation application (DRA) to provide a motivational and chaffed platform for such individuals. We compared the effects of DRA and CPT on 6-min walking test (6 MWT), Borg rating of perceived exertion scale (RPE), Berg balance scale (BBS), functional ambulation category (FAC), and modified Barthel index (MBI) in adolescents with hemiplegic cerebral palsy. A convenience sample of 30 adolescents with hemiplegic cerebral palsy was randomized into either the DRA or CPT group. DRA and CPT were administered to the participants, with each session lasting 30 min and apportioned thrice a week for a total of four weeks. ANOVA was performed and the level of significance was set at $P < 0.05$. The analysis indicated that DRA showed therapeutic effects on 6 MWT, BBS, and MBI compared to CPT. Our results provide evidence that DRA can improve cardiopulmonary function, balance, and ADL more effectively than CPT in adolescents with hemiplegic cerebral palsy.

P1369
BOLSTERING PAIN, DISABILITY AND RESPIRATORY FUNCTION IN MUSCULOSKELTAL PAIN USING INTERACTION DEEP-LEARING MANAGEMENT PLATFROM

Y. S. An[1], S. H. Min[1], C. H. Park[1]

[1]Funrehab, Daejeon, South Korea

Low back pain impairment has a wide-ranging impact on both biological and psychosocial aspects. This study aimed to compare the effects of artificial intelligence–based self-back management with digital application physical therapy (APT) and conventional physical therapy (CPT) on back pain intensity, respiratory function, limited functional disability, and quality of life in 100 patients with low back pain. A convenience sample of 100 participants (mean age 35.5 $\pm$ 8.8 y; 20 females) was recruited and underwent either APT or CPT for 30 min sessions, three times a week over a 4-week period. The outcome measures included the (1) Oswestry disability index (ODI), (2) Quebec back pain disability scale (QUE), (3) Roland–Morris disability questionnaire (RMDQ), (4) numeric pain rating scale (NPRS), (5) short form-12 (SF-12), and (6) maximum inspiratory (MIP) and expiratory (MEP) pressures. Statistical analyses included ANOVA to determine intervention-related changes in these outcome variables. ANOVA revealed a positive effect on clinical outcome measures after 8 weeks of both APT and CPT. In conclusion, APT was a successful intervention for clinical outcome measures (ODI, RMDQ, and NPRS), maximum respiratory pressure (MIP and MEP), and quality of life (SF-12). Most importantly, APT demonstrated more positive effects on COVID-19 transmission risk, cost-effectiveness, accessibility, and real-time feedback than CPT. This study compared the effects of APT and CPT in patients with LBP. We demonstrated that APT was as effective as CPT in improving structure/functional impairment, activity limitation, and participation restriction domains.

P1370
HOME-BASED EXERCISE REDUCES FALLS IN COGNITIVELY FRAIL OLDER ADULTS WHO HAVE PREVIOUSLY FALLEN

R. S. Falck[1], C. L. Hsu[2], J. C. Davis[3], Y. S. Seo[1], J. Rice[1], E. Dao[1], L. Dian[4], K. Madden[4], D. A. Skelton[5], N. Parmar[4], W. L. Cook[4], K. M. Khan[6], T. Liu-Ambrose[1]

[1]Dept. of Physical Therapy, Faculty of Medicine, Univ. of British Columbia, Vancouver, Canada, [2]Dept. of Rehabilitation Sciences, Hong Kong Polytechnic Univ., Kowloon, Hong Kong SAR China, [3]Faculty of Management, Univ. of British Columbia-Okanagan Campus, Kelowna, Canada, [4]Dept. of Medicine, Division of Geriatric Medicine, Faculty of Medicine, Univ. of British Columbia, Vancouver, Canada, [5]Dept. of Physiotherapy and Paramedicine, Glasgow Caledonian Univ., Glasgow, UK, [6]Dept. of Family Practice, Faculty of Medicine, Univ. of British Columbia, Vancouver, Canada

Objective: Fragility hip fractures are one of the most serious consequences of falls amongst older adults with osteoporosis. Cognitive frailty, characterized by concurrent physical frailty and mild cognitive impairment, increases fall risk. Exercise is an evidence-based strategy to prevent falls. We examined the effects of home-based exercise on

subsequent falls amongst community-dwelling cognitively frail older adults who have previously fallen.
Methods: A sub-group analysis of a 12-month, single-blind, randomized controlled trial amongst 344 adults $\geq$ 70 y who had fallen in the past 12 months. Participants were randomized to either 12 months of home-based exercise (EX; n = 172) or usual care (CON; n = 172). In this sub analysis, we included 192 cognitively frail participants (EX = 93; CON = 99) with Short Physical Performance Battery (SPPB) scores $\leq$ 9/12 and Montreal Cognitive Assessment (MoCA) scores $<$ 26/30. Our primary outcome was falls rate based on self-reported falls over 12 months. Secondary outcomes were core components of cognitive frailty (i.e., SPPB and MoCA). We also explored whether adherence moderated the effect of EX on outcomes.
Results: At 12 months, falls rates were 35% lower in EX vs. CON (IRR = 0.65; p = 0.042). The mean monthly adherence was 45.5%. SPPB performance significantly improved amongst EX participants who completed $\geq$ 45.5% of EX sessions vs. those with completed $<$ 45.5% of sessions (estimated mean difference: 0.94; p = 0.022).
Conclusion: Exercise is a promising strategy for reducing subsequent falls in people with cognitive frailty. Greater exercise adherence improved physical function in this population.
Acknowledgements: Funding was by Canadian Institutes of Health Research. TLA is a Tier 1 Canada Research Chair. JCD is a Tier 2 Canada Research Chair. KM is the Allen M. McGavin Chair in Geriatric Medicine. RSF is a Michael Smith Health Research BC Postdoctoral Fellow.

P1371
EFFECT OF A HOME-BASED EXERCISE ON FALLS RISK IN COGNITIVELY IMPAIRED OLDER ADULTS POST HIP FRACTURE: A RANDOMIZED CONTROLLED TRIAL

Y. S. Seo[1], L. Dian[2], J. C. Davis[3], D. Tai[1], D. A. Jehu[4], P. Guy[5], D. M. Roffey[5], L. Lai[2], T. Liu-Ambrose[1]

[1]Dept. of Physical Therapy, Faculty of Medicine, Univ. of British Columbia, Vancouver, Canada, [2]Dept. of Medicine, Division of Geriatric Medicine, Faculty of Medicine, Univ. of British Columbia, Vancouver, Canada, [3]Faculty of Management, Univ. of British Columbia-Okanagan Campus, Kelowna, Canada, [4]Dept. of Community & Behavioural Health Sciences, Augusta Univ., Augusta, USA, [5]Dept. of Orthopaedics, Faculty of Medicine, Univ. of British Columbia, Vancouver, Canada

Objective: 95% of hip fractures (HF), one of the most serious consequences of osteoporosis, are caused by falls in older adults. HF intervention studies have largely excluded those with cognitive impairment. We examined the effect of a home-based program of progressive strength and balance training exercises in reducing falls risk amongst older adults with mild cognitive impairment (MCI) who sustained a fall-induced HF.
Methods: We conducted a 6-month single-blinded randomized controlled trial amongst 60 adults aged $\geq$ 65 years with MCI (i.e. Montreal Cognitive Assessment scores $<$ 26/30) who sustained a HF due to a non-syncopal fall in the past 12 months and were discharged home. Participants were randomized to: 1) a home-based exercise program delivered by a physical therapist in addition to standard of care provided by a geriatrician (EX; n = 30); or 2) standard of care alone (CON; n = 30). The primary outcome was falls risk as measured by the Physiological Profile Assessment (PPA). The PPA computes a standardized fall risk score (z-score) based on performance of 5 physiological domains (i.e. vision, proprioception, strength, reaction time and balance). We conducted an interim analysis of efficacy using analysis of covariance, adjusting for baseline PPA and relevant covariates.
Results: The mean age of the 60 participants was 79.5 y and 72% were females. 12/60 participants are currently in the trial and the last assessment will be in March 2024. Attrition to date is 21% (EX = 4; CON = 9). For the 34 participants (EX = 19; CON = 15) who completed the trial, falls risk was reduced in EX vs. CON at 6 months (p = 0.026; estimated mean difference: 0.74; 95%CI: 0.09–1.39).
Conclusion: Home-based progressive strength and balance training exercises show promise in reducing falls risk after a fall-induced HF amongst older adults with MCI.
Acknowledgements: TLA is a Tier 1 Canada Research Chair (CRC). JCD is a Tier 2 CRC. Funding was provided by Amgen to TLA.

P1372
SARCOPENIA RISK FACTOR FOR FALLS AND FRACTURES

Y. Safonova[1]

[1]North-Western State Medical Univ. named after I.I. Mechnikov, St. Petersburg, Russia

Objective: Association of falls and fractures with sarcopenia in older people.
Methods: The study involved 230 patients aged 65 years and older (mean age 74.0 $\pm$ 6.5 y) living in the community dwelling. The diagnosis of sarcopenia was consistent with the recommendations of the EWGSOP (2018).
Results: Sarcopenia was found in 28.7% of the elderly, severe sarcopenia in 21.3%. In sarcopenic patients, the frequency of falls over 12 months was higher than in non-sarcopenic patients (90.9 vs. 26.8%, $p < 0.001$). The risk of falls in sarcopenic patients was 2.07 (95%CI 1.86–2.30, $p < 0.001$) times, and in those with severe sarcopenia it was 3.02 (95%CI 1.79–5.11, $p < 0.001$) times is higher compared to non-sarcopenic patients. The incidence of fractures in sarcopenic patients was higher than in non-sarcopenic patients (37.7 vs. 26.7%, $p < 0.01$). In people with sarcopenia, the risk of fracture was 1.52 (95%CI 1.01–2.28; p = 0.049) times, and hip fracture was 2.28 (95%CI 1.28–4.05; p = 0.003) times higher than in non-sarcopenic patients.
Conclusion: The incidence of falls and fractures is higher in sarcopenic patients than in non-sarcopenic patients.

P1373
LINKS TO USEFUL RESOURCES INCREASE EFFECTIVENESS OF THERAPY FOR DISEASES OF THE MUSCULOSKELETAL SYSTEM

Y. U. Polyakova[1], L. Seewordova[1], Y. Akhverdyan[1], E. Papichev[1], B. Zavodovsky[1]

[1]Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovsky, Volgograd, Russia

Objective: Treatment of musculoskeletal disorders cannot be considered separately from lifestyle modification. To correct physical activity and normalize nutrition, additional consultations with specialists are required. Distributing information leaflets or links to Internet resources can be considered as assistance in solving the task. Aim: increase the effectiveness of non-drug therapy (NT) by introducing online resources during the appointment.
Methods: Monitoring of effective access to information resources was carried out under various modes of presenting information during reception. Group 1 (100 initial patients) was given a leaflet with examples of exercises and a leaflet with dietary recommendations at the appointment. The 2nd group (100 patients) was told about the benefits of exercise and proper nutrition, with an emphasis on the fact

that the references were in the doctor's report. The 3rd group (100 patients) received a link on the doctor's computer at the appointment and was told about the benefits of physical therapy and proper nutrition. The 4th group (100 patients) were shown 2–4 exercises at the appointment, involving the patient in their implementation, and were given a leaflet or a link to a video and recommendations on proper nutrition.

Results: At the follow-up appointment, it was revealed that, regardless of the information provided, almost 80% of patients with gout complied with dietary recommendations to one degree or another, at least in the first month of observation. The calculation of calcium intake in 9% was carried out by patients who were given a leaflet, in 23% of cases—by patients who were given a link to the IOF Calcium Calculator and in 78% of cases, if the doctor visited the site during the appointment and showed how the intake calculation was carried out calcium. Completion of the exercises was 82% if the exercises were performed together with the doctor during the appointment, 57% when opening a link to a site with a video (лечебная гимнастика—РАОП; здоровьесуставов.рф/video) and 17% when handing out leaflets with exercises.

