

World congress on osteoporosis, osteoarthritis and musculoskeletal diseases (WCO-IOF-ESCEO 2021): Committee of National Societies Abstracts

© International Osteoporosis Foundation and National Osteoporosis Foundation 2021

OCs1

PREVALENCE AND AGREEMENT BETWEEN RECENT SARCOPENIA DEFINITIONS: FINDINGS FROM FOUR POPULATION-BASED COHORTS

L. D. Westbury¹, H. E. Syddall¹, J. A. Cauley², P. M. Cawthon³, E. M. Curtis¹, K. E. Ensrud⁴, R. A. Fielding⁵, H. Johansson⁶, J. A. Kanis⁶, M. K. Karlsson⁷, T. Kwok⁸, N. Lane⁹, M. Lorentzon⁶, D. Mellström¹⁰, A. B. Newman², C. Ohlsson¹⁰, E. Orwoll¹¹, E. Ribom¹², B. E. Rosengren⁷, J. T. Schousboe¹³, E. J. Shiroma¹⁴, N. C. Harvey¹, E. M. Dennison¹, C. Cooper¹

¹MRC Lifecourse Epidemiology Unit, University of Southampton, Southampton, United Kingdom, ²Department of Epidemiology, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, United States, ³Research Institute, California Pacific Medical Center, San Francisco, California, United States, ⁴Medicine and Epidemiology & Community Health, University of Minnesota, Minnesota, United States, ⁵Nutrition, Exercise Physiology, and Sarcopenia Laboratory, Jean Mayer USDA Human Nutrition Research Center on Aging, Tufts University, Boston, United States, ⁶Mary MacKillop Institute for Health Research, Australian Catholic University, Melbourne, Australia, ⁷Clinical and Molecular Osteoporosis Research Unit, Department of Clinical Sciences Malmö, Lund University and Department of Orthopedics, Skane University Hospital, Malmö, Sweden, ⁸Department of Medicine & Therapeutics and School of Public Health, The Chinese University of Hong Kong, Hong Kong, China, ⁹Division of Rheumatology, Department of Internal Medicine, UC Davis Health, 4625 Second Avenue, Sacramento, CA 95917, United States, ¹⁰Centre for Bone and Arthritis Research (CBAR), Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden, ¹¹Oregon Health & Science University, Portland, Oregon, United States, ¹²Department of Surgical Sciences, University of Uppsala, Uppsala, Sweden, ¹³Park Nicollet Clinic and HealthPartners Institute, Bloomington, Minnesota, United States, ¹⁴Laboratory of Epidemiology and Population Sciences, Intramural Research Program, National Institute on Aging, Baltimore, United States

Objectives: The study aim was to assess, within each of four different population-based cohorts, prevalence of, and agreement between, two recent sarcopenia definitions, among older white men and women.

Material and Methods: Participants in the Health, Aging and Body Composition Study (Health ABC) ($n = 1734$, 52% men), Hertfordshire Cohort Study (HCS) ($n = 304$, 52% men), Osteoporotic Fractures in Men Sweden Study (MrOS Sweden) ($n = 2852$, 100% men) and the Osteoporotic Fractures in Men US Study (MrOS US) ($n = 5189$, 100% men) were analysed. Appendicular lean mass was ascertained using DXA; muscle strength by grip dynamometry; and usual gait speed was measured as a marker of mobility.

The sarcopenia definitions of interest were proposed by the Sarcopenia Definitions and Outcomes Consortium (SDOC) and the 2018 European Working Group on Sarcopenia in Older People (EWGSOP2). SDOC defines sarcopenia as having weak grip strength (<35.5 kg [men], <20 kg [women]) and slow gait speed (<0.8 m/s). EWGSOP2 defines sarcopenia as having weak grip strength (<27 kg [men], <16 kg [women]) and low appendicular lean mass index (<7.0 kg/m² [men], <5.5 kg/m² [women]). Cohen's kappa (κ) statistic was used to assess agreement between the definitions.

Results: Mean (SD) ages of participants were: Health ABC [74.3 (2.8) years]; HCS [75.4 (2.5)]; MrOS Sweden [74.9 (3.1)]; and MrOS US [73.8 (5.9)]. Prevalence of sarcopenia according to SDOC vs EWGSOP2 was as follows: Health ABC (men: 0.3% vs 1.5%, women: 1.0% vs 2.1%); HCS (men: 15.3% vs 0.0%, women: 19.0% vs 0.7%); MrOS Sweden (men: 1.0% vs 0.5%); and MrOS US (men: 1.5% vs 1.3%). Agreement was low between SDOC and EWGSOP2 ($\kappa < 0.2$ within each cohort).

