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Evaluation of Sarcopenia in Long-lived Elderly Patients: Comparison Between the Muscle Mass Index and the Calf Circumference

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Introduction: With population aging, many elderly citizens have been achieving extreme longevity ($\geq$ 90 years). Sarcopenia is related to several adverse outcomes, such as disability, falls, hospitalization and death; hence, its early identification is important. Several methods can be used for its evaluation, with dual-energy x-ray absorptiometry (DXA) being the most accurate. Nevertheless, due to low availability and high cost, other methods are routinely adopted for screening in Primary Health Care (PHC), such as the evaluation of the Muscle Mass Index (MMI) and the Calf Circumference (CC).

Objective: To evaluate sarcopenia in elderly people with extreme longevity, and then compare it by means of MMI and CC.

Methodology: Cross-sectional and quantitative study, performed in 2019/2020, with n = 69 individuals aged $\geq$ 90 years, of both genders, users of the Unified Health System in the town of *Três Lagoas – MS*. We collected sociodemographic and anthropometric data in triplicate. For CC, we used a cutoff score $\leq$ 31 centimeters as a sign of sarcopenia. We determined MMI based on the calculation of skeletal muscle mass, using the formula of Lee and collaborators, which considers height, body mass, gender, age and ethnicity. The classification of sarcopenia adopted was that of Janssen and collaborators (women: $\leq$ 5.75 kg/m2 = severe sarcopenia; 5.76 – 6.75 kg/m2 = moderate sarcopenia; and $\geq$ 6.76 kg/m2 = normal muscle mass. Men: $\leq$ 8.50 kg/m2 = severe sarcopenia; 8.51 – 10.75 kg/m2 = moderate sarcopenia; and $\geq$ 10.76 kg/ m2 = normal muscle mass). In order to relate the variables, we applied the Spearman's correlation test.

Results: A total of 52.2% of the participants were women, with an average age of 93.5 years old and 1.3 years of schooling. The average CC was 31.2 centimeters, with 46.1% being considered sarcopenic patients according to this parameter. The average MMI was 5.1 kg/m2, with 100% of the elderly patients being considered sarcopenic through this method. There was no relationship between CC and MMI (p = 0.213).

Discussion: We found a high prevalence of sarcopenia in the long-lived elderly patients, mainly using MMI. This data is worrying, since these elderly people may have several limitations due to sarcopenia. The absence of a relationship between the CC and MMI variables highlights the need to use more reliable methods to evaluate sarcopenia in long-lived elderly people, since the identification from CC, despite being easy and fast, may not be sensitive in this age group.

Conclusion: We should highlight the need for personalization of public policies and evaluation recommendations for elderly people with extreme longevity in PHC, as they constitute a group that has unique characteristics.

Keywords: Aged; Longevity; Sarcopenia.