Conclusion: Implementation of NT recommendations is highly dependent on the presentation of information. The best result is achieved when the patient is involved in the implementation of recommendations directly at the doctor's appointment.

P1374
EFFICIENT REVERSAL OF DISEASE PHENOTYPES OF GMPPB-DYSTROGLYCANOPATHY WITH THE ACTIVATION OF WNT SIGNALING PATHWAY AND AAV GENE THERAPY

Z. W. Fu[1], Y. W. Wang[2]

[1]Fudan Univ., Shanghai, China

It has been found lately that diverse forms of congenital muscular dystrophy are congenital disorders of glycosylation, composing a clinically heterogeneous group of disorders collectively referred to as dystroglycanopathy (DGP). Recently, clinical cases have been reported in patients with muscular dystrophy with mutations in guanosine diphosphate mannose (GDP—mannose) pyrophosphorylase B (GMPPB), most of which are of compound mutations. However, it is not clear if and how GMPPB mutations or variations in GDP-mannose levels directly contribute to muscular dystrophy, nor did the molecular mechanisms affecting disease progression being identified. To establish the role of GMPPB in muscular dystrophy, we constructed GMPPB mutant mouse lines and found that two of these alterations are lethal in the homozygous forms. Besides, a heterozygous GMPPB mouse line exhibited reduced muscle strength, decreased locomotor ability, elevated creatine kinase levels and increased number of central nuclei. We further show that the ability of muscle regeneration in these mice is decreased post muscle injury. Reduced myotube diameter and fusion index are evident in GMPPB mutant myoblasts and muscle stem cells isolated from heterozygous mice upon induction of muscle differentiation. To identify the pathways mediating impaired muscle development in GMPPB-deficient contexts, we conducted genomic studies and found that Wnt/β-catenin pathway undergoes significant alterations. Ectopic activation of Wnt signaling alleviates the block of muscle differentiation in GMPPB-deficient cells. Additionally, the muscle regeneration post muscle injury is restored in vivo by pharmacological activation of Wnt signaling, as well as by AAV gene replacement therapy. Overall, these findings provide direct evidence supporting that GMPPB loss-of-function leads to onset of dystroglycanopathy diseases, and further extend understanding of the role of GMPPB in the disease progression. Gene therapy and Wnt pathway activating agents are potential effective intervention routes for these pathological conditions and further preclinical DGP studies are warranted.

P1375
METHOD FOR ASSESSING THE PROBABILITY OF DEVELOPING PSORIATIC ARTHRITIS IN PATIENTS WITH PSORIASIS

Y. Y. Liashko[1]

[1]Institute of Advanced Training and Retraining of Healthcare Personnel of Belarusian State Medical Univ., Minsk, Belarus

Objective: To assess the probability of developing PsA in patients with psoriasis based on inflammatory changes in synovial-entheseal structures.

Methods: The study included 139 subjects aged 18–55 y, divided into three groups: patients diagnosed with PsA—52; patients with skin psoriasis and without signs of PsA according to PEST criteria—56 and control healthy group—30. In patients of groups I and II, the following signs were assessed: Nail Psoriasis Severity Index (NAPSI), body surface area (BSA), Psoriasis Area Severity Index (PASI). Activity indices were calculated to evaluate disease activity in group: DAS28, ASDAS, BASDAI, functional activity indices: BASFI. All patients underwent ultrasound examination of 14 entheses: 7 on each side. The following were assessed: disruption of the fibrillar pattern, presence of enthesophyte and erosion of the attachment site, PD activity during enthesis at the insertion site and 2 mm from it, tendon thickness in a longitudinal section at a distance of 5 mm from the insertion site, presence/absence of bursitis in 4 periarticular bursae at both sides.

Results: To predict the probability of developing PsA, the tendon index TI was developed as the ratio of the difference between the arithmetic mean of the thickness of 12 tendons and the arithmetic mean of the thickness of the control tendon to the arithmetic mean of the thickness of the control tendon. The TI threshold value, above which thickening may be a sign of PsA, was determined by ROC analysis. AUC was 0.916, sensitivity 81.6%, specificity 76.9%. Multiple logistic regression analysis was performed to identify the relationship between the probability of patients developing PsA and the characteristics measured in them. Significant signs are: TI, bursitis, BSA, PASI. AUC was 0.876, sensitivity 80.77%, specificity 85.71%, threshold criterion 0.604.

Conclusion: The developed model for assessing the probability of developing PsA in patients with psoriasis includes the developed TI as one of the prognostic signs. The model makes it possible to predict whether the examined patient belongs to either the group of patients with the subclinical phase of PsA, or to the group with isolated skin manifestations.

P1376
HEMATOPOIETIC AUTOPHAGY DEFECT CONTRIBUTES TO BONE LOSS

Y. Y. Yuan[1], Y. J. X. Xu[2], J. H. L. Lin[1]

[1]Arthritis Clinical and Research Center, Peking Univ. People's Hospital, Beijing, [2]Dept. of Orthopaedics, the Second Affiliated Hospital of Soochow Univ., Suzhou, China

Objective: Hematopoietic disorders are known to increase the risk of complications such as osteoporosis. However, a direct link between hematopoietic cellular disorders and osteoporosis has been elusive. Here, we demonstrate that the deterioration of hematopoietic autophagy is coupled with osteoporosis in humans and animal models.

Methods: (1) In clinical research, physical examination results of 4979 healthy individuals were analyzed for blood count and BMD. Femur or tibia-derived bone marrow were obtained from young normal BMD patient (BMD > -1.0, age < 40 y) and aged osteoporosis patients(BMD < -2.5, age > 60 y). Bone marrow monocytes were stained by CD34 and CD45 antibody. LC3 expression of bone marrow hematopoietic cells were measured by ImageStream. (2) In animal research, bone marrow was collected from ovariectomized mice and control mice. The proportion and cell apoptosis of hematopoietic stem and progenitor cells were measured by flow cytometry. P62 and LC3 expression of hematopoietic stem and progenitor cells were detected by western blotting. Hematopoietic stem and progenitor cells autophagy function was observed by image flow cytometry double staining. (3) Then we performed mice deleted Atg7 gene, using an Vav-Cre transgene, which targets cells at bone marrow hematopoietic cells ($Atg7^{f/f}$;Vav-Cre); the control group was $Atg7^{f/f}$ genomic DNA from skin samples of harvested mice were used to genotype animals by PCR. Bone marrow hematopoiesis cells LC3-I and LC3-II protein expression were measured to confirm autophagy disordered. Mice were euthanized at 8 weeks. Calcein of 30 mg/kg was injected 7 days and 2 d before harvested. Tibiae and femora were collected. μCT was performed for BMD, cortical thickness and trabecular bone quantification. Bone trabecular was observed by electron microscopic images. Harvested bone tissues were sectioned for hematoxylin and eosin (H&E), tartrate-resistant acid phosphatase (TRAP), Collagen1, and osteocalcin staining. Osteoblasts and osteoclasts were quantified for histomorphometry. Phalloidin staining of action was performed on tibia for immunofluorescence. Femora were tested in 3-point bending for bone biomechanical properties. Skeleton samples were stained by Alcian blue solution and Alizarin red S solution. Bone tissue was observed by scanning electron microscope. (4) $Atg7^{f/f}$;Vav-iCre bone tissue was collected for TMT labeled proteome analysis. Western blot was used to verified the proteome results. (5) $Atg7^{f/f}$;Vav-iCre tibia CD31hiEMCNhi vessel was observed by immunofluorescence. mRNA of vessels metabolism was measured.

Results: (1) Red blood cell count was reduced in both male and female osteoporotic patients. Human hematopoietic stem progenitor cells (CD34 + CD45 +) LC3 protein was inhibited in aged people, which related to decreased autophagy. (2) The proportion of hematopoietic stem and progenitor cells was increased in ovariectomized mice. However, the apoptosis of hematopoietic stem and progenitor cells was also increased. Bone marrow hematopoietic stem cells displayed a reduced basal autophagy activity in ovariectomized mice. Hematopoietic stem cells frequency in hematopoietic stem and progenitor cells was also reduced in ovariectomized mice. (3) Deletion of Atg7 in hematopoietic system caused low bone mass. $Atg7^{f/f}$;Vav-iCre mice BMD was lower. μCT analysis revealed that trabecular number, bone volume/tissue volume, cortical thickness were decreased. Quantification of tetracycline labeling showed reduced mineralized surface in $Atg7^{f/f}$;Vav-iCre mice, which resulted in a low bone formation rate. The H&E staining showed $Atg7^{f/f}$;Vav-iCre mice trabecular degeneration and more fat tissue. The TRAP staining showed there was more abundance and activity of osteoclasts in $Atg7^{f/f}$;Vav-iCre mice. Scanning electron microscope depicted trabecular microstructure destruction. There is no size difference in skeleton staining. The absence of Atg7 in hematopoietic resulted in weak bone biomechanical strength properties. (4) Integrative proteomics functional enrichment of differentially quantified proteins showed $Atg7^{f/f}$;Vav-Cre mice bone tissue immune response upregulated while skeletal system morphogenesis and development downregulated. STAT1, STAT3 and p38 in Th17 cell differentiation were up regulated. Collagen1 in ECM-Receptor interaction was downregulated. immunohistochemical of bone tissue verified collagen1 protein expression decreased. (5) Bone CD31hiEMCNhi vessel was inhibited in $Atg7^{-/-}$ mice. RT-PCR showed Vegfa was downregulated in $Atg7^{-/-}$ mice.

Conclusion: Hematopoietic autophagy defect causes disruption of CD31hiEMCNhi vessel via inhibition of Vegfa, resulting in bone loss. We therefore propose that hematopoietic autophagy is required for the integrity of H vessels that bridge blood and bone cells and that its deterioration leads to osteoporosis.

P1377
COMPARISON BETWEEN AUTOLOGOUS BONE AND BONE MORPHOGENETIC PROTEIN 2 IN BONE REGENERATION USING NEW MASQUELET TECHNIQUE RABBIT MODEL

Y. Yamamoto[1], T. Fukui[1], K. Oe[1], Y. Kumabe[1], K. Sawauchi[1], R. Yoshikawa[1], K. Takase[1], R. Nishida[1], H. Kondo[1], T. Niikura[2], R. Kuroda[1]

[1]Kobe Univ. Graduate School of Medicine/Dept. of Orthopaedic Surgery/Kobe Univ. Hospital/Japan, Kobe, [2]Hyogo Prefectural Nishinomiya Hospital/Dept. of Orthopaedic Surgery/Japan, Nishinomiya, Japan

Objective: The Masquelet technique is a relatively new treatment for critical-sized bone defects. Although good results have been reported, pain and bleeding associated with autologous bone grafting are negative aspects to the patients. Recently, using bone morphogenetic protein 2 (BMP-2) as a noninvasive bone regeneration therapy has attracted attention, but its difference with autologous bone grafting is unknown. In this study, we created a new Masquelet model of rabbit femoral bone defects and compared the bone regenerative effects between autologous bone and β-tricalcium phosphate (β-TCP) granules containing BMP-2.

Methods: 24-week-old New Zealand white rabbits were used. In the first operation, a 20-mm defect was created in the femur, internally fixed with a locking plate and screws, and filled with bone cement. In the second operation, the bone cement was removed after 4 weeks and formation of an induced membrane around the defect was confirmed. The autologous bone graft group (n = 12) and BMP-2 group (n = 5) were filled with the bilateral iliac bones and β-TCP containing BMP-2, respectively. At 12 weeks after the second operation, bone union and regeneration were evaluated by radiologically (modified Lane–Sandhu radiographic scoring system), histologically, and biomechanically by three-point bending tests and compared.

