

Osteosarcopenia - Current Concepts

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Abstract

Osteosarcoma is a combination of osteoporosis and sarcopenia, that is, it is a combination of weak bones and muscles. No specific definition for Osteosarcopenia. There are different parameters which are used to assess. These are associated with age and generally progress together. Hence, intervention planned should also be done together. Osteosarcopenia sets in and that may lead to increased risks of falls and the increase in the number of fractures. However, larger studies are required for the accurate measurement and the medical management of Osteosarcopenia.

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Introduction

Osteosarcopenia is derived from a combination of osteoporosis and sarcopenia [1]. Sarcopenia is a term used for low muscles mass whereas osteoporosis is a term for low bone mass [2-4]. With the latest understanding of the relation between the muscle and bone mass the importance of Osteosarcopenia is coming up [5]. Osteoporosis has a clear definition as being t score of BMD less than -2.5 or presence of a fragility fracture [6]. However, there is no specific definition for sarcopenia [7]. Different parameters have been used in some studies for defining sarcopenia. These include grip strength, muscle mass and overall performance of the patients including walking speeds and so on. Quantitative measurement of the muscle mass includes the use of Dual energy X-ray absorptiometry (DXA) or bioimpedance analysis (BIA) [7, 8]. The revised European working Group on Sarcopenia in Older people (EWGSOP2) has also included the use of CT scan and MRI for the assessment of the muscle mass [9]. The clinical use of CT and MRI however, is not viable [10]. According to recent clinical practice guidelines sarcopenia is age associated skeletal muscle mass and function loss [9].

Both osteoporosis and sarcopenia share a common mechanism of progress [5]. Hence, they should be considered together. This decrease in the bone and muscle mass can be linked to the interplay of genetic, nutritional, hormonal and lifestyle factors however, the significance of this correlation is still in its infancy. If we are able to identify these then we can identify areas of intervention which can lead to better muscle and bone health [5]. These interventions include specific exercises, nutritional support, calcium and vitamin D supplementations and specific treatment of osteoporosis [11, 12].

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Recent Advances

Recently research regarding Osteosarcopenia and its impact on the negative outcomes of falls and fracture healing include the direct measure of muscle mass, the D3 creatine dilution method [8, 13]. This test is showing a strong correlation not only in the fracture healing but also in the overall falls and mortality as well [14]. This when compared with the DXA and lean muscle mass the DXA studies show a mixed association [15] hence, the D3 creatine test provides a better picture of the Osteosarcopenia than the DXA. The concept of Rosenberg [16] regarding Sarcopenia “no decline with age is more dramatic or potentially more functionally significant than the decline in lean body mass” 30 years ago should be reviewed in the present light. So the more important criteria of sarcopenia would be the measurement of the lean body mass by the D3 creatine dilution method [17].

The impact of Osteosarcopenia on generalised healing and health of the patients has led to the active research in the various pharmaceutical agents which can lead to the reversing of this phenomenon. These include myostatin, androgens, fatty acid synthesis and receptor activator of nuclear κ B (RANK) pathways.

Myostatin - lead to the up regulation of bone and muscle mass. However, myostatin receptors are also present in the cardiac tissues so there are safety issues regarding its use [18]. Selective Androgen Receptor Modulators (SARMs) causes increase in the muscle mass and strength in post-menopausal and hypogonadal females [19]. However, study done did not show any increase in muscle strength in females over 65 years [20]. Denosumab (RANK ligand inhibitor) was compared with bisphosphonates for osteoporosis. Denosumab not only increased the bone mass but also increased the muscle mass and function [21]. This is a significant finding and can really help in the management of Osteosarcopenia.

Osteosarcopenia is a new term and the implications and uses are still being researched. As the age progresses Osteosarcopenia sets in and that may lead to increased risks of falls and the increase in the number of fractures. This may also lead to decreased fracture healing in elderly patients and hence, should be kept in mind while managing such patients. Accurate measurement of muscle mass and the incorporation of Osteosarcopenia in our daily practice will lead to either acceptance or rejection of this concept. In the current scenario this provides a possible breakthrough which may later modify the management of fracture in the geriatric population.

