

OSTEOPOROSIS AND SARCOPENIA: SIMILARITIES AND DIFFERENCES

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Introduction: Loss of bone and muscle with advancing age represents a huge threat to loss of independence in later life. Osteoporosis is defined as a systemic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue with a consequent increase in bone fragility and susceptibility to fracture. Osteoporotic fractures, a major cause of morbidity in the population, are associated with increased mortality and generate direct costs in excess of 35 billion euros, in 2010, in the 27 EU countries. **Purpose:** Sarcopenia corresponds to a progressive and generalized loss of muscle mass with either a loss of muscle strength or a loss of physical performance. However, a single consensual operational definition of sarcopenia is lacking and none of the definitions, proposed so far, unequivocally emerge as providing benefits over previous ones, leading to inconsistent reports across cohorts on its prevalence. **Discussion:** Nevertheless, there is a wide consensus to consider that consequences of sarcopenia, including physical disability, nursing home admissions, depression, hospitalizations and mortality are linked to direct healthcare costs estimated in 2000, in the USA, to raise up to 18.5 billion USD. During the last decade, bone and muscle were increasingly recognized as interacting tissues, not only because of their adjacent surfaces or as a result of the mechanical effects of muscle loading on bone function. In this perspective, the 'bone-muscle' unit would be the site of privileged exchanges in which the two tissues communicate via paracrine and endocrine signals to coordinate their development and adapt their response to loading and injury from embryologic stages to involution. Growing evidence shows that sarcopenia and osteoporosis share many common pathways including the sensitivity to reduced anabolic hormone secretion, increased inflammatory cytokine activity, anabolic or catabolic molecules released by the skeletal muscle or by the bone cells (i.e. myokines and osteokines) and eventually, reduced physical activity. With adipose tissue and cartilage being also involved in their complex interactions came the suggestion that obesity, sarcopenia and osteoporosis could be concomitantly found in a subset of the population, presenting with an entity called osteosarcopenic obesity (OSO) with health outcomes likely to be worse compared with individuals with only one of these disorders. **Conclusion:** This lecture will review recent publications which help to better understand the complex relationship between osteoporosis and sarcopenia, hopefully paving the way for the development of chemical entities that are able to target both diseases.