Results: Radiological assessment using X-rays showed that both groups achieved bone union; therefore, a new Masquelet technique model of rabbit femoral defects could be created successfully. Additionally, the BMP-2 group had better bone union, although there was no significant difference between the two groups. Histological evaluation showed good bone regeneration in both groups. Biomechanical evaluation showed no significant differences in ultimate stress, extrinsic stiffness, and failure energy, but they tended to be higher in the autologous bone graft group.

Conclusion: A new Masquelet technique model of rabbit femoral bone defects was created successfully. Although the BMP-2 group tended to be mechanically weaker than the autologous bone graft group, the results suggest that bone regeneration treatment is equiv-

alent to autologous bone graft and may eliminate the need for an autograft.

P1378
STUDY ON THE MECHANISM OF INHIBITING TITANIUM PARTICLE-INDUCED OSTEOLYSIS BY ARC THROUGH INFLAMMATORY FACTORS AND GUT MICROBIOTA

L. Tang[1], Y. Zhang[1], Y. Zhou[1], Q. Dong[2], P. Sun[1]

[1]The First Affiliated Hospital of Guangdong Pharmaceutical Univ., Guangzhou, [2]Yunfu Hospital of Traditional Chinese Medicine, Yunfu, China

Objective: To investigate the mechanism of Arctiin (ARC) inhibiting titanium particle-induced osteolysis around the skull in mice based on the changes of inflammatory factors and gut microbiota.
Methods: Twenty 7-week-old, female C57BL/6 J mice were randomly divided into four groups (5 mice for each group): blank group (SHAM), model group (Vehicle), ARC low-dose group (L-ARC) and ARC high-dose group (H-ARC). L-ARC and H-ARC groups were intraperitoneally injected with ARC 5 mg/kg/d and 10 mg/kg/d respectively on the basis of Vehicle, and SHAM and Vehicle groups were intraperitoneally injected with the same dose of normal saline. After treatment for 2 weeks, the following parameters of skulls: BMD, BV/TV, Tb.N, BS/BV, Tb.Sp and Tb.Th were detected by μCT. The levels of TRACP5b, CTX, OCN, IL-6, TNF-α and IL-10 in serum samples were detected by ELISA. 16S rRNA sequencing was used to analyze the structure and abundance of gut microbiota.
Results: BMD, BV/TV, Tb.N, BS/BV, Tb.Th, OCN and IL-10 were significantly decreased in Vehicle group compared with SHAM group ($P < 0.01$, $P < 0.05$); Tb.Sp, TRACP5b, CTX, IL-6 and TNFα were significantly increased ($P < 0.05$, $P < 0.01$). Compared with Vehicle group, BMD, BV/TV, Tb.N, BS/BV, Tb.Th and OCN in L-ARC group had an increasing trend ($P > 0.05$), Tb.Sp, TRACP5b and CTX had a decreasing trend ($P > 0.05$), TNFα and IL-6 were significantly decreased ($P < 0.05$), and IL-10 was significantly increased ($P < 0.05$). Compared with Vehicle group, the levels of BMD, BV/TV, Tb.N and IL-10 in H-ARC group were significantly increased ($P < 0.05$, $P < 0.01$), the levels of TRACP5b, CTX, IL-6 and TNFα were significantly decreased ($P < 0.05$, $P < 0.01$), while the levels of BS/BV, Tb.Th and OCN had an increasing trend ($P > 0.05$), Tb.Sp had a decreasing trend ($P > 0.05$). At the phylum level, compared with SHAM group, F/B ratio had an increasing trend in Vehicle group ($P > 0.05$); However, compared with Vehicle group, the F/B ratio of L-ARC and H-ARC groups were significantly decreased ($P < 0.01$). At the genus level, compared with SHAM group, the abundance of Ileibacterium in Vehicle group had an increasing trend ($P > 0.05$), the abundance of Prevotellaceae_UCG-001 and Rikenellaceae_RC9_gut_group in Vehicle group had a decreasing trend ($P > 0.05$). While compared with Vehicle group, the abundance of Ileibacterium in L-ARC and H-ARC groups were significantly decreased ($P < 0.05$); the abundance of Prevotellaceae_UCG-001 and Rikenellaceae_RC9_gut_group in L-ARC and H-ARC were significantly increased ($P < 0.05$).
Conclusion: ARC can inhibit titanium particle-induced osteolysis in mice by suppressing inflammation and modulating the structure of gut microbiota in a dose-dependent manner.
Acknowledgements: Financial support was received for the research, authorship and publication of this article. This work was supported by grants from the Science and Technology Planning Project of Yunfu, Guangdong Province, China [No. 2020A090402].

P1379
ABLATION OF VITAMIN D RECEPTOR INDUCED FIBROSIS OF SKELETAL MUSCLE IN AT2R(-/-) MICE

Y.-D. Wei[1], Y.-X. Guo[1], S.-H. Xia[1], Z.-H. Jia[2], Y. Zhang[1]

[1]Spine Disease Research Institute, Longhua Hospital, Shanghai Univ. of Traditional Chinese Medicine, Shanghai, [2]National Key Laboratory for Innovation and Transformation of Luobing Theory, Shijiazhuang, China

Objective: To investigate the potential regulatory role of angiotensin type 2 receptor (AT2R) and vitamin D receptor (VDR) on fibrosis of skeletal muscle in mice.
Methods: Grip strength tests were performed on 16-week-old wild-type (WT) and AT2R(-/-) mice, and on 12-week-old AT2R(-/-) mice and AT2R(-/-)/VDR(-/-) (DKO) mice. The wet weight ratio and the molecular expressions of fibrotic and profibrotic factors were measured in mice hindlimb muscles.
Results: 1. As compared to WT mice, there was no significant difference in the wet weight ratio of the hindlimb skeletal muscles of AT2R(-/-) mice, while, the mRNA expression of fibronectin (FN), CTGF, VEGF ($P < 0.05$) and myostatin (MSTN) displayed the decreasing trend. The protein expression of TGFβ and Col-IV was significantly downregulated ($P < 0.05$) associated with a marked reduce in content of MSTN ($P < 0.05$) in skeletal muscle of AT2R(-/-) mice. 2. In a comparison with AT2R(-/-) mice, the DKO mice showed the significant upregulation ($P < 0.05$) in protein expression of the fibrotic indicators like Col-IV, TGF-ß and VEGF, along with a profound elevation in protein expression of renin ($P < 0.05$). The immunofluorescence detection indicated that the relative fluorescence intensity and the fluorescence area of FN were both enhanced in the gastrocnemius muscle of DKO mice ($P < 0.05$).
Conclusion: The knockout of AT2R gene might alleviate the degree of muscle fibrosis in mice. Importantly, VDR ablation exacerbated skeletal muscle fibrosis of AT2R knockout mice, which was, at least partially, attributed to the over-activity of renin-angiotensin system that could lead to tissue fibrosis.
Acknowledgments: This study was supported in part by National Key R&D Program from Ministry of Science and Technology of China (2023YFC3504305), and National Natural Science Foundation of China (82,074,468).

P1380
ELDECALCITOL PROTECTS MUSCLE TISSUE OF MICE FROM FIBROSIS ASSOCIATED WITH SENESCENCE

Y.-X. Guo[1], X.-M. Li[2], Z.-Y. Zhang[3], Z.-H. Jia[4], Y. Zhang[1]

[1]Spine Disease Research Institute, Longhua Hospital, Shanghai Univ. of Traditional Chinese Medicine, Shanghai, [2]Dept. of Orthopaedics, Cangzhou Hospital of Integrated TCM-WM, Cangzhou, [3]Dept. of Endocrine, Cangzhou Hospital of Integrated TCM-WM, Cangzhou, [4]National Key Laboratory for Innovation and Transformation of Luobing Theory, Shijiazhuang, China

Objective: Our early studies explored the key roles of vitamin D receptor (VDR) in protecting tissue fibrosis using VDR(-/-) mice and VDR agonists. Recently we published a paper demonstrating that vitamin D/VDR signaling ameliorated skeletal muscle atrophy by suppressing renin-angiotensin system (RAS). The present study aimed to investigate the preservation of VDR agonist eldecalcitol against muscle fibrosis associated with aging and the underlying mechanism.
Methods: The male C57BL/6 mice were divided into 3 groups ($n = 10$ in each group): mice in normal control treated daily with vehicle, mice in aging model group treated daily with D-gal (300 mg/kg, i.p., one classical inducer for aging) for 8 weeks, thereafter mice

in model group and in treatment group were treated with D-gal or combined with intraperitoneal injection (3 times per week) of eldecalcitol (0.05 μg/kg) for subsequent 8 weeks. The frozen slides of gastrocnemius were stained with H&E and sirius. The activity of senescence-associated-β-galactosidase (SA-β-Gal) was measured by staining kit. Immunoblotting was used to detect expressions of fibrotic factors and those involved in angiotensin II (Ang II, active peptide within RAS)/TGFß/ß-catenin pathway.

Results: Eldecalcitol (ELD) enhanced muscle index of tibialis anterior and gastrocnemius, grip strength and weight-loaded swimming time of mice with D-gal-induced senescence. ELISA detections showed the reduction and elevation of myostatin and irisin, respectively, in serum of ELD-treated mice in a comparison with those in model group. Histological staining demonstrated the repression of ELD on the decrease in area of myofibers and the accumulation in extracellular matrix as well as that ELD profoundly reduced the SA-β-Gal-positive area among muscle fibers. Molecular measurements demonstrated that ELD inhibited the upregulation in protein expression of fibrotic factors including type I and type III collagens, fibronectin, and profibrotic signaling factors including renin, Ang II, TGFß, ß-catenin, and tissue inhibitors of metalloproteinase (TIMP)-1 and 2 in muscle of D-gal-evoked aging mice.

Conclusion: VDR agonist eldecalcitol displayed beneficial effects on skeletal muscle function and strength in mice associated with D-gal-induced senescence by alleviating muscular dystrophy and fibrosis via suppressing Ang II/ TGFß/ß-catenin pathway.

Acknowledgments: This study was supported in part by National Key R&D Program from Ministry of Science and Technology of China (2023YFC3504305), National Natural Science Foundation of China (82,074,468), and Chugai Pharma China Co., Ltd.

P1381
TARGETING THE RANK/RANKL/OPG BONE PATHWAY AS TREATMENT STRATEGY FOR CONGENITAL MUSCULAR DYSTROPHY TYPE 1A

Z. Bouredji[1], A. Argaw[1], J. Frenette[1]

[1]Centre Hospitalier Universitaire de Québec, Centre de Recherche du Centre Hospitalier de l'Université Laval (CRCHUQ-CHUL), Axe Neurosciences, Université Laval., Quebec City, QC, Canada

Objective: Congenital muscular dystrophy type 1A (CMD1A) is a lethal genetic neuromuscular disease caused by mutations in the LAMA2 gene that encodes the laminin α2 subunit, a structural protein ensuring muscle integrity during contractions. A large proportion of the children affected by CMD1A does not reach adolescence. Dystrophic muscles undergo cycles of degeneration and regeneration combined with chronic inflammation and an irreversible fibrosis. Several studies have shown that bone and muscle loss occur simultaneously in several neuromuscular diseases. Our team hypothesized that the RANK/RANKL/OPG system, the main regulator of bone remodeling, plays a key role in bone-muscle crosstalk. The interaction between RANK and its ligand RANKL is responsible for bone resorption, while osteoprotegerin (OPG) acts as a soluble RANKL receptor inhibits bone breakdown. We previously showed that a 10-d treatment with full-length OPG fused to a Fc fragment (FL-OPG- Fc) restored muscle function in mdx mice, and one-month treatment with anti-RANKL increased dystrophic bone and muscle functions. Our recent work also showed that RANKL neutralization modulated NF-κB activation and prevented dystrophic hearts from hypertrophy. The present study investigated whether FL-OPG-Fc or anti-RANKL protect skeletal muscle and bone in CMD1A.

