

## Body Composition and Frailty: The Role of Adiposity

E. Ferrioli<sup>1,2</sup>, H. Roschel<sup>3,4</sup>

1. Laboratório de Investigação Médica em Envelhecimento (LIM-66), Serviço de Geriatria, Hospital das Clínicas HCFMUSP, Faculdade de Medicina, Universidade de São Paulo (USP), São Paulo, SP, Brasil; 2. Faculdade de Medicina da Universidade de São Paulo, Disciplina de Geriatria, Universidade de São Paulo, São Paulo, SP, Brasil; 3. Applied Physiology & Nutrition Research Group, University of Sao Paulo, Sao Paulo, Brazil; 4. Faculdade de Medicina FMUSP, Divisão de Reumatologia, Universidade de São Paulo, São Paulo, SP, Brasil

Corresponding Author: Eduardo Ferrioli, Laboratório de Investigação Médica em Envelhecimento (LIM-66), Serviço de Geriatria, Hospital das Clínicas HCFMUSP, Faculdade de Medicina, Universidade de São Paulo (USP), São Paulo, SP, Brasil, [eferriol@fmrp.usp.br](mailto:eferriol@fmrp.usp.br)

Frailty is an age-related syndrome characterized by reduced functional reserve and multisystemic impairments, resulting in increased vulnerability and morbimortality (1). Despite limited and heterogeneous data, prevalence of frailty is considered a health issue worldwide (2), with critical impact on health and social care services as a function of increased loss of independence (1, 3), deeming the identification and understanding of its underlying factors crucial for early intervention.

Although the etiology of frailty is considered multifactorial, changes in body composition seem to be at the heart of the frailty phenotype (3). Indeed, sarcopenia (i.e., loss of muscle mass, quality, and function) is highly prevalent among individuals with frailty, ranging between 40-72% depending on classification criteria (4). The link between age-related in adiposity and frailty is, however, controversial as some studies have found obesity to be associated with a higher risk for frailty (5-7) whereas others have found lower BMI to be associated with increased frailty risk (5, 7). Importantly, BMI is an indirect, and very limited, surrogate for adiposity. Therefore, further insights from studies quantifying compartmental adiposity through imaging techniques are certainly welcome in order to gather knowledge on the possible association between frailty and body fat mass, especially if considering the different metabolic roles of subcutaneous and visceral adipose tissues (8).

In this edition of The Journal of Nutrition, Health & Aging, an interesting article addressed this issue. Uchai et al. (9) report results from an 8-year prospective observational study investigating on the associations between total and visceral adiposity with pre-frailty/frailty in a cohort of 380 Norwegian adults. Interestingly, despite similar prevalence in pre-frailty/frailty between women and men, authors found a sex-based difference in the associations between DXA-derived adiposity measures and odds of pre-frailty/frailty, with fat mass index ( $\text{kg}\cdot\text{m}^{-2}$ ) and visceral adipose tissue at baseline serving as good predictors for pre-frail/frail classification after 8 years of follow up in women, but not in men. In numbers, data showed that every  $1\text{-kg}\cdot\text{m}^{-2}$  increase in baseline FMI and every 100-g increase in baseline visceral adiposity significantly increased odds of frailty by 18 and 7%, respectively, among women. These are relevant findings that adds to the existing literature, bringing about the need of identification of early markers of frailty risk.

The study, however, is not without limitations. The authors were not able to take into account other objectively measured aspects known to influence changes in body composition and frailty, such as physical activity levels and nutrition. Moreover, the study design did not allow capturing fluctuations in the parameters assessed, as well as other clinical events, such as hospitalizations, that may influence results. It is also important to notice that their sample is not free of selection bias, as participants lost to follow up were generally older and with a higher adiposity (and other risk factors) than those incorporated into the analyses, which were mostly composed of pre-frail, rather than frail subjects. The latter poses an important issue, as prefrailty defines a quite heterogeneous population in terms of function and future risks (10). Also, self-reported frailty indicators may result in misclassification and, thus, interpretation of the findings, especially when considering the low number of male participants presenting with frailty indicators.

When put into perspective, data from Uchai et al. also prompts an important question on the rising proportion of the coexistence of obesity and sarcopenia among older individuals (11-13), which poses a greater risk of both frailty and morbimorbidity (12, 14). Along with further studies on the identification of early markers of frailty and more in-depth investigations on the effects of possible sex-based difference in that, we believe that further studies on the interplay between obesity and sarcopenia (and frailty) are warranted.

*Conflict of interest:* There is no conflict of interest declared.

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