

## Is there a causal relationship between sarcopenia and dynapenia in patients undergoing bariatric surgery?

### Existe relação de causalidade entre sarcopenia e dinapenia em pacientes submetidos à cirurgia bariátrica?

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Sarcopenia is defined, in the Greek language, as “poverty of the flesh” and, at first, it was treated as the natural process of aging related to the decline of the lean mass [1]. This concept, however, is still not established. Some authors limit sarcopenia only to the loss of lean mass, others also associate it with loss of muscle strength - called dynapenia - unifying the two concepts [2]. Furthermore, sarcopenia is not only linked to the aging process, as it involves a multifactorial system such as obesity, for example.

Obesity is a global epidemic condition of significant social and economic impact that can lead to chronic diseases, functional limitations, high risk of mortality, and, when associated with the diagnosis of sarcopenia, is called sarcopenic obesity [3]. Obese patients have a greater amount of muscle mass and strength compared to non-obese individuals and morphological changes such as weight loss generally have repercussions on the decrease in lean mass, causing sarcopenia (SO) [3].

The European Working Group on Sarcopenia in Older People (EWGSOP) is responsible for the currently most used guideline for the diagnosis and grading of sarcopenia [1]. The muscular strength with the handgrip test, the volume of lean mass with the study of bioimpedance, and the gait speed in the walking test, also applied in the Short Physical Performance Battery (SPPB), are the evaluated parameters, being possible to grade the sarcopenia in pre-sarcopenia, sarcopenia and severe sarcopenia [1,2]. The guideline EWGSOP2, an updated version of EWGSOP, uses the sit-to-stand test (SST) as a muscle strength parameter, evaluating the speed of the individual in getting up from a chair [3].

In a recent study, women undergoing bariatric surgery in a period of weight stability, when compared with women with SO who did not undergo the same surgery, performed better on the SST and SPPB [3]. In another study, it was estimated that the prevalence of SO in the elderly ( $\geq 60$  years) in the world was 15% when the diagnosis of sarcopenia was based only on the volume of lean mass and decreased to 4% when muscle strength and physical functionality were considered [4]. These results refer to the possibility of the current guidelines are neglecting the influence of body fat index, in addition to raising the

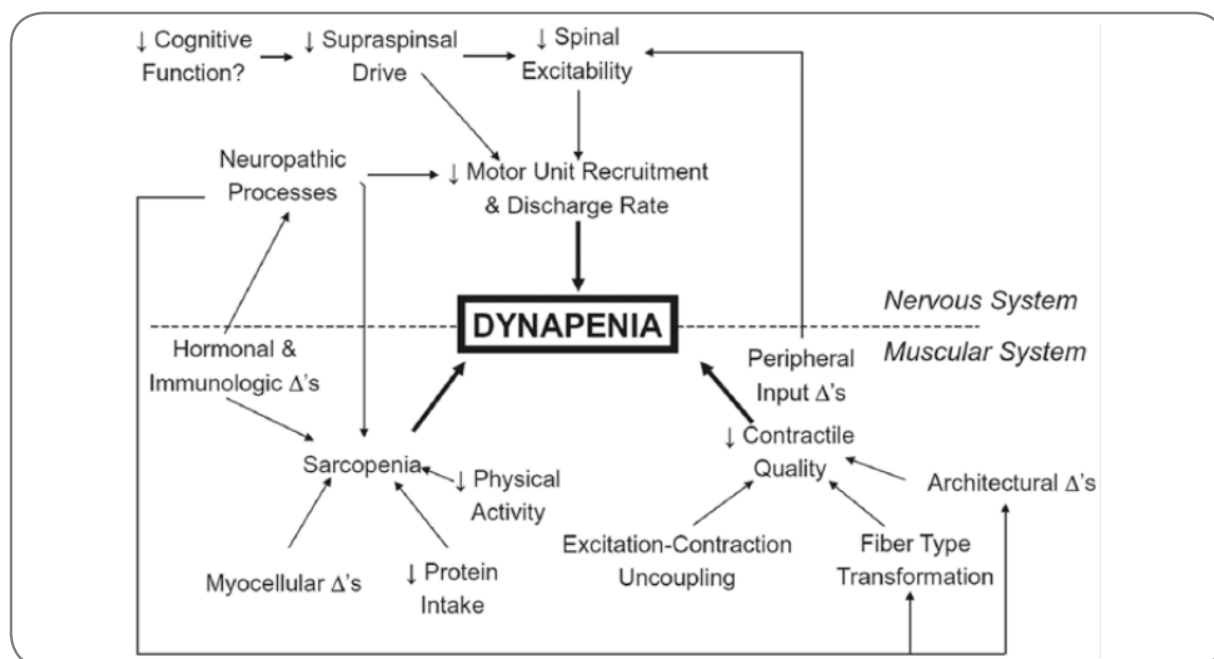
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hypothesis that there is no causal relationship between sarcopenia and dynapenia.

The Figure 1 presents a working model for one of the current perceptions about the etiological multifactorial system of dynapenia in the elderly. The hypothesis to be tested is the inexistence of a causal relationship between sarcopenia and dynapenia and to investigate other factors capable of influencing more significantly, such as body fat index, the outcome of dynapenia in obese individuals.

The understanding of the multifactorial system that involves the development of sarcopenia and dynapenia, the elucidation of their concepts, and the understanding of the nature of the causal relationship between the two conditions can work in the prevention of motor dysfunction in obese and elderly individuals and improve the quality of life for this population.



**Figure 1** – Working model created by Clark & Manini [5] to explore the multifactorial biological mechanisms that may influence the loss of muscle strength in the elderly

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