Methods: We tested the effects of these treatments in male dy^{2J}/dy^{2J} mice (CMD1A mouse model), a more severe and genetically different dystrophic mice model. Four weeks old dy^{2J}/dy^{2J} mice received either FL-OPG-Fc [1 mg/kg/d] for 10 days or an anti-RANKL [4 mg/kg/3d] for 28 d. The contractile properties of slow and fast twitch skeletal muscles and the mechanical bone properties of tibiae were assessed ex vivo.

Results: Our results show that acute treatment with FL-OPG-Fc significantly improves the absolute and specific strength of dystrophic skeletal muscles. Although to a lesser extent, anti-RANKL treatment also improves dystrophic skeletal muscle force. Noteworthy, dy^{2J}/dy^{2J} mice display bone weakness and prolonged treatment with anti-RANKL improves bone stiffness and ultimate load. FL-OPG-Fc seems to be more efficient than the anti-RANKL in protecting skeletal muscles, suggesting that FL-OPG-Fc may also act independently of RANKL inhibition.

Conclusion: Our results open potentially new clinical applications for the protection of skeletal muscles and bones in CMD1A.

P1382
CORRELATION BETWEEN BMD AND SHORT STATURE IN THALASSEMIA MAJOR PATIENTS

Z. Hamidi[1], M. R. Mohajeri-Tehrani[1], B. Larijani[1]

[1]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran Univ. of Medical Sciences, Tehran, Iran

Objective: Thalassemias are the most prevalent monogenic diseases in the world. Beta thalassemia major type features serious anemia that requires continuous lifesaving blood transfusions. It is endemic in Iran. Short stature is a common problem in these patients. There are different factors that cause shortening of spine. Pathological macro and micro-fractures due to low BMD that is also a common complication in thalassemia, are named as risk factor. We tested this relationship in Iranian thalassemia major children. For better understanding of association of BMD and short stature in our pediatric patients, we also assessed the correlation of shortness with BMAD (bone mineral apparent density), an adjusted form of BMD in children.

Methods: The participants in this study were 110 β-thalassemia major girls and boys aged 3–18 y. They were referred to BMD department of Endocrinology and Metabolism Research Institute of Tehran University of Medical Sciences. A medical history obtained about any drug or disease that affects BMD. No one was a current or chronic user of systemic steroids. Thalassemics with major risk factor for osteoporosis omitted from this study. BMD of femoral neck and spine L2-L4, measured by one DXA machine (Hologic Discovery) and by one operator. Estimated volumetric BMAD was calculated for the lumbar spine (LSBMAD) and femoral neck (FNBMAD). Continuous variables were summarized as means, standard deviations (SDs), and ranges. Categorical variables were summarized as simple percentages. The independent-samples t-test procedure was used for comparison of means of the two groups.

Results: Mean age of patients was 9.6 ± 4.3 y/o. Mean height was 130 ± 21. From 110 participants, 37 were females. Short stature prevalence found 13%. Mean of femoral BMD and BMAD, spinal BMD and BMAD was 0.579 ± 0.134 g/cm^2, 0.162 ± 0.096 g/cm^3, 0.563 ± 0.118 g/cm^2 and 0.107 ± 0.015 g/cm^3, respectively. BMD and BMAD of spinal and femoral regions were not significantly different in short stature in comparison to height patients.

Conclusion: BMD in absolute form and in adjusted form (BMAD), showed no significant correlation with short stature in thalassemia major children. We can conclude that low BMD has no association with short stature in these patients.

P1383
RELATIONSHIP BETWEEN VITAMIN D RECEPTOR GENE POLYMORPHISM (TAQI) AND VITD-TOTAL LEVEL IN POSTMENOPAUSAL WOMEN OF EASTERN SLOVAKIA

M. Mydlárová Blaščáková[1], Z. Lörinczová[2], S. Žiláková[1], K. Kubalová[1], G. Sabolová[1], L. Mikulová[3], S. Dubecká[4]

[1]Dept. of Biology, Faculty of Humanities and Natural Sciences, Univ. of Prešov, Prešov, [2]Osteocentre, AGEL Hospital Košice-Šaca, Košice-Šaca, [3]Dept. of Technical Disciplines in Health Care, Faculty of Health Care, Univ. of Prešov, Prešov, [4] V. Internal Clinic, Faculty of Medicine of the Univ. of Comenius and Univ. Hospital Bratislava-Ružinov, Bratislava, Slovakia

Objective: Osteoporosis is a polygenic and multifactorial disease characterized by an increased risk of fractures, reduced BMD. Genetic and environmental factors play a key role in the etiology of osteoporosis. The vitamin D receptor gene (VDR) is an important candidate gene for the modification of BMD levels and the development of osteoporosis. Several polymorphic variants (ApaI, BsmI, FokI, TaqI, Cdx2) have been identified in the VDR gene, which may lead to changes in the protein sequence or affect the degree of gene expression, thus contributing to the development of osteoporosis. In our study we focused on the molecular- genetic analysis of polymorphic variant of the TaqI VDR gene and its association with the vitamin D-total level in postmenopausal women from eastern Slovakia.
Methods: The study population consisted of 299 postmenopausal women who were divided into three groups based on densitometric examination and medical screening: control group (CG = 68), osteopenia (OPE = 130), osteoporosis (OPO = 101). A peripheral blood sample was used for molecular genetic analysis, which was collected in S-Monovette tubes (K_3EDTA). DNA isolation was carried out according to a standard protocol using the commercial NucleoSpin Blood kit (Macherey–Nagel, Germany). Genotyping of the TaqI (rs731236) polymorphism of the VDR gene was performed by real-time PCR, using the TaqMan probe and the StepOne Real-Time PCR system (Applied Biosystems, USA). Biochemical analysis of VITD-total was performed in blood serum using Cobas e411 analyzer (Roche, Japan).
Results: Using chi-square test, we did not detect statistically significant difference in the representation of TaqI VDR gene polymorphism genotypes between the monitored groups of women with osteoporosis ($\chi^2 = 2.485$, $p = 0.647$). When comparing the values multiple times, through the analysis of variance, we found a statistically significant difference in the biochemical parameter VITD-total between all monitored groups of women in the genotypes: AA ($p < 0.05$), AG ($p < 0.01$) and GG ($p < 0.05$).
Conclusion: Women diagnosed with osteoporosis with at least one minor G allele had the lowest VITD-total values. This study expand knowledge about the genetic variability of the TaqI VDR gene polymorphism in the female population of eastern.

P1384
ENHANCING QUALITY OF CARE FOR PATIENTS WITH HIP FRACTURES AND PREVENTION OF INPATIENT FALLS WITHIN THE UK USING DATA DRIVEN FEEDBACK FROM NATIONAL AUDITS: RESULTS OF A VIRTUAL QUALITY IMPROVEMENT COLLABORATIVE

Z. Mohsin[1], L. Thomas[2], C. Cormack[2], R. Dickinson[2], J. Evans[2], S. Nisar[2], F. Roberts[2], S. Doyle[2], L. Quinney[2], A. Smith[2], K. Whitehead[2], J. Whitney[2], A. Johansen[2], J. Dean[2], B. Wiles[2], S. Nedungayil[2], M. K. Javaid[1]

[1]Univ. of Oxford, [2]Royal College of Physicians, London, UK

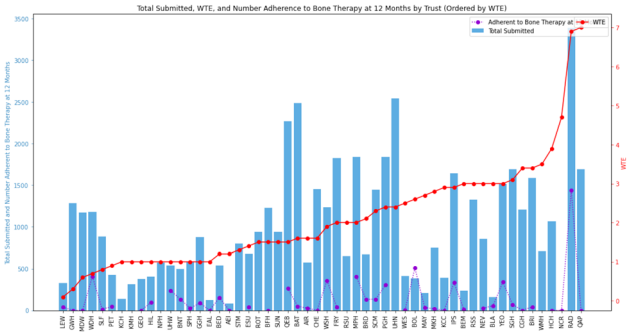
Objective: The UK healthcare system faces the significant burden of managing approximately 75,000 hip fractures and 250,000 inpatient falls annually. Quality Improvement (QI) initiatives offer a means to enhance care delivery. This study reports on a pilot virtual collaborative by the Falls and Fragility Fracture Audit Programme (FFFAP) aimed at refining inpatient fall prevention and hip fracture management.
Methods: Utilising the Institute for Healthcare Improvement (IHI) model, a virtual training collaborative was deployed over 11 months for 9 healthcare professional teams. The program's impact was measured via pre- and post-intervention questionnaires, analysed against Moore's outcomes.
Results: The intervention led to all teams exhibiting actionable learning and attaining level 5 in Moore's outcome framework, heightened motivation, improved team dynamics, and better interteam collaboration. Notably, 6 teams completed a QI project, with two achieving substantial improvements. Importantly, all initiatives prioritised patient engagement and a patient-centric design. However, none of the sites achieved their stated aims.
Conclusion: The collaborative training notably advanced the expertise and teamwork of healthcare professionals. However, further work is required to study the causes of lack of translation of quality improvement measures into improvement in patient outcomes.

P1385
DO FRACTURE LIAISON SERVICE (FLS) STAFFING LEVELS PREDICT FLS SERVICE PERFORMANCE?

Z. Mohsin[1], R. Shrestha[1], B. Wiles[2], C. Cockill[3], R. Pinedo-Villanueva[1], A. Johansen[2], M. Sanchez[1], M. K. Javaid[1]

[1]Univ. of Oxford, London, [2]Royal College of Physicians, London, [3]Yeovil District Hospital, Yeovil, UK.

Objective: While FLSs are widely recommended to deliver secondary fracture prevention, staffing levels vary considerably between services. This is important because staffing is a major cost for an FLS. We examined the relationships between whole time equivalent (WTE) staffing levels and clinical outcomes.
Methods: We used data from the UK FLS Database (FLS-DB) 2021 Organisational Data and FLS-DB 2021 Clinical Data and combined WTE of nurse and administrator time for each FLS. WTE were compared to number of patient records submitted and adherence to bone therapy at 12 months.
Results: There was a positive correlation between increased WTE and total cases submitted ($r = 0.43$, $p = 0.004$) as well as 12-month patient adherence to bone protective treatment at 12 months ($r = 0.46$, $p = 0.002$) (Figure). However, removing an influential outlier from the data (by Robust Anomaly Detection) led to both correlations becoming not significant (total cases submitted, $r = 0.26$, $p = 0.1$, and adherence to bone protective treatment at 12 months, $r = 0.13$, $p = 0.4$).



Conclusion: While staff levels in FLSs are a key driver of FLS costs, they do not directly correlate with several key clinical outcomes. This finding suggests that factors beyond staffing levels predict FLS performance. Future research is needed to explore the relationship between FLS staffing and performance.

