D levels were 82.7 ± 27.5 ng/mL (HyD), 55.4 ± 8.5 ng/mL (VD_3), 33.1 ± 14.4 ng/mL (placebo), ANOVA P < 0.001. After adjustments for baseline 25OHD and BMI, the mean (SE) percent change in total (type I/II) FCSA was -4.3 ± 9.2% (HyD), 25.1 ± 9.1% (VD_3), 4.7 ± 8.4% (placebo), with P = 0.033 between HyD and VD_3. More pronounced differences between HyD and VD_3 were noted in type I compared to the type II fibers. Percent changes in VDR and PAX-7 concentrations did not differ significantly by group (all P > 0.223).
Conclusion: Although HyD vs. VD_3 resulted in higher final 25OHD levels, muscle fiber size significantly increased with VD_3 and did not change with HyD in 6 months in younger postmenopausal women. This result supports concerns that higher 25OHD levels may not benefit skeletal muscle outcomes.
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NEUROFILAMENT-LIGHT CHAINS (NF-L), A BIOMARKER OF NEURONAL DAMAGE, IS INCREASED IN SARCOPENIC PATIENTS: RESULTS OF THE SARCOPHAGE STUDY

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Backgrounds: Recently, several papers have made the hypothesis that sarcopenia might partially due to a nervous system failure. Indeed, part of the diagnosis is based on volitional tasks that require the integrity of the nervous system to be properly realized. In the recent years, neurofilament light chains (NF-L) have emerged as a new highly specific blood-biomarker of neuronal damage. Its expression has been reported to be modified in both central and peripheral neuropathies as well as traumatic brain injuries.
Objectives: In this study, we measured NF-L in a large cohort of older individuals to define its expression in presence of sarcopenia.
Methods: The SarcoPhAge cohort is a Belgien cohort of community-dwelling older adults. A diagnosis of sarcopenia was established according to the European Working Group on Sarcopenia in older People 2 (EWGSOP2) criteria. Muscle strength was evaluated with a hydraulic hand-dynamometer, appendicular lean mass by Dual-Energy X-Ray Absorptiometry and physical performance by the Short Physical Performance Battery test (SPPB). NF-L, was measured on all the available sera collected at time of inclusion (n = 409) using the SiMoA technology (Quanterix°).
Results: NF-L was increased in sarcopenic patients (median NF-L: 43.0 pg/mL) compared to controls (median NF-L: 21.1 pg/mL) (p-value: < 0.0001). We also observed a significant difference between subjects with high SPPB score (score: 10 – 12) (median NF-L: 19.5 pg/mL), intermediate SPPB score (score: 7 – 9) (median NF-L: 24.5 pg/mL) and low SPPB score (score: 0—6) (median NF-L: 27.7 pg/mL) (p-value: < 0.0001). The rank correlation gave a Spearman's rho of -0.267 (p-value < 0.0001). A significant correlation was also observed between appendicular lean mass/height^2 (ALM/h^2) and NF-L (rho: -0.200; p-value < 0.0001) but also between handgrip strength and NF-L (rho: -0.196; p-value = 0.0001). In a multiple regression after adjustment for potential confounding variables, NF-L was independently associated with SPPB score (p-value: < 0.0001) but not with ALM/h^2 or handgrip strength.
Conclusions: In this study, we showed that NF-L is increased in sarcopenic patients and is more particularly associated with SPPB score. Our results suggest that sarcopenia may share common features with neurodegeneration.

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CORTICAL PORE SIZE DISTRIBUTION AND VISCOELASTIC HUMAN TIBIA PROPERTIES DISCRIMINATE FRAGILITY FRACTURES INDEPENDENT OF BONE MINERAL DENSITY

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Objectives: Osteoporosis is a disorder of bone remodeling leading to reduced bone mass, structural deterioration, and increased bone fragility. The established diagnosis is based on the measurement of areal bone mineral density by dual energy x-ray absorptiometry (DXA), which poorly captures individual bone loss and structural decay. Enlarged cortical pores in the tibia have been proposed to indicate structural deterioration and reduced bone strength in the hip.
Material and Methods: In this cross-sectional study, we have assessed for the first time the cortical pore diameter distribution Ct.Po.Dm.D together with viscoelastic bone properties (i.e. slope and intercept of the frequency-dependent attenuation Ct.α_f and Ct.α_o) at the anteromedial tibia midshaft by means of a novel ultrasonic cortical backscatter (CortBS) technology. We hypothesized that the CortBS biomarkers are associated with the occurrence of fragility fractures in postmenopausal women (N = 55). The discrimination performance was assessed by means of multivariate PLS discrimination analyses with Leave-One-Out Cross-Validation (PLS-LOOCV) and benchmarked with models obtained from DXA and site-matched second-generation high-resolution peripheral computed tomography (HR-pQCT).
Results: The short-term precision of the individual CortBS parameter estimations was in the range between 1.7 and 13.9%. Ct.Po.Dm values were in the range between 20 and 62.8 µm. CortBS parameters were associated with subject's age ($R^2 = 0.45$), height ($R^2 = 0.36$), and marginally with weight ($R^2 = 0.25$) and *BMI* ($R^2 = 0.22$). We found a superior discrimination performance of CortBS (area under the receiver operating characteristic curve: $0.69 \leq AUC \leq 0.75$) compared to DXA ($0.53 \leq AUC \leq 0.55$) and a similar performance compared to HR-pQCT ($0.68 \leq AUC \leq 0.73$).
Conclusions: CortBS is the first quantitative bone imaging modality that can quantify viscoelastic and microstructural tissue deteriorations in cortical bone, which occur during normal aging and the development of osteoporosis. A widespread application of the method is anticipated to enable an early identification of people at increased risk, a timely initiation of preventive therapies, and subsequently to a reduction of the prevalence of fragility fractures in people with metabolic bone diseases.
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Disclosures: JM is employee of poroUS GmbH, a startup developing the CortBS technology. KR is inventor on the patent applications (EP3641657A1, US 2020/0129140, CN110769754A and JP 2019–570,514) describing the CortBS technology.

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IN HEALTHY MEN, EARLY DECLINE IN TRABECULAR BONE MINERAL DENSITY IS, IN PART, RELATED TO DECREASES IN SEX STEROIDS

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Introduction: Bone mass is known to decline in aging men and this decline is in part affected by sex steroid exposure. However, it is unclear how early after achieving peak bone mass bone loss begins and whether this decline is associated with sex steroid levels in young adulthood.