Conclusions: Sarcopenia prevalence varied and agreement was low between SDOC and EWGSOP2. SDOC sarcopenia was more common in HCS than in Health ABC, perhaps due to the latter cohort's requirement for participants to have no mobility disability at enrolment. A consensus definition for sarcopenia is required.

OCs2

DETERMINANTS OF MUSCLE DENSITY IN LATE ADULTHOOD: FINDINGS FROM THE HERTFORDSHIRE COHORT STUDY

E. Laskou¹, L. D. Westbury¹, N. Nicholas¹, N. C. Harvey¹, H. P. Patel¹, C. Cooper¹, K. Ward¹, E. M. Dennison¹

¹MRC Lifecourse Epidemiology unit Southampton, Southampton, UK

Objective: In a recent meta-analysis, lower calf muscle density (indicating greater muscle adiposity and lower muscle quality) as assessed by pQCT was associated with greater hip fracture risk, independent of FRAX, falls and bone mineral density. To date, muscle density has been little studied, and its determinants are unknown. In this study, we used a well characterised cohort of older adults (Hertfordshire Cohort Study) to identify lifestyle and anthropometric determinants of muscle density some 11 y later.

Methods: At baseline, 197 men and 178 women, aged 59–70 y, were recruited to a longitudinal study of musculoskeletal health. A lifestyle questionnaire was administered to collect information on physical activity, smoking, alcohol consumption and dietary patterns; height and weight were measured. pQCT of the radius and tibia was performed a median of 11.5 (IQR 10.9, 12.3) y later, and muscle density was measured at the 66% site using standard methodology. Baseline

characteristics in relation to muscle density at follow-up were examined separately using linear regression with sex, baseline age and follow-up time included as covariates in all models.

Results: Mean (SD) age at baseline was 64.7 (2.7) y; mean (SD) muscle density values (mg/cm³) were as follows: forearm [men 79.9 (3.1), women 77.2 (3.2)], calf [men 80.7 (2.6), women 78.5 (2.6)]. Baseline correlates ($p < 0.05$) of both lower forearm and calf muscle density included female sex, lower weight, and lower BMI; SD difference in calf muscle density for women compared to men, and per SD lower weight and BMI were -0.84 [95%CI: -1.13, -0.54], -0.37 [-0.46, -0.27] and -0.31 [-0.40, -0.23] respectively. Additional correlates of lower calf muscle density included older age and shorter stature. Relationships between muscle density and age were stronger at the calf ($p < 0.001$) than the forearm ($p = 0.08$). Lifestyle measures were not associated with muscle density.

Conclusion: Female sex, older age, and lower adiposity, rather than lifestyle, were associated with lower muscle density in older community-dwelling adults. Age was more strongly associated with calf than forearm muscle density. Further studies in larger cohorts are required.

OCs3

FRAX BASED OSTEOPOROSIS MANAGEMENT PATHWAY FOR UKRAINIAN MEN

V. Povoroznyuk¹, H. Johansson², N. Grygorieva¹, M. Lorentzon³, A. Musienko¹, N. C. Harvey⁴, E. V. McCloskey⁵, E. Liu², J. A. Kanis⁵
¹D. F. Chebotarev Institute of Gerontology NAMS of Ukraine, Kyiv, Ukraine, ²Sahlgrenska Osteoporosis Centre, Institute of Medicine, University of Gothenburg, Gothenburg, Sweden, ³Mary McKillop Institute for Health Research, Australian Catholic University, Melbourne, Australia, ⁴MRC Lifecourse Epidemiology Unit, University of Southampton, Southampton, UK, ⁵Centre for Metabolic Bone Diseases, University of Sheffield Medical School, Sheffield, UK

Objective: Ukrainian FRAX model for Ukraine was launched in 2016 and intervention thresholds for women were published in 2019. The impact of intervention thresholds for Ukrainian men was not explored. The aim of this research was to assess the impact of the use of these thresholds in Ukrainian men.

Methods: 653 men (age 60.5 ± 11.8, range 40–88 y) referred as outpatients to the Dmitry F. Chebotarev Institute of Gerontology of the National Academy of Medical Sciences of Ukraine for the evaluation of skeletal status were studied. The 10-y probabilities of hip fracture and a major osteoporotic fracture were calculated using the Ukrainian FRAX model (version 4.2) with and without femoral neck BMD.

