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FRACTURE PATTERNS IN T1D AND THEIR ASSOCIATED RISK FACTORS—A RETROSPECTIVE COHORT STUDY

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Purpose: People with type 1 diabetes (T1DM) have a higher fracture risk at several sites compared to the general population. Therefore, we assessed the hazard ratios (HR) of various fracture sites and determined the related risk factors among people with newly diagnosed T1DM.
Methods: All people from the UK Clinical Practice Research Datalink GOLD (1987–2017), above 20 years of age with a T1DM diagnosis code (n = 3,281) and a new insulin prescription, were included and matched by sex and age to controls without diabetes (n = 3,281). Cox regression was used to estimate HRs of any, major osteoporotic fracturs (MOFs) and peripheral fractures (arms and lower-legs) for people with T1DM compared to controls. The analyses were adjusted for sex, age, diabetic complications, medication (glucocorticoids, anti-depressants, anxiolytics, bone medication, anti-convulsivae), Charlson comorbidity score, hypoglycemia, falls and alcohol. T1DM was further stratified by diabetes duration and presence of diabetic microvascular complications (retinopathy, nephropathy, and neuropathy).
Results: HRs were increased with T1DM for any (HR: 1.43,CI 95% 1.17–1.74), MOF (HR: 1.46, CI 95% 1.04–2.05), arm (HR: 1.19, CI 95% 0.82–1.74), and lower-leg (HR: 1.37, CI 95% 1.01–1.85) fractures compared with controls. Risk factors were previous fractures and falls (including lower-legs and ams). Furthermore, the fracture risk increased as the number of complications increased in T1DM (0-complications: HR: 1.45, CI95% 1.19–1.77, 1-complication: HR: 1.58, CI 95% 1.22–2.04 and ≥ 2-complications: HR: 1.62, CI 95% 1.13–2.33). Similar results were seen for MOFs (HR: 2.02, CI 95% 1.35–3.03), arms (HR: 1.33, CI 95% 1.16–2.48) and lower-leg fractures (HR: 1.56, CI 95%: 0.97–2.50). With longer diabetes duration, the risk of any fracture decreased comparing T1DM with controls (0–4 years: HR: 1.52, CI 95% 1.23–1.87. 5–9 years: HR: 1.30, CI 95% 0.99–1.71. < 10 years: HR: 1.07, CI 95% 0.74–1.55). The ranked initial risk (0–4 years) was MOFs (HR: 1.59, CI 95% 1.10–2.30), arm (HR: 1.54, CI 95% 1.12–2.11) and lower-leg fractures (HR: 1.18, CI 95% 0.78–1.78).
Conclusion: The HRs of any fractures were increased with T1DM compared to controls and associated with common risk factors. The presence of micro-vascular complications increased the risk of fractures but also at peripheral sites. The findings indicated a higher fracture risk at the onset of T1DM but a decrease with longer duration.

OC10

TYPE 1 AND 2 DIABETES MELLITUS AND INCIDENT FRACTURE RISK IN UK BIOBANK: IMPACT OF DISEASE TYPE, DURATION AND MICROVASCULAR COMPLICATIONS

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Objectives: To investigate associations between diabetes mellitus (DM) and incident fracture, stratified by subtype (type 1, DM1 or type 2, DM2), disease duration and presence/absence of diabetic complications.
Methods: In UK Biobank, we used Poisson regression to calculate incidence rate ratios (IRRs) for osteoporotic fracture to investigate: a) prospective relationships between DM and fracture risk by subtype of DM (ascertained from self-report and/or hospital records), independent of traditional clinical risk factors, BMD, adiposity and CRP; b) the impact of diabetic microvascular complications; c) interaction with duration of DM (diagnosis within 5 years, or 5 years or more before baseline).
Results: There were 502,221 participants (273,136 women, mean age 57 years; 229,085 men, 58 years). DM1 was recorded in 0.3% of women and 0.4% of men, and DM2 in 3.2% and 6.5% respectively. Both types were associated with increased risk of fracture, independent of covariates [DM1, IRR: 2.80(95% CI 1.89, 4.15); DM2: 1.31(1.09, 1.57)]. Associations were similar by sex. The fracture association for DM2 differed according to duration of disease, with duration of five years or more being a risk factor [IRR: 2.75(1.10, 6.87)] but duration of less than five years appearing possibly protective [0.42(0.16, 1.09)]. The presence of microvascular DM complications was predictive of greater fracture risk [DM with complications vs without complications, IRR 2.31(1.91, 2.79)]. This association was similar by diabetes type, and demonstrated a dose effect by number of complications.
Conclusions: Diabetes mellitus is associated with increased risk of fracture, with the quantum of effect being greater for type 1 than type 2 DM. Associations were at least partly independent of traditional risk factors, adiposity, BMD and CRP. Type 2 DM appeared protective in early disease, but a risk factor for fracture with longer disease duration, with diabetic complications in both types associated with increased fracture risk. This work was undertaken using the UK Biobank resource under approved application 3593.

OC11

HEALTH-RELATED QUALITY OF LIFE IN SARCOPENIA: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: The decrease of physical abilities and functional decline that can be caused by musculoskeletal disorders as sarcopenia, can lead to a higher level of dependence and disabilities. Therefore, it may influence patient reported outcome measures (PROM), such as

the health-related quality of life (HRQoL). The purpose of this systematic review and meta-analysis is to provide an exhaustive view on the relationship between sarcopenia and HRQoL.