P1386
REPRESENTATION AND IMPACT OF NEWS MEDIA MESSAGES ABOUT OSTEOPOROSIS AND ITS TREATMENT: A MULTI-METHOD STUDY WITH RECOMMENDATIONS FOR IMPROVEMENT

R. Jones[1], C. Jinks[1], S. Holohan[2], Z. Paskins[1]

[1]Keele Univ., School of Medicine, [2]Keele Univ., School of Social, Political and Global Studies, Newcastle, UK

Objective: To explore (i) representations of osteoporosis and its treatment in news media (ii) investigate the impact of media representations on people's perceptions of the condition, and (iii) to develop recommendations for how to best communicate about osteoporosis and its treatment in future.
Methods: (i) A news media study (n = 218) used framing analysis to explore representations of osteoporosis and its treatment. (ii) Focus groups (n = 4) examined impact of media messages on perceptions of the condition, and its treatment, among people at risk of, with, or treating osteoporosis. Findings were synthesized to inform draft recommendations and finalised in stakeholder discussion.
Results: Study (i) found osteoporosis was framed as either a biomedical condition, lifestyle issue, or through human-interest stories. Study (ii) identified news stories elicited uncertainty, perpetuated stigma and stereotypes, and had little impact on participants. 33 recommendations spanned 4 areas: (1) identity of osteoporosis, (2) positive living and fracture prevention, (3) making information clear and accessible and (4) signposting. Recommendations highlighted the importance of:

- clearly defining osteoporosis, its cause, who is affected, how it is managed and its consequences (1).
- avoiding sensationalised messages which place blame on those affected and reducing stigma through promotion of positive portrayals of people living with osteoporosis (2).
- avoiding technical language and ensuring inclusivity by bringing in authentic voices of those with lived experience (3).
- directing audiences to relevant information and support (4).

Conclusion: This is the first study to generate evidence-based recommendations outlining how to best communicate osteoporosis and its treatment in the media. The recommendations have relevance for any audience intending to communicate about osteoporosis.
Acknowledgments: This work is funded by a Versus Arthritis PhD Scholarship. ZP is funded by the National Institute for Health Research (NIHR) (Clinician Scientist Award (CS-2018–18-ST2-010)/NIHR Academy). CJ is part funded by the NIHR Applied Research Collaboration (ARC) West Midlands.
Disclosures:
ZP has received consultancy and grant funding from UCB Pharma.

P1387
CURRENT OSTEOPOROSIS CARE IN UK PRIMARY CARE SETTINGS: A NATIONAL ESURVEY

A. Hawarden[1], N. Cox[1], L. Bullock[1], J. Protheroe[1], C. Jinks[1], Z. Paskins[1]

[1]Primary Care Centre Versus Arthritis, School of Medicine, Keele Univ., Newcastle-under-Lyme, UK

Objective: To identify current practice and perceptions of osteoporosis care in UK primary care settings.
Methods: Primary care staff were invited, via social media and research/professional networks, to participate in a national eSurvey. Participants were asked about professional role, experience of, confidence in, and challenges of delivering osteoporosis care.
Results: Data were collected August-November 2023. 341 participants completed or partially completed the eSurvey, consisting of 309 healthcare professionals (HCPs) and 32 non-HCPs (e.g., managers). Most respondents were GPs (207, 61%). 96% (325/338) of respondents agreed that osteoporosis is an important condition. However, only 20% (60/302) of HCPs reported osteoporosis care to be high priority. The majority of HCPs, were worried about the long-term side effects of osteoporosis medicines (67%, 204/306), and were not confident making recommendations about treatment breaks (64%, 193/301) or interpreting the numeric results of DXA scans (52%, 157/301). Osteoporosis care was reported to be predominantly delivered by GPs, Pharmacists and Nurse Practitioners. 247 (80%) HCPs were prescribers, most commonly using NICE guidance (160, 65%) to guide treatment decisions. 97 (39%) do not routinely provide, or direct to, patient information and 116 (47%) do not routinely arrange a medication review after prescribing osteoporosis medicines. When arranged, medication reviews are commonly generic annual reviews (75%, 97/130) and not osteoporosis specific. 176 HCPs reported conducting medication reviews and commonly asked about side effects (94%), adherence (94%) and drug administration (74%). Few enquired about back pain (44%) or height loss (29%). 19% (55/289) of HCPs reported low knowledge of osteoporosis. Improved postgraduate education, increased consultation time, and tools for risk/benefit communication were the highest rated options to help improve osteoporosis care.
Conclusion: To our knowledge, this is the first national survey of osteoporosis care in UK primary care settings. A qualitative study will further explore eSurvey results, with the long-term aim to develop resources to support evidence-based osteoporosis care.
Acknowledgement: Funding by a Versus Arthritis Clinical Research Fellowship (22,726).
Disclosures:
AH is funded by a Versus Arthritis Clinical Research Fellowship (ref 22,726). NC is funded by the Haywood Foundation and Keele Haywood Academic Rheumatology Group. CJ is part funded by the NIHR Applied Research Collaboration (ARC) West Midlands. ZP is funded by the NIHR, Clinician Scientist Award (CS-2018–18-ST2-010)/NIHR Academy. ZP has received consultancy fees from UCB for a non-promotional advisory board.

P1388
HEMATOLOGICAL COMPLICATIONS OF BIOTHERAPIES IN RHEUMATIC DISEASES

Z. S. Zanned[1], B. S. Bouden[1], R. L. Rouached[1], B. A. Ben Tekaya[1], M. I. Mahmoud[1], T. R. Tekaya[1], S. O. Saidane[1], A. L. Abdelmoula[1]

[1]Rheumatology Dept.—Charles Nicolle Hospital Tunis, Tunis, Tunisia

Objective: Biotherapies have revolutionized the management of several chronic inflammatory rheumatic diseases. Although their efficacy is proven, some adverse effects have been reported, such as hematological complications. We aimed to study the frequency of hematological adverse effects in patients treated with biotherapies.
Methods: A single-center retrospective study was conducted. Patients diagnosed with rheumatoid arthritis (RA) or spondyloarthritis (SpA) between 1992–2016 and treated with biotherapies were included. Clinical and treatment-related data, including hematological adverse events, were studied.

Results: 82 patients were included. 29 men and 54 women. The mean age was 49,3 y (22–75 y). 48 were diagnosed with RA and 35 with SpA (14 ankylosing spondylitis, 11 inflammatory bowel disease-associated SpA and 10 psoriatic arthritis). 29 patients were treated with infliximab (35%), 20 with etanercept (25%), 11 with adalimumab (13%), 20 with rituximab (25%) and 2 with tocilizumab (2%). Eight cases of hematological complications were reported (10%): 2 cases of thrombocytopenia and 6 cases of leukopenia (3 cases neutropenia and 3 cases lymphopenia). Five of these were treated with infliximab, 1 with adalimumab and 1 with rituximab. The average time onset was 8 months (1–24). In 1 case, discontinuation of infliximab and switch to etanercept was accompanied by normalization of the cell blood count. In the other cases, treatment was continued with regular monitoring.
Conclusion: Blood count disorder is not an uncommon phenomenon under biological treatment, reported in 10% of this series. It is mostly observed in patients receiving infliximab.

P1389
ARE VIRAL INFECTIONS FREQUENT IN PATIENTS TREATED WITH BIOTHERAPIES?

B. S. Bouden[1], Z. S. Zanned[1], R. L. Rouached[1], B. A. Ben Tekaya[1], M. I. Mahmoud[1], T. R. Tekaya[1], S. O. Saidane[1], A. L. Abdelmoula[1]

[1]Rheumatology Dept.—Charles Nicolle Hospital Tunis, Tunis, Tunisia

Objective: Biotherapies are widely used to treat chronic inflammatory rheumatic diseases such as rheumatoid arthritis (RA) and spondyloarthritis (SpA). Among the side effects, several studies have reported an increased risk of opportunistic infections such as tuberculosis, parasitic and viral infections. We aimed to study the frequency of viral infections in patients treated with biotherapies.
Methods: A single-center retrospective study was conducted. Patients diagnosed with RA or SpA between 1992–2023 and treated with biotherapies were included. Clinical and treatment-related data, including viral complications, were studied.
Results: 84 patients were included. 29 men and 55 women. The average age was 59 y (22–75 y). 50 were diagnosed with RA. 34 SpA (13 ankylosing spondylitis, 11 inflammatory bowel disease-associated spa and 10 psoriatic arthritis). 29 patients were treated with infliximab, 20 with etanercept, 11 with adalimumab, 21 with rituximab and 3 with tocilizumab. Seven episodes of viral infections were reported (8%): two cases of herpes zoster, two cases of herpes simplex infection and three cases of reactivated hepatitis B. Six patients were on TNFα inhibitors: 4 infliximab and 2 etanercept. one patient was on rituximab. These infections were diagnosed after an average of 36 months from the start of treatment with biotherapies (6–60 months). The two cases of herpes zoster were cured after discontinuation of etanercept and initiation of acyclovir. The herpes simplex infection was managed with acyclovir, and infliximab treatment has been resumed 2 weeks after. The 3 cases of hepatitis B were controlled by antiviral treatment.
Conclusion: Biological therapies, especially TNFα inhibitors, may lead to an increased risk of viral infections. These infections were reported in 8% of our patients.

P1390
QUALITY OF LIFE AND ANXIETY-DEPRESSIVE DISORDERS IN PATIENTS WITH AXIAL SPONDYLOARTHRITIS

Z. S. Zanned[1], B. S. Bouden[1], R. L. Rouached[1], B. A. Ben Tekaya[1], M. I. Mahmoud[1], T. R. Tekaya[1], S. O. Saidane[1], A. L. Abdelmoula[1]

[1]Rheumatology Dept.—Charles Nicolle Hospital Tunis, Tunis, Tunisia

Objective: Axial spondyloarthritis (AxSpA) is a chronic inflammatory rheumatic disease that affects young adults and can cause significant pain and functional disability. It may be accompanied by fatigue, anxiety and even depression which can have a negative impact on quality of life (QoL). The aim of the study was to assess the level of QoL and the association of anxiety, depression and clinical factors with the quality of life of patients with AxSpA.
Methods: We conducted a cross-sectional study, including patients diagnosed with AxSpA according to ASAS 2009 criteria, followed at a Tunisian Rheumatology Department. For each patient, sociodemographic, disease, and treatment data were assessed. Each patient completed the Hospital Anxiety and Depression Scale (HAD) questionnaire to screen for anxiety and depression, and the ASQol: Ankylosing Spondylitis Quality of Life questionnaire to assess quality of life (QoL) (score ranging from 0 (good QoL) to 18 (poor QoL)).
Results: Our study included 105 patients with AxSpA, 67.6% of whom were men, with a mean age of 41.9 ± 13.76 y and a mean disease duration of 11.81 y [1–50]. Mean BASDAI was 4.46 ± 2.5 and mean BASFI was 4.87 ± 2.18. Mean CRP was 24.12 ± 10.2 mg/l. 62.3% of patients had coxitis, 9.1% of whom had undergone total hip replacement. Regarding the treatment, 10.47% were on biotherapy. Depression was noted in 49.5% of patients, with a mean HADS depression of 10.41 ± 3.6. Anxiety was noted in 64.7% of patients, with a mean HADS anxiety of 9.82 ± 4.3. For the quality-of-life score, the mean ASQoL was 8.27 ± 4.71. A high ASQoL, indicating impaired quality of life, was significantly associated with an early age of onset ($p = 0.04$) and high CRP levels ($p = 0.01$). A significant relationship was also found between HAD and hip involvement ($p = 0.001$) and HAD correlated positively with BASDAI ($p = 0.002$).
Conclusion: These findings should encourage practitioners to screen AxSpA patients for anxiety and depressive disorders. Controlling factors associated to these indices, including inflammation, high disease activity and the presence of hip involvement is crucial to promote QoL.