Results: 174 of 653 men (26.6%) had a prior fragility fracture and would be eligible for treatment on this basis. From the 479 males without a prior fracture, 447 were at low risk (68.5%) and were not be eligible for further assessment of fracture probability. The intermediate category of risk comprised 32 men (4.9%) in whom FRAX was recalculated with the inclusion of femoral neck BMD. Of these 23 were categorized at low risk (3.5%) and 9 at high risk (1.4%). Fracture probability calculated with BMD was higher than that without BMD. The disposition of the cohort in men was markedly different from that for women. 28% of men and 57% of women were eligible for antiosteoporotic treatment. The eligibility for treatment by FRAX alone was higher in women than in men (6.1 vs. 1.4% had a prior fragility fracture and were eligible for treatment). The requirement for BMD testing was also higher in women than in men (18.3 vs. 4.9%, respectively).

Conclusion: We have examined the assessment of fracture risk in Ukrainian men and compared their disposition with that of a referral population of women. 27% of men referred for skeletal assessment had a prior fracture that categorized eligibility for treatment, and this characteristic was less frequent than in Ukrainian women (51% of referrals).

OCs4

SEX DIFFERENCES IN THE ASSOCIATIONS BETWEEN CARDIOVASCULAR RISK FACTORS AND PHYSICAL FUNCTION: THE GAMBIAN BONE AND MUSCLE AGEING STUDY (GAMBAS)

A. Zengin¹, M. Ó Breasail², C. P. Parsons³, L. M. Jarjou⁴, R. E. Janha⁴, M. Jobe⁴, A. Prentice², C. Cooper³, P. R. Ebeling¹, K. A. Ward³
¹Dept. of Medicine, School of Clinical Sciences, Faculty of Medicine, Nursing and Health Sciences, Monash University, Clayton, Victoria, Melbourne, Australia, ²MRC Nutrition and Bone Health Group, Cambridge, UK, ³MRC Lifecourse Epidemiology Unit, University of Southampton, Southampton, UK, ⁴MRC Unit The Gambia at the London School of Hygiene and Tropical Medicine, Keneba, Gambia

Objective: In sub-Saharan Africa, the prevalence of obesity, cardiovascular disease (CVD) and impaired physical function are increasing due to rapid urbanisation. We investigated the associations between cardiac-workload, arterial stiffness, peripheral vascular calcification (PVC) and physical function in Gambian adults.

Methods: We recruited 249 women and 239 men aged 40–75 + y. Supine blood pressure and heart rate were measured and used to calculate rate pressure product (RPP) and pulse pressure (PP). Presence of PVC was determined from tibia pQCT scans. Physical function was assessed by a force platform to measure muscle force (kN) and power (kW) during a chair rise test (CRT) and single 2-leg-jump (s2LJ); hand dynamometer measured hand grip strength (HGS). Body composition was assessed with DXA; body size corrections were made by dividing by height squared (kg/m²) giving fat mass index (FMI) and appendicular lean mass index (ALMI). Sex-interactions were tested (denoted as p-int) after adjustment for age and height. Data are expressed as 10% percent difference in RPP or PP, per one-unit difference in physical functions measures. Values are β-coefficients with 95% confidence intervals. Mediation analyses were performed with the mediator as ALMI/FMI.

Results: Mean age was similar in women (61 ± 13 y) and men (61 ± 12 y). BMI was higher in women vs. men (21.9 ± 3.7 vs. 20.9 ± 3.1, $p = 0.0009$). There was a greater negative association between RPP and s2LJ power after adjustments in men (-0.02 kW: -0.05, 0.03) vs. women (0.04 kW: 0.004, 0.08), p -int = 0.017; with no other significant interactions. In men, there were greater negative associations between PP and CRT power (-0.008 kW), s2LJ power (-0.03 kW) and HGS (-0.48 kg) vs. women (all p -int < 0.01). In men, presence of PVC was associated with lower s2LJ power (-0.2 kW: -0.4, 0.02, p -int = 0.037) and HGS (-2.3 kg: -4.2, -0.4, p -int = 0.016). In men, FMI mediated the association between RPP and CRT power ($p = 0.002$), s2LJ force ($p < 0.001$) and s2LJ power ($p = 0.001$). There was no significant mediation by ALMI; there were no mediation by ALMI or FMI in women.

Conclusion: Multiple markers of CVD were associated with poorer physical function in men, and these were mediated by FMI. There is a need to identify preventative strategies to slow/prevent the rising burden of CVD and poor physical function in sub-Saharan Africa.