Methods: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) were followed through the whole process of this work. A protocol was previously published on PROSPERO. The electronic databases MEDLINE, Scopus, Allied and Complementary Medicine (AMED), EMB Review—ACP Journal Club, EBM Review-Cochrane Central of Register of Controlled Trials and APA PsychInfo were searched up to October 2022 for observational studies reporting a HRQoL assessment in both sarcopenic and non-sarcopenic individuals. Study selection and data extraction were carried out by two independent researchers. Meta-analysis was performed with a random effect model giving an overall standardized mean difference (SMD) and its 95% confidence interval (CI) between sarcopenic and non-sarcopenic. Quality of individual studies was measured using the Newcastle Ottawa Scale and strength of evidence was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) tool.

Results: The search strategy identified 3,725 references from which 43 observational studies were eligible and included in this meta-synthesis study. A significant lower HRQoL was observed for sarcopenic individuals compared to non-sarcopenic (SMD − 0.76; 95% CI − 0.95; − 0.57). Significant heterogeneity was associated with the model (I^2 = 93%, Q test < 0.01). Subgroups analysis showed that the specific questionnaire SarQoL discriminates better sarcopenia in regards of HRQoL (SMD − 1.09; 95% CI − 1.44; − 0.74 versus − 0.49; 95% CI − 0.63; − 0.36 with generic tools; p-value for interaction < 0.01). A higher difference of HRQoL between sarcopenic and non-sarcopenic was found for individuals residing in living home cares compared to community-dwelling individuals (p-value for interaction < 0.001). No differences between age, diagnostic techniques, and continents/regions were found. Level of evidence was rated as moderate using GRADE assessment.

Conclusions: This systematic review and meta-analysis combining 43 observational studies demonstrates that HRQoL is significantly reduced in sarcopenic patients. Using disease-specific HRQoL instruments may better discriminate sarcopenic patients in regards of their quality of life.

OC12
DYNAPENIC ABDOMINAL OBESITY AND SUSCEPTIBILITY TO FALL: A PROSPECTIVE ANALYSIS OF THE OSTEOARTHRITIS INITIATIVE

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Objectives: The prediction of the risk of falling remains a challenge in geriatric medicine and the identification of new potential reversible risk factors is a public health priority. In this study, we aim to investigate the association between DAO (dynapenic abdominal obesity) and incident falls in a large sample of older people with knee OA (osteoarthritis) or at high risk for this condition, over eight years of follow-up.

Material and methods: DAO was defined using a waist circumference more than 102 cm in men and 88 cm in women and a concomitant presence of dynapenia, defined as a time over 15 s in the five times chair stands time. Falls, during follow-up, were recorded using self-reported information in the previous year. A logistic binary regression analysis was run, adjusted for potential confounders at the baseline, reporting the data as odds ratios (ORs) with their 95% confidence intervals (CIs).

Results: Overall, 3,844 subjects were included, majority of whom had abdominal obesity. Across the 8 years of follow-up, 2,695 participants fell vs. 1,149 not reporting any fall. Taking those without DAO as reference, the presence of only dynapenia was not associated with risk of falls (OR = 1.18; 95% CI 0.73–1.91; p = 0.50), whilst the presence of abdominal obesity (OR = 1.30; 95% CI 1.09–1.56; p = 0.004) and DAO (OR = 1.31; 95% CI 1.01–1.73; p = 0.04) were significantly associated with a higher risk of incident falls.

Conclusions: DAO significantly increased risk of falls as well as the presence of abdominal obesity.

OC13
SARCOPENIA DEFINITIONS AND THEIR ASSOCIATION WITH FRACTURE RISK IN OLDER SWEDISH WOMEN. THE SAHLGRENSKA UNIVERSITY HOSPITAL PROSPECTIVE EVALUATION OF RISK OF BONE FRACTURES (SUPERB) STUDY

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Objective: To investigate the prevalence and predictive value of three sarcopenia definitions for fracture risk over and above that provided by FRAX clinical risk factors (CRFs), including femoral neck (FN) BMD T-score, in a population of older Swedish women.

Material and methods: Overall, 3028 women 75–80 years old were included in the SUPERB cohort. Complete data on sarcopenia components were available in 2883 women. Sarcopenia was defined based on the Sarcopenia Definitions and Outcomes Consortium (SDOC) (low handgrip strength and gait speed), the revised European Working Group on Sarcopenia in Older People (EWGSOP2), and the Asian Working Group for Sarcopenia (AWGS) (low appendicular lean mass index (ALMI) and hand grip strength). Femoral neck BMD T-score was obtained from dual-energy X-ray absorptiometry. All fractures confirmed by X-ray or medical record review were subsequently categorized as major osteoporotic fractures (MOF) and hip fractures and deaths were verified through regional registers. Cox regression (hazard ratios (HR) and 95% confidence intervals (CI)) analyses were performed with adjustment for age, fracture risk assessment (FRAX) variables, and FN BMD T-score.

Results: The prevalence of sarcopenia was 12% (n = 360) according to EWGSOP2, 10% (n = 296) for AWGS, and 4% (n = 129) defined by SDOC. Sarcopenia according to EWGSOP2 and AWGS was not associated with an increased fracture risk or mortality in models adjusted for FRAX CRFs and FN T-score. Individuals with sarcopenia defined by SDOC had a higher mortality risk (HR 3.41; 95% CI 2.51, 4.62) and a higher risk for any fractures (HR 1.48; 95% CI 1.10, 1.99) and MOF (HR 1.42; 95% CI 1.03, 1.98) but not for hip fractures (HR 1.51; 95% CI 0.83, 2.76) compared with individuals without sarcopenia after adjusting for FRAX CRFs and FN T-score.

Conclusion: These findings suggest that incorporating sarcopenia defined by SDOC improves fracture prediction, but its low prevalence limits its clinical utility.