P1391
TUBERCULIN SKIN TEST AND INTERFERON-GAMMA TESTS IN SCREENING OF LATENT TUBERCULOSIS BEFORE BIOLOGICAL TREATMENT

B. S. Bouden[1], Z. S. Zanned[1], R. L. Rouached[1], B. A. Ben Tekaya[1], M. I. Mahmoud[1], T. R. Tekaya[1], S. O. Saidane[1], A. L. Abdelmoula[1]

[1]Rheumatology Dept.—Charles Nicolle Hospital Tunis, Tunis, Tunisia

Objective: Among the infectious complications of biotherapies, tuberculosis reactivation is a not an uncommon complication. Therefore, it is essential to screen for latent tuberculosis (LTBI) prior to starting biologic therapy. Two types of screening tests for LTBI are currently available: the tuberculin skin test (TST) and the interferon-gamma release assay (IGRA). We aimed to compare the results of these two methods in the detection of latent tuberculosis.
Methods: Patients with rheumatoid arthritis (RA) or spondyloarthritis (SpA) at a rheumatology department, and eligible for biotherapy were included between 2020–2023. All these patients had an IGRA test and a TST.
Results: 130 patients including 43 men and 87 women were included. The mean age was 48 y (25–79). 99 had RA and 31 had SpA. All patients had their BCG vaccination correctly, and 12 of them had previously contracted active tuberculosis. Sputum BK tests were positive in 9 (6.9%) patients. A thoracic CT scan was requested for 48

patients and showed: signs of tuberculosis in 21 (16.15%), interstitial involvement in 11 (8.4%) patients and pulmonary fibrosis in 9 (6.9%) patients. The TST was positive in 34 patients (26.15%) and negative in 96 (73.8%). The IGRA test was positive in 25 patients (19.2%) and negative in 105 patients (80,7%). In 14 cases (10.7%), the IGRA test was negative and the TST positive, while in 5 cases (3.8%), it was the opposite. In all other cases, the findings of the 2 tests were matching. By applying the kappa test, we observe a moderate strength of agreement between these two methods (k = 0.575).

Conclusion: The risk of reactivation of latent tuberculosis increases with biotherapy, hence the importance of a good screening tool during the pre-treatment assessment and chemoprophylaxis, especially in an endemic country like ours.

P1392
WORK INSTABILITY AND ITS ASSOCIATED FACTORS AMONG PATIENTS WITH SPONDYLOARTHRITIS

Z. S. Zanned[1], R. L. Rouached[1], B. S. Bouden[1], B. A. Ben Tekaya[1], M. I. Mahmoud[1], T. R. Tekaya[1], S. O. Saidane[1], A. L. Abdelmoula[1]

[1]Rheumatology Dept.—Charles Nicolle Hospital Tunis, Tunis, Tunisia

Objective: Patients with spondyloarthritis often encounter challenges in maintaining employment due to the disease's impact on their work ability. This study aimed to assess the relationship between disease activity, function, and the work instability. Then, to identify factors associated with moderate to high levels of work instability.

Methods: A cross-sectional observational study was conducted. Demographic data (age, gender, educational level) and disease-related parameters (disease activity using BASDAI and ASDAS-CRP, CRP, VAS, functional ability with BASFI, extra articular manifestation) were collected Depression and anxiety were assessed using the Hospital Anxiety and Depression Scale (HAD). We also assessed whether the patient assisted regularly to their checkups in the last year. Job characteristics and workplace adaptations were recorded. Work instability was evaluated using AS-WIS, with results categorized as low (less than 10), medium (10–17), and high (above 17). Statistical analysis was performed using SPSS26 with the Mann–Whitney U test, χ^2 test, and Spearman's correlation.

Results: The study included 41 patients (M/F sex ratio was 2.72) with a mean age of 39.34 ± 12.58. Extra articular manifestations were present in 12 patients, including uveitis (16.7%), restrictive lung disease (25%), inflammatory bowel disease (33.3%), and psoriasis (25%). Disease parameters revealed a mean BASDAI of 3.08 ± 1.6, ASDAS-CRP 2.53 ± 1.13, and BASFI 4.18 [0.5–8.5]. Patients were under NSDAIDs in 24,1%, csDMARDS in 22,3%, and bDMARDs in 22%. Eleven patients (26,8%) had regular physical reeducation. Educational levels varied, with 31.8% having elementary education, 44% high school, and 24.4% university. The mean depression score was 5,74 ± 1,9 and the mean anxiety score was 4,54 ± 1,6. The mean AS-WIS score was 11,17 [2–18], Work instability was present in 58.8% of patients. Work instability was significantly associated with extra articular manifestations ($p = 0.004$) and lower educational levels ($p = 0.013$). Regular check-ups and physical reeducation were associated with work stability ($p = 0.04$ and $p = 0.01$, respectively). Significant correlations were observed between AS-WIS and disease parameters (BASDAI $R = 0.58; p < 0.001$, ASDAS-CRP $R = 0.46; p = 0{,}015$, BASFI $R = 0.66; p < 0.001$ and VAS $R = 0.70$, $p < 0.01$). Finally, AS-WIS correlated with HAD with its two components A and D ($R = 0.52$; $p = 0.001$ and $R = 0.63; p < 0.001$ respectively).

Conclusion: Work instability in patients with spondyloarthritis is closely linked to disease activity, functional ability, and indicators of psychiatric comorbidity. Regular monitoring and physical reeducation appear to be associated with improved work stability.

P1393
LOSS OF BODY WEIGHT IS DOSE-DEPENDENTLY ASSOCIATED WITH REDUCTIONS IN SYMPTOMS OF HIP OSTEOARTHRITIS

Z. Salis[1], R. Gallagher[2], L. Lawler[2], A. Sainsbury[3]

[1]Univ. of Geneva, Geneva, Switzerland, [2]Prima Health Solutions, Sydney, Australia, [3]Univ. of Western Australia, Perth, Australia

Objective: The burden of hip osteoarthritis (OA) on individuals and countries is substantial, significantly impacting daily activities and quality of life and incurring considerable economic costs. With no cure currently available for hip OA, effective management strategies, particularly weight loss, are crucial. Although weight loss is a recommended strategy for managing hip OA, the evidence is primarily from knee OA studies and is therefore not directly applicable to hip OA. This study aims to fill this gap by examining the impact of weight loss on HOA symptoms.

Methods: 1408 individuals diagnosed with hip OA were enrolled in an 18-week weight-loss program. All participants had clinically confirmed symptomatic hip osteoarthritis and a BMI of 25 kg/m^2 or higher. The weight-loss program was a remotely delivered intervention spanning 18 weeks, incorporated a low energy diet (phased use of meal replacements and portion-controlled light meals) and a lifestyle modification program plus a self-directed in-home Strength, Mobility and Pain Management program. The program aimed to achieve a 7–10% reduction in body weight over its 18-week period, emphasizing the transformation of the dietary habits of participants. At baseline and at the end of the 18-week period, body weight and all five subscales of the Hip disability and Osteoarthritis Outcome Score (HOOS) (pain, other symptoms, function in daily living, sports and recreation, and quality-of-life) were measured, with scores ranging from 0 (worst symptoms) to 100 (no symptoms). Linear regression, controlling for sex and baseline values of age, BMI, and HOOS, was used to evaluate the relationship between categories of weight loss ($\leq 2.5\%$, > 2.5–5.0%, > 5.0–7.5%, > 7.5–10%, and $> 10\%$ of baseline weight), and changes in all five subscales of the HOOS.

Results: Participants had a mean ± standard deviation (SD) age of 65.14 ± 9.42 y; 70% were female; the mean ± SD BMI was 34.12 ± 5.19 kg/m^2; and 78% had a BMI classified as obese (i.e., ≥ 30 kg/m^2). A statistically significant dose–response relationship was observed between weight loss categories and all five subscales of the HOOS, such that greater weight loss was associated with greater scores (i.e., fewer symptoms) (Table 1). The greatest improvement was in the quality-of-life subscale (mean ± SD point: 14.42 ± 18.62, 31.14% from the baseline) in the $> 10\%$ weight loss category (Table 1).

Table 1. Relationship between the different weight loss categories (according to percentage body weight loss) and HOOS subscales. Values are the mean±SD unless indicated otherwise. A positive difference for the Hip Disability and Osteoarthritis Outcome Score (HOOS) subscales indicates an improvement. MCII: Minimal clinically important improvement;

	All (n = 1,408)	≤2.5% n = 117	>2.5-5.0% n = 264	>5.0-7.5% n = 358	>7.5-10.0% n = 313	>10% n = 356	Significance (linearity)
Change in weight (kg) from baseline	-7.19 ± 4.26	-0.73 ± 1.55	-3.65 ± 0.99	-5.83 ± 1.24	-8.23 ± 1.53	-12.39 ± 3.72	**< 0.001**
Change in weight (%) from baseline	-7.55 ±3.99	-0.78 ± 1.56	-3.89 ± 0.77	-6.25 ± 0.73	-8.70 ± 0.71	-12.76 ± 2.42	**< 0.001**
Age, years	65.14 ± 9.42	63.22 ± 9.51	64.92 ± 9.73	66.18 ± 8.89	65.5 ± 9.41	64.56 ± 9.59	0.647
Baseline weight, kg	94.66 ± 17.26	95.07 ± 18.21	93.79 ± 16.8	93.26 ± 16.45	94.75 ± 16.76	96.49 ± 18.38	0.074
Baseline HOOS pain subscale	61.98 ± 18.35	61.19 ± 19.36	61.91 ± 18.23	61.99 ± 18.42	61.58 ± 17.91	62.61 ± 18.49	0.545
Change in HOOS pain subscale after weight loss (%)	10.28 ± 14.5 (16.58)	5.17 ± 14.7 (8.45)	9.09 ± 14.06 (14.68)	9.76 ± 14.83 (15.74)	11.17 ± 14.43 (18.14)	12.57 ± 13.99 (20.08)	**< 0.001**
Baseline HOOS limitations in activities of daily living subscale	63.19 ± 18.77	61.23 ± 19.71	63.65 ± 19.13	63.18 ± 18.38	62.59 ± 18.62	64.03 ± 18.75	0.404
Change in HOOS limitations in activities of daily living subscale after weight loss (%)	10.22 ± 14.47 (16.17)	5.88 ± 14.56 (9.60)	8.92 ± 14.51 (14.01)	9.49 ± 13.62 (15.02)	10.90 ± 14.57 (17.41)	12.75 ± 14.7 (19.91)	**< 0.001**
Number (%) of participants who met or exceeded MCII for WOMAC function score after weight loss	790 (56.11)	50 (42.74)	135 (51.14)	193 (53.91)	185 (59.11)	227 (63.76)	**0.002**
Baseline HOOS symptoms including auditory and sensory manifestations, stiffness, and mobility limitations subscale	65.62 ± 18.45	65.47 ± 20.06	65.95 ± 18.27	66.85 ± 17.16	64.54 ± 18.38	65.13 ± 19.34	0.404
Change in HOOS symptoms including auditory and sensory manifestations, stiffness, and mobility limitations subscale after weight loss (%)	8.77 ± 15.16 (13.36)	4.96 ± 14.73 (7.58)	7.12 ± 14.93 (10.80)	7.96 ± 14.61 (11.91)	10.42 ± 15.34 (16.15)	10.60 ± 15.5 (16.28)	**< 0.001**
Baseline HOOS functionality in sports and recreation subscale	44.54 ± 25.66	44.91 ± 26.85	46.32 ± 26.69	44.84 ± 25.06	41.97 ± 25.18	45.01 ± 25.46	0.410
Change in HOOS functionality in sports and recreation subscale after weight loss (%)	10.12 ± 23.53 (22.72)	4.53 ± 24.45 (10.09)	7.14 ± 21.94 (15.41)	7.72 ± 24.22 (17.22)	13.62 ± 24.25 (32.45)	13.64 ± 22.12 (30.30)	**< 0.001**
Baseline HOOS hip-related quality of life subscale	45.82 ± 21.18	43.43 ± 23.88	45.76 ± 21.50	46.63 ± 20.66	45.29 ± 19.83	46.30 ± 21.7	0.458
Change in HOOS hip-related quality of life subscale after weight loss (%)	11.48 ± 17.97 (25.05)	7.03 ± 17.67 (16.19)	9.82 ± 17.38 (21.46)	10.33 ± 16.77 (22.15)	12.50 ± 18.65 (27.60)	14.42 ± 18.62 (31.14)	**< 0.001**

Conclusion: Our findings suggest that weight loss could reduce the symptoms of hip OA, supporting the potential of weight loss as an effective treatment strategy for hip OA.