OCs5

VITAMIN D STATUS AND ASSOCIATED VDR GENE POLYMORPHISM IN BELARUSIAN POSTMENOPAUSAL WOMEN

P. Marozik¹, E. Rudenka², K. Kobets¹, A. Rudenka³, V. Samokhovec³
¹Institute of Genetics and Cytology of the National Academy of Sciences of Belarus, ²Belarusian State Medical University, ³Belarusian Medical Academy of Post-Graduate Education, Minsk, Belarus

Objective: Vitamin D plays an important role bone diseases prevention, including osteoporosis (OP). The biological action of vitamin is realized through its receptor, coded by *VDR* gene. Therefore, *VDR* gene polymorphism can influence vitamin D supplementation

effectiveness. The objective of this work was to reveal the effects of *VDR* gene ApaI rs7975232, BsmI rs1544410, TaqI rs731236, FokI rs2228570 and Cdx2 rs11568820 variants on 25(OH)D level in Belarusian women with OP.

Methods: Patients were recruited at 1st Minsk city clinic (Minsk, Belarus). In total, 602 women met inclusion criteria, of them 355 patients with OP and 247 subjects from control group. BMD was evaluated by DXA (GE Lunar, USA), serum vitamin D was determined by electrochemiluminescence immunoassay (Cobas e411, Roche, Switzerland). *VDR* gene variants markers were determined using the quantitative PCR.

Results: We revealed significant association of rs1544410, and rs731236 gene variants with 25(OH)D level, which is gene/dose dependent: the lowest vitamin level was typical for reference genotype, intermediate – for heterozygotes and the highest – for the bearers of minor homozygous genotypes ($P < 0.01$). The opposite gene/dose relationship was revealed for rs11568820 variant. We also assessed the distribution of each *VDR* variant genotypes in different groups of study participants according to vitamin D level (defined as sufficient, insufficient, deficient). Using χ^2 -test, a significant difference in genotype distribution between groups was revealed only for rs731236 variant ($\chi^2 = 12.8$, $P = 0.012$, Figure). The G/G genotype was over-represented in group of participants with “sufficient” state, while A/A genotype was associated with vitamin D deficiency.

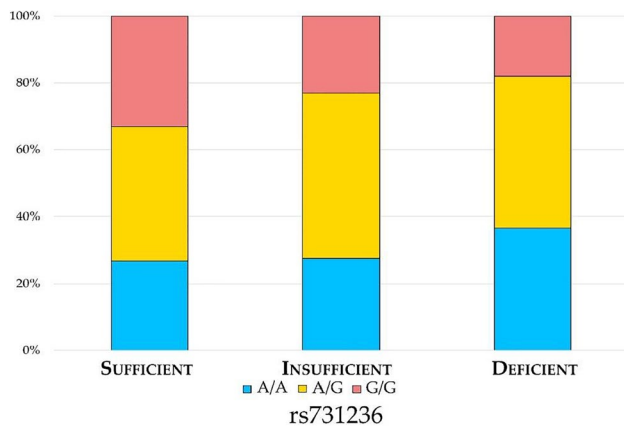


Figure. The association of serum 25(OH)D levels with *VDR* rs731236 genotype distribution in groups based on vitamin D status.

Conclusion: The data shows that the increased level of circulating 25(OH)D is observed in bearers of unfavorable *VDR* genotypes, associated with decreased receptor expression, possibly due to altered metabolic feedback loops or effectiveness of vitamin metabolism. *VDR* gene variants should be considered for personalized vitamin D supplementation.

OCs6

SOFT BONE IS WEAK: PROSPECTIVE, BLINDED INTRAOPERATIVE ASSESSMENT OF BONE CORRELATES WITH T-SCORE

B. Nickel¹, D. Krueger¹, G. Borchardt¹, L. Andersen¹, R. Illgen¹, D. Hennessy¹, N. Binkley¹, P. Anerson¹

¹University of Wisconsin, Madison, USA

Objective: Intuitively, intraoperative physician assessment (IPA) of bone would be an excellent measure of quality as surgeons gain insight into bone strength through haptic feedback while bone preparation is performed. However, no studies evaluate a surgeon’s ability to do so. Our purpose was to investigate IPA of bone quality in patients

undergoing total knee arthroplasty (TKA) with a) lowest T-score BMD b) custom regions of interest (ROI) in distal femur BMD.

