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GENOME-WIDE ASSOCIATION STUDY OF TRABECULAR BONE SCORE IN OLDER ADULTS: THE BUSHEHR ELDERLY HEALTH (BEH) PROGRAM

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Objective: This study was conducted to identify single nucleotide polymorphisms (SNPs) related to the trabecular bone score (TBS) in the elderly population of Bushehr, a southern province of Iran.

Methods: A genome-wide association study was performed on TBS in 2161 participants of the BEH cohort, a population-based cohort study. We investigated the association of more than 8.2 million SNPs with TBS of each lumbar spine from L1 to L4, as well as the mean of the four of them using a linear mix model. Adjustment was made for age, sex, and the first ten principal components. The genotype data were analyzed using the GCTA version 1.91.

Results: The number of genome-wide significant SNPs and loci were 30 and two for TBS L3. The most significant association was between rs77251236 (20p13, 18 kb upstream SLC23A2) and TBS L3 ($p = 2.31 \times 10^{-9}$). The findings explain 15 percentage of the genetic variance for TBS L3. We did not find any genome-wide significant SNPs for TBS L1, L2 and, L4.

Conclusion: The current study identified new loci associated with trabecular bone score, which were located near genes such as SLC23A2 and PCNA. PCNA has an important role on bone health and SLC23A2 may affect the trabecular bone formation trough the encoded protein accounts for tissue-specific uptake of vitamin C.
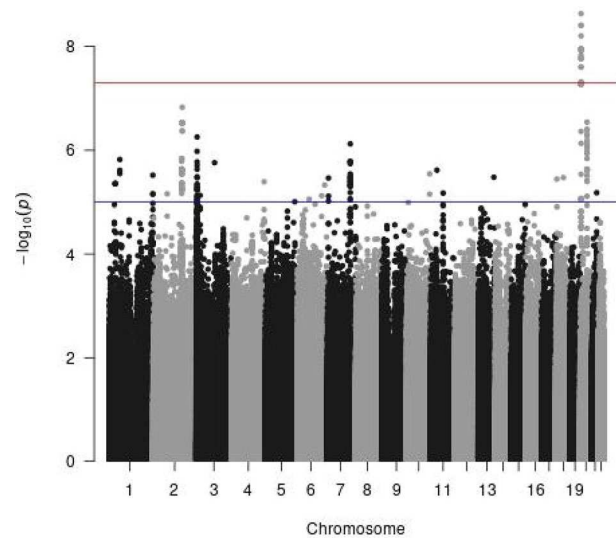
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INTRINSIC CAPACITY USING THE MNA-SF AND THE GLOBAL LEADERSHIP INITIATIVE OF MALNUTRITION (GLIM) CRITERIA IN THE NUTRITIONAL DOMAIN AND MORTALITY-RISK: A 9-YEAR FOLLOW-UP IN THE SARCOPHAGE COHORT

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Objective: Intrinsic capacity (IC) was developed in 2016 and is composed by five domains: sensorial, locomotor, nutritional, cognitive, and psychological domain. We aimed to estimate the ability of IC to predict death in community-dwelling older people using different criteria to define the IC nutritional domain.

Methods: The prospective, population-based *Sarco*penia and *Phy*sical Impairment with advancing *Age* (SarcoPhAge) cohort included 534 community-dwelling participants $\geq$ 65-year-old and followed them from 2013 to present (mean follow-up: 9.3 ± 0.3 years). Outcome: death at 9-year follow-up, collected from medical records. Four IC domains were assessed at baseline (the sensory IC not collected in the SarcoPhAge study), and considered unsatisfactory when their score was below each assessment tool's threshold (for locomotor IC: Short Physical Performance Battery $\leq$ 8 points, for cognitive IC: Mini-Mental State Examination $\leq$ 26 points, and for psychological IC: Geriatric Depression Scale $\geq$ 5 points). The nutritional domain was considered unsatisfactory if both screening (MNA-SF $\leq$ 11 points) and diagnosis (GLIM criteria) were met. Appendicular lean mass/height^2 (reduced if < 7 kg/m^2 in men and < 5.5 kg/m^2 in women, measured by DXA) was considered for the reduced muscle mass phenotypic criterion. The association among baseline unsatisfactory IC domains and 9-year mortality-risk was calculated using odds ratio (OR) and 95% CI, adjusted for cofounders.

Results: From the 534 participants recruited at baseline (73.5 ± 6.2 years old; 60.3% women), 157 (29.4%) were death after a 9-year follow-up period. Patients with baseline unsatisfactory IC were at higher risk of death. The highest association with mortality was shown in participants with a baseline unsatisfactory IC nutritional domain (adjusted-OR = 3.27 [95% CI 1.72-6.23]). Other IC domains

were also predictive of death: adjusted-OR = 2.31 [95% CI 1.38–3.86] for unsatisfactory locomotor domain, adjusted-OR = 1.47 [95% CI 0.86–2.51] for unsatisfactory cognitive domain, and adjusted-OR = 1.78 [1.12–2.83] for unsatisfactory psychological domain.
Conclusion: Presenting any of these four IC domains unsatisfactory at baseline was associated to a higher 9-year mortality-risk in community-dwelling older people. The sequential screening by MNA-SF and diagnosis by GLIM criteria, used to define an unsatisfactory IC domain, was associated to 3.5-fold higher mortality-risk. Incorporating the reference operational definition of malnutrition as IC nutritional domain could be helpful to guide Public Health Actions towards Healthy Aging.