P1394
BISPHOSPHONATES SHOW NO ASSOCIATION WITH PREVENTING, SLOWING, OR DELAYING RADIOGRAPHIC CHANGES AND PAIN IN HIP OSTEOARTHRITIS: A FOUR-YEAR STUDY IN FEMALE ADULTS USING DATA FROM THE OSTEOARTHRITIS INITIATIVE STUDY

Z. Salis[1]

[1]Univ. of Geneva, Geneva, Switzerland

Objective: To investigate the potential impact of bisphosphonates on radiographic changes and pain in individuals with no or early stages of hip osteoarthritis (OA).

Methods: This study examined data from the Osteoarthritis Initiative (OAI), which included 4,088 hips from 2,057 participants, predominantly with no or early stages of radiographic hip OA at baseline. Bisphosphonate users were identified as those who reported usage at least three times, including at baseline and during the subsequent 1-y, 2-y, 3-y, and 4-y follow-up visits. Non-users were participants who did not use bisphosphonates in the 5 y preceding the baseline and at subsequent follow-up visits. Generalized estimating equations were performed to assess the association between bisphosphonate use and outcomes relating to radiographic changes and pain in hip OA over a 4-y follow-up.

Results: The analysis revealed no statistically significant difference between bisphosphonate users and non-users concerning radiographic changes and pain in hip OA over 4 ys. Specifically, the odds ratios for the incidence and progression of radiographic hip OA were 0.58 (95%CI: 0.27 to 1.22) and 0.80 (95%CI: 0.49 to 1.32), respectively (Table 1). Furthermore, the odds ratios for the development and resolution of frequent hip pain were 1.04 (95%CI: 0.76 to 1.42) and 0.99 (95%CI: 0.72 to 1.36), respectively (Table 2).

Table 1. Association of bisphosphonate use and incidence and progression of radiographic hip OA, and worsening individual radiographic features of the hip OA, during 4-y follow-up in radiographic hip OA cohort, as shown in univariate and multivariable analyses.

Outcomes	Users*	Non-users^
Hips	N=666	N=2,599
(Participants)	n=337	n=1,314
Incidence of radiographic hip OA		
Events (%)	10 (1.50)	45 (1.73)
Univariate analysis		
Odds ratio (95%CI)	0.87 (0.42 to 1.78))	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.58 (0.27 to 1.22)	1 (reference)
Progression of radiographic hip OA		
Events (%)	25 (3.75)	91 (3.50)
Univariate analysis		
Odds ratio (95%CI)	1.07 (0.67 to 1.73)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.80 (0.49 to 1.32)	1 (reference)
Worsening individual radiographic features of hip OA		
Joint space narrowing lateral		
Events (%)	10 (1.50)	40 (1.54)
Univariate analysis		
Odds ratio (95%CI)	0.98 (0.46 to 2.06)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.79 (0.36 to 1.75)	1 (reference)
Joint space narrowing medial		
Events (%)	33 (4.95)	95 (3.66)
Univariate analysis		
Odds ratio (95%CI)	1.37 (0.87 to 2.15)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.95 (0.59 to 1.53)	1 (reference)
Osteophytes acetabular superior		
Events (%)	12 (1.80)	47 (1.81)
Univariate analysis		
Odds ratio (95%CI)	1.00 (0.49 to 2.03)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.82 (0.38 to 1.74)	1 (reference)
Osteophytes acetabular inferior		
Events (%)	5 (0.75)	16 (0.62)
Univariate analysis		
Odds ratio (95%CI)	1.22 (0.43 to 3.50)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	1.07 (0.35 to 3.30)	1 (reference)
Osteophytes femoral superior		
Events (%)	16 (2.40)	67 (2.58)
Univariate analysis		
Odds ratio (95%CI)	0.93 (0.51 to 1.67)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.71 (0.38 to 1.32)	1 (reference)
Osteophytes femoral inferior		
Events (%)	8 (1.20)	15 (0.58)
Univariate analysis		
Odds ratio (95%CI)	2.07 (0.82 to 5.22)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	1.13 (0.43 to 2.97)	1 (reference)
By the sum of osteophyte scores		
Events (%)	11 (1.65)	29 (1.12)
Univariate analysis		
Odds ratio (95%CI)	1.46 (0.67 to 3.19)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	1.05 (0.46 to 2.39)	1 (reference)

* Defined as bisphosphonate use at least three examinations, including baseline and follow-up visits (1-year, 2-year, 3-year, and 4-year). ^Non-users were identified as those who did not use bisphosphonates in the preceding 5 years and at any of the examined time points. Multivariable analysis was adjusted for the baseline values of age and BMI. CI: Confidence Interval; OA: Osteoarthritis.

Table 2. Association of bisphosphonate use and development and resolution of frequent and any pain in the hip during 4-year follow-up in frequent hip pain cohort and any hip pain cohort, respectively, as shown in univariate and multivariable analyses.

Outcomes	Users*	Non-users^
Frequent hip pain cohort		
Hips	N=680	N=2,782
(Participants)	n=356	n=1,461
Development of frequent pain in the hip		
Events (%)	88 (12.94)	353 (12.69)
Univariate analysis		
Odds ratio (95%CI)	1.02 (0.76 to 1.36))	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	1.04 (0.76 to 1.42)	1 (reference)
Resolution of frequent pain in the hip		
Events (%)	86 (12.65)	355 (12.76)
Univariate analysis		
Odds ratio (95%CI)	0.98 (0.73 to 1.32)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.99 (0.72 to 1.36)	1 (reference)
Any hip pain cohort		
Hips	*N=530*	*N=2,136*
(Participants)	*n*=315	*n*=1,272
Development of any pain in the hip		
Events (%)	108 (20.38)	470 (22.00)
Univariate analysis		
Odds ratio (95%CI)	0.91 (0.70 to 1.18)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.99 (0.75 to 1.30)	1 (reference)
Resolution of any pain in the hip		
Events (%)	135 (25.47)	539 (25.23)
Univariate analysis		
Odds ratio (95%CI)	0.98 (0.76 to 1.26)	1 (reference)
Multivariate analysis		
Odds ratio (95%CI)	0.93 (0.71 to 1.22)	1 (reference)

* Defined as bisphosphonate use at least three examinations, including baseline and follow-up visits (1-year, 2-year, 3-year, and 4-year). ^Non-users were identified as those who did not use bisphosphonates in the preceding 5 years and at any of the examined time points. Multivariable analysis was adjusted for the baseline values of age, BMI, and analgesic use. CI: Confidence Interval; OA: Osteoarthritis.

Conclusion: The findings from this longitudinal study do not suggest an association between bisphosphonate use and the prevention, slowing, or delay of development and progression of radiographic changes or pain in hip OA among individuals with no or early stages of hip OA over a 4-y follow-up.

P1395
ELDECALCITOL INHIBITS BONE TURNOVER AND INCREASES BONE MASS VIA ACTING ON BMSCS

A. Xiong[1], Y. Gu[1], H. Li[1], M. Lin[1], R. Zhang[2], D. Bikle[3], Z. Xie[1]

[1]National Clinical Research Center for Metabolic Diseases, Hunan Provincial Key Laboratory of Metabolic Bone Diseases, and Dept. of Metabolism and Endocrinology, The Second Xiangya Hospital of Central South Univ., Changsha, China, [2]Dept. of Medical Laboratory, Hunan Normal Univ. School of Medicine, Changsha, China, [3]Veterans Affairs Medical Center, Univ. of California San Francisco, San Francisco, USA

Objective: Eldecalcitol (ELD) is an active vitamin D analogue that has been shown to inhibit bone turnover and increase bone mass, but the underlying mechanism is unclear. Bone marrow mesenchymal stem cells (BMSCs) are the progenitor cells of osteoblasts, and we hypothesized that ELD increases bone mass by acting on BMSCs. To test the hypothesis, we investigated the effect of ELD on bone mass and osteogenic differentiation of BMSCs in the vitamin D receptor (VDR) conditional knockout mice (VDR-cKO).

Methods: VDR-cKO mice were generated by breeding floxed-VDR mice and PRX1-Cre mice. Floxed-VDR mice were used as a control. Both control and VDR-cKO mice were treated with ELD at a dose of 50 ng/kg or vehicle for 4 weeks. μCT was performed to examine the bone mass and bone microstructure morphometrics of femur. Calcein double-labeling, ALP, and TRAP staining were used to examine the

bone mineral apposition rate (MAR), the number of osteoblasts, and osteoclasts, respectively. Primary BMSCs were isolated from 8-week-old wildtype mice and cultured in osteogenic medium. Cells were treated with ELD at concentrations of 10^{-10}, 10^{-9}, or 10^{-8} M for 7 d. The expression of RANK in BMSCs was reduced by siRNA and cells were then treated with 10^{-9} M ELD for 72 h. The mRNA and protein expression levels of RANK, RANKL and osteogenic differentiation markers including ALP and RUNX2 were examined by quantitative PCR.

Results: μCT showed that control mice treated with ELD showed increases in bone mass, bone volume percentage, and bone trabecular number as well as decreases in bone trabecular separation compared to those treated with the vehicle. Calcein double-labeling, ALP, and TRAP staining showed that control mice treated with ELD showed decreases in MAR, number of positive osteoblasts and osteoclasts compared to those treated with the vehicle. However, the effects of ELD were blocked by conditional knockout of VDR in BMSCs in mice. Treatment of BMSCs with ELD inhibited expressions of differentiation markers including ALP, RUNX2 and RANKL, and promoted RANK expression in BMSCs in a dose-dependent manner. However, the inhibitory effect of ELD on the expression of ALP, RUNX2, and RANKL was blocked by downregulation of RANK in BMSCs.

Conclusion: ELD inhibits bone turnover and increases bone mass via acting on the VDR of BMSCs. ELD inhibits osteogenic differentiation and RANKL expression via promoting the expression of RANK in BMSCs.

Acknowledgment: This work was supported by Chugai Pharma China Co., Ltd.

World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2024): Sponsored Sessions Abstracts

SY1
EARLY DETECTION OF OSTEOARTHRITIS: A SPECIFIC QUESTIONNAIRE FOR CLINICAL ASSESSMENT OF KNEE OA

A. Migliore[1]

[1]Head of Rheumatology Unit at San Pietro Fatebenefratelli Hospital, Rom, Italy

Latest global estimates suggest 595 million people were living with OA in 2020. The knee joint was the most affected site reported.

Despite the vast overall burden of disease an official definition of early stage of osteoarthritis (EOA) and its classification criteria are still lacking. Their validation would facilitate an early diagnosis to identify symptomatic knee OA and maximize the opportunity for treatment in the initial phase.

A novel tool to assess knee EOA has been created by a technical experts panel from the International Symposium Intra Articular Treatment (ISIAT) and is presented here by its primary author. The questionnaire is designed for diagnostic and follow-up assessment and considers two domains (Clinical Features and Patients Reported Outcome) for a total of 11 questions. The questions mainly explore the field of early symptoms and patients reported outcomes. This tool will provide guidance on treatment decisions (if pharmacological or non-pharmacological intervention is required) and will be used to monitor symptom progression and disease evolution.