Methods: Prospectively, 70 patients identified as primary TKA candidates by 3 surgeons received pre-operative DXA (spine, hip, wrist, VFA and TBS). Intraoperatively, the surgeon assessed bone quality on a 5 point scale based on tactile feedback to resistance with preparation: 1 = excellent, 2 = above average, 3 = normal, 4 = below average and 5 = poor. This IPA was recorded in the operative note. Demographic data, DXA results and IPA scale between surgeons was compared by factorial ANOVA. Lowest T-score (L-spine, femoral neck/total hip and 3 radius) and custom regions were correlated to IPA using Spearman’s correlation.

Results: Mean IPA was 2.74 ± 1.2 with no statistical difference ($p = 0.284$) between surgeons. Demographic data, BMD, and lowest T-score of patients (38 surgeon A, 25 surgeon B and 7 surgeon C) not differ between surgeons. Mean age was 65.8 ± 7.6 y and BMI 31.4 ± 5.1 kg/m². IPA directly correlated with lowest T-score ($R = 0.482$) and ROI ($R = 0.587-0.645$). Based on lowest T-score, no patients with osteoporosis were classified as above average bone quality and none with normal BMD were classified as having poor bone.

Conclusion: Novel IPA provides valuable information that can identify patients with below average/poor bone quality and expedite treatment ideally decreasing periprosthetic fracture risk. Reproducibility between three surgeons highlights potential for universal implementation and future studies may validate IPA in hip replacement aiding implant fixation selection.

OCs7

THE EFFECT OF CALCIUM AND VITAMIN D3 ON CALCIUM HOMEOSTASIS AND FALLS INCIDENCE IN PATIENTS WITH HIGH FRACTURE RISK UNDERGOING MEDICAL REHABILITATION

L. Marchenkova¹, V. Vasileva¹

¹National Medical Research Center of Rehabilitation and Balneology” of Ministry of Health of Russian Federation, Dept. of Somatic Rehabilitation, Moscow, Russia

Objective: Vitamin D and calcium deficiencies is of particular importance in older patients undergoing medical rehabilitation and having a high risk of fractures. Preventing falls and fractures, including during the course of rehabilitation, is an important challenge that can be addressed in these patients, in particular through improved nutrition and vitamin D and calcium supplementation. This study aimed to evaluate the effect of long-term calcium and vitamin D3 intake on calcium homeostasis and fall’s rate in patients with high fracture risk starting rehabilitation course.

Methods: The study enrolled 119 men and women aged 50–80 y.o. with high absolute fracture probability by FRAX who started medical rehabilitation. 41 patients have been receiving antiresorptive therapy already comprised group 1, other patients were randomized into groups 2 ($n = 39$) and 3 (control, $n = 39$). In groups 1 and 2, a food supplement containing calcium citrate 1000 mg and vitamin D3 600 IU was prescribed for 12 months. All patients undergo laboratory examination, food calcium intake and fall assessment at baseline, in 6 and 12 months.

Results: Daily calcium intake in the study sample ($n = 119$) was 782.9 ± 243.4 mg. Vitamin D deficiency was detected in 38.4% of the examined. An increase in 25(OH)D level was noted in groups 1 and 2 after 6 and 12 months ($p < 0.01$). Patients in group 1 showed an increase in serum osteocalcin and calcium levels after 6 and 12 months ($p < 0.05$). In group 3, there was an increase of immunoreactive PTH levels after 6 ($p < 0.05$) and 12 months ($p < 0.01$), C-terminal telopeptide of type I collagen level and alkaline phosphatase activity after 12 months ($p < 0.05$). In group 1, there was also a decrease in proportion of patients who fell after 6 months ($\chi^2 = 4.97$, $p = 0.026$) and a decrease in the total number

of falls after 12 months ($\chi^2=4.89$, $p=0.027$). Group 2 showed a decrease in the number of patients who fell after 6 and 12 months ($\chi^2=48.58$, $p=0.0034$ at both stages of the study) and the number of falls in general after 6 months ($\chi^2=6.02$, $p=0.0142$).

Conclusion: The obtained data allow us to recommend prescription of dietary supplements containing calcium and vitamin D3 as a part of complex rehabilitation of patients with high fracture risk.

