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Commentary

The Connections of Biomarkers between the Risk of Osteoporosis and Sarcopenia

Kai Zhu*

Department of Orthopedics, Shanghai Jiaotong University School of Medicine, Shanghai, China

DESCRIPTION

Osteoporosis and sarcopenia are two common and overlapping geriatric situations that might lead to a high risk of fractures and a low quality of life in the elderly population. Roughly 210 million individuals will experience the effects of osteoporosis. Due to the seriousness of the results, early screening and diagnosis, prevention and intervention for osteoporosis and the risk of fracture are critical. Although, the clinical analysis is hampered by three critical challenges in the assessment of muscle and bone status. First, dual-energy X-Ray Absorptiometry (DXA), Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) imaging modalities give a goal and adequately reliable estimation of body composition. BIA is a regularly utilized feasible tool that is suggested by the AWGS and EWGSOP for local area sarcopenia evaluation. Nonetheless, the use of BIA is additionally restricted in old people, who will generally be dehydrated. Second, the repeatability of the assessment techniques is poor. The main assessments for muscle capability include common gait speed and the Short Physical Performance Battery (SPPB). Third, osteoporosis and sarcopenia are chronic diseases, and not all people show a similar rate of muscle and bone loss. To overcome the deficiency methods to evaluate muscle and bone, a pool of serum biomarkers was recently developed in view of the molecular biological mechanisms of their contribution to the pathogenesis of sarcopenia and osteoporosis, for example, endocrine framework, development factors, and muscle protein turnover. Nonetheless, whether these biomarkers genuinely reflect the condition of bones and muscles was not checked. To investigate the connection between biomarkers and bones and muscles, we recognized biomarkers of osteoporosis and sarcopenia as indicated by various pathophysiological systems. (1) Myokines (e.g., myostatin, follistatin, oxytocin, and brain-derived neurotrophic factor). Myostatin is a changing development factor-beta (TGF-β) superfamily member and a significant negative regulator in skeletal muscle development.

Follistatin is a strong inhibitor of myostatin and acts through activin/myostatin signaling. Myostatin and follistatin are closely connected with muscle metabolism and influence bone activities through different pathways. Oxytocin is basically produced by the hypothalamus and kept in the neurohypophysis, supporting maintenance and repair of skeletal muscle, and age-related decrease in oxytocin adds to sarcopenia. (2) Sex Hormones. Musculoskeletal regulation is for the most part intervened by mechanical stress stimulation. However, steroid hormones, for example, Dehydroepiandrosterone (DHEA), estradiol (E2), and testosterone (T2) increase first, which recommends that the connection between muscle action and bone resorption is directed by sex steroids. Sex hormones are known for their antiaging properties of expanding lean body mass and bone mineral density. The serum myokines and sex hormones are firmly connected with bone mass, muscle mass, and strength and are predictive risk factors for bone and muscle loss in the elderly.

Osteoporosis, sarcopenia and osteosarcopenia are skeletal and muscle diseases in the elderly. To additionally confirm the clinical application value of biomarkers, we compared serum biomarker levels in the four classes of postmenopausal ladies with various bone muscle statuses and analyzed the connections of biomarkers with the risk of osteoporosis and sarcopenia. The outcomes showed that raised oxytocin levels were related to a decreased risk of osteoporosis, and raised DHEA levels were related to a reduced risk of sarcopenia. In any case, raised follistatin levels were related to an increased risk of sarcopenia.

The connections between serum myokines, sex hormones, bone turnover markers, bone mass, muscle mass, and muscle strength all together in a similar study population. We observed that postmenopausal women with sarcopenia were bound to have lower DHEA levels and higher follistatin levels, and postmenopausal women with osteoporosis were bound to have lower oxytocin levels. Outstandingly, the connections between serum follistatin and DHEA and sarcopenia and the relationship between serum oxytocin and osteoporosis were free of activity and vitamin D levels. Hence, serum oxytocin, DHEA and follistatin are promising competitors as serum biomarkers connected with osteoporosis as well as sarcopenia, regardless of exercise and vitamin D status.

Correspondence to: Kai Zhu, Department of Orthopedics, Shanghai Jiaotong University School of Medicine, Shanghai, China, E-mail: kai.zhu@hust.edu.cn

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