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SCREENING FOR MALNUTRITION BY THE MNA-SF, DIAGNOSIS BY THE GLOBAL LEADERSHIP INITIATIVE ON MALNUTRITION (GLIM) CRITERIA, OR BOTH? PREDICTIVE CAPACITY FOR MORTALITY IN A 9-YEAR FOLLOW-UP IN THE SARCOPHAGE COHORT

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Objective: Evidence have highlighted a higher risk of death in people with malnutrition. However, in the scientific community, different approaches have been proposed to screen or diagnose malnutrition. Moreover, the GLIS and ESPEN have recently recommended several ways to define a reduced muscle mass, one of the criteria used in the diagnosis of malnutrition. In this study, we aimed to explore the predictive risk of death of malnutrition, when muscle mass is measured with those different recommended approaches.
Methods: The prospective, population-based Sarcopenia and Physical Impairment with advancing Age (SarcoPhAge) cohort included 534 community-dwelling participants ≥ 65-year-old and followed them from 2013 to present (mean follow-up: 9.3 ± 0.3 years). Outcome: 9-year death, collected by medical records. DXA and anthropometry were used for muscle mass assessment. Baseline malnutrition was defined by: 1)MNA-SF ≤ 11; 2)GLIM criteria incorporating in the muscle mass criterion, 2.1)appendicular lean mass(ALM)/height^2 (ALMI), 2.2)ALM/weight, 2.3) ALM/BMI, 2.4)ALM alone (GLIS), 2.5)ESPEN-endorsed calf-circumference, 2.6)calf-circumference, 2.7)mid-arm circumference, and 3)MNA-SF ≤ 11 + GLIM criteria with ALMI. The association between baseline malnutrition and 9-year mortality-risk was calculated using odds ratio (OR) and 95% CI, adjusted for cofounders. Diagnostic accuracy and concordance for all techniques were calculated.
Results: From the 534 participants recruited at baseline (73.5 ± 6.2 years old; 60.3% women), 157 (29.4%) were death after a 9-year follow-up period. Prevalence of baseline malnutrition ranged from 10.9% (MNA-SF + GLIM with ALMI) to 23.9% (GLIM with ALM/BMI). Participants with baseline malnutrition showed higher mortality-risk, ranging from adjusted-OR = 1.77 (95% CI 1.10-2.85) for GLIM criteria with ALM/BMI to adjusted-OR = 3.27 [95% CI 1.72-6.23], for MNA-SF ≤ 11 + GLIM criteria with ALMI. Diagnostic performance indicators and concordance for all techniques were good and strong, respectively, except for the MNA-SF (low-to-moderate agreement).
Conclusion: Malnutrition identified by MNA-SF and the GLIM criteria, predicted two-to threefold higher mortality. All the GLIS and ESPEN recommended techniques for muscle mass assessment ensured an accurate diagnosis. The sequential screening and diagnosis

showed the highest predictive capacity for mortality and its combined use could be helpful to guide Public Health Actions on nutritional care in community-dwelling older people.

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ASSOCIATION BETWEEN OSTEOPOROSIS SCREENING AND FRACTURE OUTCOMES IN OLDER SWEDISH WOMEN

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Objective: As a result of the ageing population, the burden of osteoporotic fractures is increasing and case finding strategies to identify those at high risk to reduce fracture risk are highly warranted. The objective of this study was to investigate treatment rates and fracture outcomes in older women 1) diagnosed with osteoporosis, with subsequent referral to their general practitioner, and 2) women with severe osteopenia, who were not referred to their general practitioner.
Methods: In total, 3028 women, 75-80 years old were included in the Sahlgrenska University hospital Prospective Evaluation of Risk of Bone fractures (SUPERB) study. At inclusion, 411 women were diagnosed with osteoporosis (T-score ≤ -2.5) at the spine or hip, did not have current or recent osteoporosis treatment, and were therefore referred to their primary care physician for evaluation (referral group). A control group of 217 women with severe osteopenia (T-scores between ≤ -2.3 and > -2.5) at the spine or hip was selected. Cox regression (hazard ratios (HR) and 95% CI) analyses were performed to investigate the risk of fractures.
Results: During a median follow-up time of 6.6 years there were 76 MOFs (35%) in the control group and 106 MOFs (26%) in the referral group. The risk of MOF was significantly reduced (HR = 0.64, 95% CI [0.47-0.87]) in the referral group compared to the control group. Similarly, the risks of hip fracture (HR = 0.39, [0.22-0.70]) and any fracture (HR = 0.69, [0.52-0.91]) were lower in the referral group. During follow-up, there was a fourfold increase (HR = 4.24, [3.27-5.51]) in prescription of osteoporosis medication in the referral group compared to the control group.
Conclusion: Screening older women for osteoporosis and referring those with osteoporosis diagnosis was associated with substantially increased treatment rates and reduced risk of any fracture, MOF and hip fracture.

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EXPECTED PATIENT BENEFIT AND BUDGET IMPACT OF FRACTURE LIAISON SERVICE IMPLEMENTATION IN THE RUSSIAN FEDERATION

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Objective: We set out to estimate the patient benefit and budget impact over five years of Fracture Liaison Services (FLS) implementation in the Russian Federation at the country level as compared to local current practice.
Methods: A microsimulation model was used to simulate the pathway of individual men and women aged 50 + with a fragility fracture under current practice and under a scenario of wider FLS