OCs8

IMPROVING COMMUNICATION OF FRACTURE RISK GLOBALLY: INSIGHTS FROM INTERVIEWS WITH PATIENTS. THE RISKCOMMUNICATION STUDY OR RICO STUDY

C. Beaudart¹, S. Silverman², Z. Paskins³, A. Boonen⁴, J.-F. Kaux⁵, S. Fujiwara⁶, M. Hilgsmann¹

¹Dept. of Health Services Research, CAPHRI Care and Public Health Research Institute, Maastricht University, Maastricht, The Netherlands, ²Cedars-Sinai Medical Center, Los Angeles, USA, ³School of Medicine, Keele University, Staffordshire, UK, ⁴Dept. of Internal Medicine, Division of Rheumatology and CAPHRI Care and Public Health Research Institute, Maastricht University Medical Center, Maastricht, The Netherlands, ⁵Physical Medicine, Rehabilitation and Sports Traumatology, University and University Hospital of Liège, Liège, Belgium, ⁶Dept. of Pharmacy, Yasuda Women's University, Hiroshima, Japan

Objective: Lack of or low quality communication between patient and healthcare provider may partially explain poor initiation and adherence to anti-osteoporosis treatment. In this study, we aimed to gain insights into patients' understanding and preferences for various approaches for communication of fracture risk, derived from a risk algorithm, with the goal of improving osteoporosis treatment and management.

Methods: Individual physical or online interviews with patients at risk for fractures were organized in 4 different countries (Belgium, The Netherlands, United States and Japan). A semi-structured workbook developed following a scoping literature review and experts insight was used to conduct interviews. Using an example of a personal risk of 21% for any fracture in the next 10 y, four main fracture risk presentations were used to guide these interviews: verbal/written presentation of the percentage fracture risk, various types of coloured graphs, icon arrays, and icon arrays with or without treatment effect on fracture risk. Patients were asked to critically reflect on the different framing presentations for fracture risk, to suggest alternatives for improvement and to rank their preference.

Results: A total of 26 women (mean age of 70.5 y) at risk for fractures participated in the study. Thirteen (50%) had an history of fracture, 18 (69.2%) were on antiosteoporosis medication and 4 (15.4%), 11 (42.3%), 5 (19.2%) considered themselves at low, moderate and high risk of fracture respectively. Most patients (76.9%) preferred coloured graphs over other presentations. Icon arrays of baseline fracture risk were never a preferred method of risk communication. Most patients also reported that presenting the risk of fracture with and without treatment would be more convincing to initiate a treatment. Participants also suggested that fracture risk communication should be supported with additional data, such as the consequences of fractures. Most patients would value the development of a visual tool to better understand fracture risk.

Conclusion: Insights from these interviews suggest the importance of a patient-centered approach to fracture risk communication. A larger global survey is currently being developed to provide additional insights into patients' understanding and preferences for fracture risk communication and assess potential cultural and geographical differences in the optimal way to communicate fracture risk.

Acknowledgements: Amgen, Inc. funded this investigator initiated study. *The RICO project is endorsed by the Epi/QOL working group.

OCs9

OSTEOPOROSIS IN MIDDLE-AGED WOMEN: WHAT IS THE IMPACT OF MULTIMORBIDITY AND MEDICATION USE? A CROSS-SECTIONAL POPULATION-BASED STUDY

A. V. Gueldini de Moraes¹, L. H. Costa-Paiva¹, A. O. Pedro¹

¹UNICAMP, Campinas, Brazil

Objective: Osteoporosis is a multifactorial disease influenced by many clinical factors. Some of these factors are nonmodifiable, while others can be avoided, ameliorated and prevented. From the perspective of the middle-aged women and their physician, this is of importance since longevity and aging process is associated to chronic conditions, medication use and multimorbidity that may affect bone health. Many of these chronic diseases may affect women during the menopause transition. Therefore, it is important to know which medications are most used by middle-aged women and which ones can potentially have adverse skeletal effects. This study aimed to evaluate the association between self-reported osteoporosis and multimorbidity and medication use, in Brazilian middle-aged women.

Methods: A secondary analysis of household survey data from a previous cross-sectional, population-based study conducted with a sample of 749 women of a population of 257,434 female urban residents in the age bracket of interest (45–60 y). Associations between self-reported osteoporosis and chronic diseases, multimorbidity, and medication use were evaluated. Simple and multiple Poisson regression analyses (with a forward stepwise selection of variables) were performed to evaluate the significance of the factors associated with self-reported osteoporosis (95%CI for the prevalence ratio). The level of statistical significance was set at 5%.