References

1. Huo YR., *et al.* “Phenotype of osteosarcopenia in older individuals with a history of falling”. *Journal of the American Medical Directors Association* 16.4 (2015): 290-295.
2. Yoo JI., *et al.* “High Prevalence of Sarcopenia in Korean Patients after Hip Fracture: a Case-Control Study”. *Journal of Korean Medical Science* 31.9 (2016): 1479-1484.
3. Scott D., *et al.* “Does Combined Osteopenia/Osteoporosis and Sarcopenia Confer Greater Risk of Falls and Fracture Than Either Condition Alone in Older Men? The Concord Health and Ageing in Men Project”. *The journals of gerontology. Series A, Biological sciences and medical sciences* 74.6 (2019): 827-834.
4. Bauer JM., *et al.* “Is There Enough Evidence for Osteosarcopenic Obesity as a Distinct Entity? A Critical Literature Review”. *Calcified Tissue International* 105.2 (2019): 125-126.
5. Hirschfeld HP., *et al.* “Osteosarcopenia: where bone, muscle, and fat collide”. *Osteoporosis International* 28.10 (2017): 2781-2790.
6. World Health Organization. “Assessment of fracture risk and its application to screening for postmenopausal osteoporosis”. *Geneva: World Health Organization* (1994).
7. Cawthon PM. “Recent Progress in Sarcopenia Research: a Focus on Operationalizing a Definition of Sarcopenia”. *Current Osteoporosis Reports* 16.6 (2018): 730-737.
8. EvansWJ., *et al.* “D 3 -Creatine dilution and the importance of accuracy in the assessment of skeletal muscle mass”. *Journal of Cachexia, Sarcopenia and Muscle* 10.1 (2019): 14-21.
9. Cruz-Jentoft AJ., *et al.* “Sarcopenia: revised European consensus on definition and diagnosis”. *Age and Ageing* 48.1 (2019): 16-31.
10. Lee K., *et al.* “Recent Issues on Body Composition Imaging for Sarcopenia Evaluation”. *Korean Journal of Radiology* 20.2 (2019): 205-217.

11. Dent E., *et al.* "International Clinical Practice Guidelines for Sarcopenia (ICFSR): Screening, Diagnosis and Management". *Journal of Nutrition Health & Aging* 22.10 (2018): 1148-1161.
12. Zanker J and Duque G. "Osteoporosis in Older Persons: Old and New Players". *Journal of the American Geriatrics Society* 67.4 (2019): 831-840.
13. Clark RV., *et al.* "Total body skeletal muscle mass: estimation by creatine (methyl-d3) dilution in humans". *Journal of Applied Physiology* 116.12 (2014): 1605-1613.
14. Cawthon PM., *et al.* "Strong Relation Between Muscle Mass Determined by D3-creatine Dilution, Physical Performance, and Incidence of Falls and Mobility Limitations in a Prospective Cohort of Older Men". *The journals of gerontology. Series A, Biological sciences and medical sciences* 74.6 (2019): 844-852.
15. Schaap LA., *et al.* "Adiposity, muscle mass, and muscle strength in relation to functional decline in older persons". *Epidemiologic Reviews* 35 (2013): 51-65.
16. Rosenberg IH. "Summary comments: Epidemiologic and methodologic problems in determining nutritional status of older persons". *The American Journal of Clinical Nutrition* 50.5 (1989): 1231-1235.
17. Zanker J and Duque G. "Osteosarcopenia: the Path Beyond Controversy". *Current Osteoporosis Reports* 18.2 (2020): 81-84.
18. Becker C., *et al.* "Myostatin antibody (LY2495655) in older weak fallers: a proof-of-concept, randomised, phase 2 trial". *The Lancet Diabetes & Endocrinology* 3.12 (2015): 948-957.
19. Dobs AS., *et al.* "Differential effects of oral estrogen versus oral estrogen-androgen replacement therapy on body composition in postmenopausal women". *The Journal of Clinical Endocrinology and Metabolism* 87.4 (2002):1509-1516.
20. Papanicolaou DA., *et al.* "A phase IIA randomized, placebo-controlled clinical trial to study the efficacy and safety of the selective androgen receptor modulator (SARM), MK-0773 in female participants with sarcopenia". *The Journal of Nutrition, Health and Aging* 17.6 (2013): 533-543.
21. Bonnet N., *et al.* "RANKL inhibition improves muscle strength and insulin sensitivity and restores bone mass". *Journal of Clinical Investigation* 129.8 (2019): 3214-3223.

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