SY2
EXPLORING SYSADOAS IN THE MANAGEMENT OF OSTEOARTHRITIS

N. Fuggle[1]

[1]Associate Professor of Rheumatology, MRC Lifecourse Epidemiology Centre, University of Southampton, Southampton, United Kingdom

The early stages of osteoarthritis provide a potential window of opportunity to change the disease trajectory and improve quality of life. For this reason, early diagnosis allows timely disease management and burden reduction. By using a multimodal approach including a range of non-pharmacological and pharmacological interventions throughout the course of the disease, there is a greater opportunity for effective symptomatic treatment and a possible opportunity to slow disease progression. Dr. Fuggle's presentation will focus on the role of symptomatic slow-acting drug for osteoarthritis (SYSADOAs) in the early stages of this important condition with particular focus on prescription grade glucosamine sulphate. Attention will be paid to the key efficacy and safety data for this medicine which forms an important part of the ESCEO guidelines for the management of osteoarthritis.

SY3
BALANCE BETWEEN EFFECTIVENESS AND SAFETY WHEN CHOOSING NSAIDS FOR OSTEOARTHRITIS TREATMENT

E. Choy[1,2]

[1]Head of Rheumatology and Translational Research Division of Infection and Immunity, Cardiff University School of Medecine, Cardiff, United Kingdom, [2]Director of the Cardiff Regional Experimental Arthritis Treatment and Evaluation (CREATE) Centre, Cardiff University School of Medicine, Cardiff, United Kingdom

Non-steroidal anti-inflammatory drugs (NSAIDs) are broadly recommended by treatment guidelines as a pharmacological option for the symptomatic relief of osteoarthritis. Medicines in the drug class are crudely divided into two groups; COX-2 selective agents and non selective medicines that inhibit both the COX-2 and COX-1 isoforms. COX-2 selective agents have been associated with a reduced propensity for gastrointestinal harms when compared to non-selective agents, and recent data has added to what is known around their cardiovascular and renal harms. Professor Choy's presentation will focus on an update on the management of osteoarthritis with consideration of key efficacy and safety data for the COX-2 selective NSAID-celecoxib.

SY4
FLSS NEED TO CHANGE: WHY, WHAT AND HOW

UCB[1]

[1]UCB, Brussels, Belgium

Professor Kassim Javaid.
University of Oxford, Oxford, UK
Join esteemed expert Professor Kassim Javaid as he shares his clinical experience with establishing an efficient fracture liaison service (FLS) in post-fracture care, and the essential role it plays in the identification of osteoporosis patients at very high fracture risk (VHFR).

Drawing on his expertise, Professor Javaid will share his thoughts on **why** the traditional FLS system needs updating to meet the current challenges in fragility fracture care and describe **what** common barriers are impeding FLS optimisation. The session will focus on **how** to make practical and sustainable improvements, including how to take advantage of digital solutions, to achieve FLS goals and more comprehensive identification processes for VHFR patients.

This session will give delegates the tools to review and advance new and existing FLS plans to improve clinical outcomes for their patients at the highest risk of fracture. The interactive format encourages the audience to provide their comments, thoughts and questions throughout.

Reference:

Kanis JA, et al. Arch Osteoporos. 2021;16(1):82.

This session is only open to healthcare professionals who are registered for WCO-IOF-ESCEO 2024.

EU-DA-2400029 |Date of preparation: January 2024.

SY5
CLOSING THE TREATMENT GAP WITH ROMOSOZUMAB▼ FIRST: EVIDENCE FROM THE REAL WORLD

UCB[1]

[1]UCB, Brussels, Belgium

With almost three-quarters of patients at high risk of fracture going untreated, the need to close the treatment gap in osteoporosis has never been more pressing.[1] Join us for this enriching and thought-provoking session to explore strategies that you can implement in your own clinical practice to streamline identification of patients at the highest risk of fracture and ensure eligible patients receive romosozumab first in sequential treatment.*.[2]

Our international panel of experts in bone health, Chair Professor Richard Keen (Royal National Orthopaedic Hospital, UK), Professor Bente Langdahl (Aarhus University Hospital, Denmark), Professor Serge Ferrari (Geneva University Hospitals, Switzerland), and Professor Carmelinda Ruggiero (University of Perugia, Italy), will bring their invaluable insights and extensive real-world clinical experiences of adopting a 'romosozumab-first' approach to proactively close the treatment gap in osteoporosis, which delegates can draw from to guide future clinical decision-making.

Be an active participant and help shape the discussion at this interactive session at WCO-IOF-ESCEO 2024!

References

1. Kanis JA, et al. Arch Osteoporos. 2021;16(1):82.

2. Romosozumab® EU SmPC. https://www.ema.europa.eu/en/documents/product-information/evenity-epar-product-information_en.pdf. Accessed February 2024.

*Within the licensed population.

In the EU, romosozumab is indicated in treatment of severe osteoporosis in postmenopausal women at high risk of fracture.[2]

This promotional symposium is only open to healthcare professionals who are registered for WCO-IOF-ESCEO 2024.

This promotional symposium is sponsored and organised by UCB Biopharma SRL and is co-supported by Amgen. UCB/Amgen medicines will be discussed at this meeting. UCB is a sponsor of WCO-IOF-ESCEO 2024.

Romosozumab prescribing information is available at booths 13 and 14. Licenses may vary by country. Please always refer to the Prescribing Information (PI) in your country before prescribing any drug.

▼This medicinal product is subject to additional monitoring. This will allow quick identification of new safety information. Healthcare professionals are asked to report any suspected adverse reactions. Adverse events should be reported. Reporting forms and information can be found from your local regulatory authority. Adverse events should also be reported to UCB.

EU-DC-2400019 | Date of preparation: February 2024

SY6
EVOLVING PERSPECTIVES IN ADULT PATIENTS WITH PAEDIATRIC-ONSET HYPOPHOSPHATASIA: FROM DIAGNOSIS TO EFFECTIVE MANAGEMENT

M. L. Brandi[1], L. Seefried[2], A. Khan[3]

[1]University of Florence, Florence, Italy, [2]Julius Maximilian University of Würzburg, Würzburg, Germany, [3]McMaster University, Ontario, Canada

This symposium will be presented by a panel of expert clinical researchers emphasizing the importance of recognizing hypophosphatasia (HPP) in adults (and not solely in children) and the evolving landscape of diagnosis and treatment of adults with paediatric-onset HPP.

Overcoming the Diagnostic Challenge in HPP

Maria Luisa Brandi (University of Florence, Florence, Italy)

With a goal to improve healthcare professionals' diagnosis of HPP and drawing on the latest research and support tools, Prof. Brandi will discuss when to suspect HPP, the challenges of diagnosing HPP, which tests to prioritize, the importance of early detection, and the profound impact on patient outcomes.

Integrative Strategies in HPP Management

Lothar Seefried (Julius Maximilian University of Würzburg, Würzburg, Germany)

Dr. Seefried will focus on comprehensive management strategies and approaches for treating adult patients with paediatric-onset HPP. He will review functional assessment and other tools used for monitoring treatment efficacy in clinical practice. In this context, he will also elaborate on bone health in HPP and how this is different from common osteoporosis.

Bringing Adult Patients With Paediatric-onset HPP into the Spotlight: Case Studies

Aliya Khan (McMaster University, Ontario, Canada)

Prof. Khan will present 2-3 cases that exemplify the diagnostic journey and subsequent management of adult patients. Focusing on the impact of muscle weakness and pain, she will highlight the benefits of early treatment intervention based on data from recent studies and discuss lessons learned for future practice.

The symposium will conclude with all speakers advocating for a multidisciplinary approach involving endocrinologists, rheumatologists, and geneticists to diagnose and monitor HPP. Attendees will have the opportunity to ask questions, engage in discussion, and gain a deeper understanding of the complex nature of HPP diagnosis and management.

M/INT/Med HPP/0002 | February 2024This satellite symposium is fully funded and organised by Alexion, AstraZeneca Rare Disease and is intended for Healthcare Professionals only. Alexion medicines in the context of HPP management will be discussed at this meeting. Some content may be deemed promotional in your territory.

SY7
UPDATE ON PHARMACEUTICAL-GRADE CHONDROITIN SULFATE – FROM ESCEO ALGORITHM TO CLINICAL DATA

J.-Y. Reginster[1,2]

[1]King Saud University (KSU), College of Science, Riyadh, Saudi Arabia, [2]World Health Organisation Collaborating Center for Epidemiology of Musculoskeletal Health and Aging, Liège, Belgium

The ESCEO algorithm for the management of knee osteoarthritis recommends pharmaceutical-grade Chondroitin Sulfate (CS) as one of the first-line background treatments for patients with mild to moderate osteoarthritis. ESCEO strongly discourages the use of other preparations of CS, including Food Supplements. CS has been widely investigated for its capacity to reduce pain and function disability in patients with knee OA. It has also been shown to reduce the progression of the disease, i.e. joint space narrowing. In a double-blind, placebo-controlled, three-arm study, CS (800 mg/day) reduces pain and improves Lequesne index to the same extend as Celecoxib, a reference NSAIDs currently licenced and marketed for the treatment of knee OA. Both formulations provide higher benefit compared to placebo. In long-term studies, comparing CS (800 mg/day) to placebo, CS fully prevented the loss in joint space observed in the placebo group, both when looking at the minimal joint space or at the average joint space. Furthermore, CS is the only medication currently

recommended for the symptomatic management of hand OA. Safety of CS was evidenced from systematic literature reviews and subsequent meta-analyses, showing no increase in adverse events, at any body system. Subsequent analyses of large real-life database suggest that CS might be effective in reducing the risk of cardiovascular or cerebrovascular disorders in patients currently exposed to the medication at a minimal dose of 800 mg/day and for a minimal duration of 90 days. This outstanding combination of high symptomatic and structural efficacy compared to a convincing safety profile justifies the choice by ESCEO of CS (800 mg/day and 1200 mg/day) as an appropriate first-line background treatment for the management of knee OA.

SY8
ENHANCING JOINT CARE: INTEGRATING ULTRASOUND GUIDANCE AND ADVANCED HYALURONIC ACID FORMULATIONS IN INTRA-ARTICULAR INJECTIONS

E. Lanza[1]

[1]Research Fellow - Diagnostic and Interventional Radiology Humanitas University - Pieve Emanuele IRCCS Humanitas Research Hospital - Rozzano, Milano, Italy

The use of ultrasound in guiding intra-articular injections is a significant advance in musculoskeletal interventions, specifically in the administration of hyaluronic acid (HA) for joint viscosupplementation. This technique enables clinicians to accurately target the intra-articular space, enhancing the efficacy and safety of the procedure, and is rooted in precision medicine.

Recent developments in HA formulations (e.g. NAHYCO® technology) have focused on prolonging the viscoelastic properties of synovial fluid, with the aim of reducing the frequency of injections required for sustained therapeutic effect. This evolution in treatment products is pivotal in patient-centric care, minimizing discomfort and potential complications associated with frequent intra-articular access.

The combined use of advanced imaging techniques and novel HA products represents a paradigm shift in joint treatment. Ultrasound guidance affords real-time visualization, ensuring precise HA delivery and optimal distribution within the joint. This approach is applicable to a wide spectrum of joints, making it a versatile tool in the management of various joint pathologies. There is ample literature evidence suggesting that the use of ultrasound guidance during injection into any joint, including the knee, enhances accuracy and should be deemed a mandatory part of providing optimal medical care.

A critical aspect of this lecture is to present evidence from recent reviews comparing viscosupplementation under imaging guidance versus landmark-based techniques. These studies underscore the superiority of ultrasound-guided injections in terms of accuracy, patient outcomes, and overall effectiveness of the HA therapy.

In summary, the integration of ultrasound guidance with advanced HA formulations in intra-articular injections provides a more precise and tailored approach to joint care. This presentation offers a comprehensive overview, emphasizing the importance of image-guided precision and innovative therapeutics in modern joint treatment.

Author Index