Results: Mean age of participants was 52.5 ± 4.4 y. Mean age at menopause was 46.5 ± 5.8 y. About 79% of women reported having some kind of chronic disease. The most prevalent morbidities were hypertension (36%), depression (34%), anxiety (27%), osteoarticular diseases (27%), dyslipidemia (22%), asthma (10.5%), and diabetes mellitus (10.4%). Only 21.6% denied having morbidities. The prevalence of self-reported osteoporosis was 7.3%. Among those women with osteoporosis, 67.3% reported using specific drugs to treat bone loss. The specific intake of drugs for osteoporosis treatment correspond to 7.6% of the overall prevalence of medication use. Only 6% of the entire studied population reported using calcium and vitamin D supplementation. The overall prevalence of medication use was 68.8%, with the drugs predominantly consisting of those used for cardiovascular diseases (34.6%), oral lipid-lowering agents (13%), anxiolytics (12%), treatment of osteoarticular diseases (12%), and treatment of diabetes (9.6%). Only 19.5% of the participants reported previous or current use of hormone replacement therapy. The overall frequency of polypharmacy was 23%. After multiple regression analysis, the main factors associated with self-reported osteoporosis were having osteoarthritis/osteoarthritis (PR = 2.86; 95%CI: 1.58–5.17; $p \leq 0.001$), multimorbidity (PR = 2.61; 95%CI: 1.43–4.75; $p = 0.002$), and treatment for ischemic heart disease (PR = 3.28; 95%CI: 1.02–10.56; $p = 0.046$). Strength & limitations: This observational study provides an epidemiological contribution. The meticulous methodology and the representativeness of the population sample permit these conclusions to be extrapolated to the entire population of middle-aged women residing in the metropolitan region of Campinas, Brazil. Some limitations of this study must be considered, particularly bearing in mind that much of the data was self-reported, which may lead to biases.

Conclusion: The prevalence of morbidities and medication use among middle-aged women was high in a relatively young population. Osteoporosis was reported by approximately 8% of women, highlighting

the importance of menopause transition. However, only 2/3 of the osteoporotic women reported using specific drugs for its treatment. Furthermore, it was observed a low prevalence of calcium and vitamin D supplementation. Women with self-reported osteoporosis were more likely to use medicine for ischemic heart disease, to have osteoarticular disease, besides having multimorbidity. Our findings reinforce the need to address women earlier, preferably in the period before the menopausal transition, to promote health through lifestyle modifications, thus preventing the onset of chronic degenerative diseases at earlier ages. Furthermore, clinicians should be aware to select drugs for the treatment of chronic conditions in this specific group of women, considering the potential side effects on bone health.

Acknowledgement: São Paulo Research Foundation—FAPESP 2016/08089-9.

OCs10

INFLUENCE OF BARIATRIC SURGERY ON 25-OH-VITAMIN D AND PTH IN OBESE PATIENTS

S. H. Scharla¹, U. G. Lempert¹

¹Practice Endocrinology & Diabetes, Bad Reichenhall, Germany

Objective: Obesity is associated with vitamin D deficiency and potential calcium malabsorption. Bariatric surgery is performed for the treatment of obesity with increasing frequency, but may aggravate malabsorption and increase the risk of osteoporosis and fractures. Therefore, supplementation of vitamin D (alongside with minerals and other vitamins) is part of the follow-up program after bariatric surgery. We present data on the vitamin D status and PTH before and after bariatric surgery.

Methods: We studied 23 obese patients before bariatric surgery and 25 patients after bariatric surgery. 25-OH-Vitamin D was used as an estimate for vitamin status. 25-OH-vitamin D and PTH were measured by the automated methods of Roche Diagnostics (Mannheim) using a COBAS 411 platform. Clinical Chemistry (calcium, phosphate, alk. phosphatase, creatinine) were measured by routine standard methods. Group differences were evaluated with t-test and Pearson correlation analyses were done.

Results: The BMI in the group before surgery was 49.9 ± 8.4 kg/m², and after surgery 34.6 ± 7.8 kg/m² (mean \pm SD), $p < 0.001$. The age of the patients was 40.9 ± 10.7 y. 25-OH-vitamin D serum concentrations were 49.9 ± 21.8 nmol/l and 72.7 ± 37.3 nmol/l after surgery ($p < 0.05$). The physiological range for 25-OH-vitamin D is 50–125 nmol/l. PTH was 23.2 ± 17 ng/l before surgery and 36.7 ± 19.2 ng/l after surgery ($p < 0.05$), the normal range for PTH being 10–65 ng/l). There was a significant negative correlation between BMI and 25-OH-vitamin D in patients before surgery ($r = -0.46$, $p = 0.03$). After surgery, this relationship was not significant anymore ($r = -0.17$, $p = 0.41$). There was no significant correlation between BMI and PTH. 25-OH-vitamin D and PTH were negatively correlated. This correlation was not significant before surgery ($r = -0.36$, $p = 0.09$), but after surgery ($r = -0.39$, $p = 0.05$).

Conclusion: Obese patients displayed vitamin D insufficiency, as has been described in former studies. The vitamin D status was significantly improved after bariatric surgery, which resulted also in a substantial weight loss. Since 25-OH-vitamin D is negatively correlated with BMI, the reduction in BMI may explain the increase in 25-OH-vitamin D. However, the widely used vitamin supplementation after surgery may also contribute to the better vitamin D status.

OCs11

PATIENT'S PREFERENCES FOR LIFESTYLE CHANGES IN OSTEOPOROTIC FRACTURE PREVENTION: A CROSS-EUROPEAN DISCRETE-CHOICE EXPERIMENT

C. Beaudart¹, A. Boonen², N. Li¹, S. Bours¹, S. Goemaere³, J.-Y. Reginster⁴, C. Roux⁵, B. McGowan⁶, A. Diez-Perez⁷, R. Rizzoli⁸, C. Cooper⁹, M. Hiligsmann¹

¹Department of Health Services Research, CAPHRI Care and Public Health Research Institute, Maastricht University, Maastricht, The Netherlands, ²Department of Internal Medicine, Division of Rheumatology and CAPHRI Care and Public Health Research Institute, Maastricht University Medical Center, Maastricht, The Netherlands, ³Department of Rheumatology and Endocrinology, Ghent University Hospital, Ghent, Belgium, ⁴WHO 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, ⁵Department of Rheumatology, Paris Descartes University, Paris, France, ⁶The North Western Rheumatology Unit, Our Lady's Hospital, Manorhamilton, Manorhamilton, Ireland, ⁷Musculoskeletal Research Unit (IMIM) and CIBERFES, Universitat Autònoma de Barcelona, Barcelona, Spain, ⁸Division of Bone Diseases, Geneva University Hospitals, Geneva, Switzerland, ⁹MRC Lifecourse Epidemiology Unit, University of Southampton, Southampton General Hospital, Southampton, United Kingdom

Objective: Healthy lifestyle habits are recommended for preventing osteoporotic fracture, alongside drug therapy. In this study, we aimed to assess patients' preference to adopt lifestyle changes to prevent osteoporotic fractures.

Methods: A discrete-choice experiment was conducted in seven European countries: Belgium, France, Ireland, Spain, Switzerland, the Netherlands and United Kingdom. Patients were repetitively asked if they would closely follow different regimens of lifestyle recommendations that varied with respect to 6 attributes and different levels (options): physical activity (levels: not included, moderate or high), calcium and vitamin D status (levels: not included, taking supplements or improve nutrition and assure a minimal daily sunlight exposure), smoking (levels: not included or quit smoking), alcohol (levels: not included or moderate consumption), weight reduction (levels: not included or ensure a healthy body weight) and fall prevention (levels: not included, receive general advice or following a one-day prevention program). A conditional logit model was used to estimate patient's preferences for all participants (global model) and per country.

Results: In total, 1042 patients completed the questionnaire, with samples varying between 91 and 244 per country. Overall, patients were favourable to lifestyle changes for preventing osteoporotic fractures (positive and significant coefficients in the global model as well as in all countries separately). However, among the lifestyle factors proposed, consensually across all countries, patients were not prone to engage in high physical activity (i.e. walking for 30–40 min, 3–4 times per week or equivalent). In Ireland, Belgium, the Netherlands and Switzerland, patients were not favourable neither to follow a one-day falls prevention program. Belgian, Swiss and Dutch patients were not prone neither to modify their nutrition (i.e. diet rich in calcium and consumption of fish at least twice a week) and ensure a 10–15 min daily sunlight exposure. In the global model as well as for Belgian and Dutch patients separately, we observed favourable intention from patients to reduce their alcohol consumption, engage in moderate physical activity, taking calcium and vitamin D supplements and ensure a normal body weight for preventing fractures.

Conclusions: Patient's healthy lifestyle behaviours are essential for an optimal osteoporosis management. This is the first study that explicit patients' preferences for lifestyle factors in preventing osteoporotic fracture. In an ideal patient-centred approach, fracture prevention should take these considerations and preferences into account.