Association Between Malnutrition and Sarcopenia During Hospitalisation in Older People: A Challenge in Rehabilitation

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Abstract from Pourhassan M, Rommersbach N, Lueg G, et al.: The Impact of Malnutrition on Acute Muscle Wasting in Frail Older Hospitalized Patients. *Nutrients* 2020;12(5):1387.

Keywords

Muscle mass · Muscle strength · Malnutrition · GLIM criteria · Geriatric hospitalized patients

Abstract

Very little is known about the effect of malnutrition on short-term changes of body composition, particularly muscle, among older hospitalized patients. We sought to investigate the association of malnutrition as assessed by the Global Leadership Initiative on Malnutrition (GLIM) criteria with changes of thigh muscle mass and muscle strength among older patients during hospitalization. Forty-one patients (age range 66–97 years, 73% female) participated in this prospective longitudinal observational study. Nutritional status was evaluated using the GLIM criteria on admission and at discharge. Functional status and mid-thigh magnetic resonance imaging (MRI) measurements of cross-sectional area (CSA) were conducted on admission and before discharge. In all, 17%

were malnourished and 83% had no malnutrition. Mean mid-thigh muscle CSA declined by 7.0 cm² (–9%) in malnourished patients during hospitalization ($p = 0.008$) and remained unchanged among non-malnourished patients (–1%, $p = 0.390$). Mean mid-thigh CSA of subcutaneous and intermuscular fat did not change significantly during hospitalization in both groups. Malnourished subjects lost 10% of handgrip strength (–1.8 kg) and 12% of knee extension strength (–1.5 kg) during hospitalization. However, the magnitude of both changes did not differ between groups. In a stepwise multiple regression analysis, malnutrition and changes in body weight during hospitalization were the major independent risk factors for the reduction of muscle CSA. Malnutrition according to the GLIM criteria was significantly and independently associated with acute muscle wasting in frail older patients during 2-week hospitalization.

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Knowledge Transfer

Study Results

This prospective longitudinal observational study by Pourhassan et al. proves that malnutrition, diagnosed according to Global Leadership Initiative on Malnutrition (GLIM) criteria, is a major risk factor for reduced muscle mass in frail older patients during hospitalisation [1]. When malnutrition is combined with physical inactivity, which is prevalent in older people due to bed rest, muscle mass and strength decline. The aim of the study was to examine changes in muscle mass and strength between malnourished and adequately nourished frail older adults during hospitalisation (41 patients, aged 66–97 years). The nutritional status of the patients was examined with the Mini Nutritional Assessment Short-Form (MNA-SF) and GLIM criteria; the patients were then divided into two groups (malnourished and non-malnourished). The Barthel Index was used for geriatric assessment, the SARC-F questionnaire to determine the risk of sarcopenia, the FRAIL scale to assess the risk of frailty, and the Charlson Comorbidity Index to identify medical comorbidities. Additionally, patients underwent an assessment of handgrip strength and isometric knee extension strength. Finally, MRI scans were used to assess mid-thigh muscle, subcutaneous fat, and intermuscular fat cross-sectional area (CSA). All data were collected upon admission to hospital and before discharge (length of hospitalisation ≥ 14 days) [1].

Out of 41 patients, 17% were malnourished and 83% were non-malnourished. The results showed a decrease in mean mid-thigh muscle CSA (9% (7 cm²) according to GLIM criteria, 8% (6 cm²) according to MNA-SF) in malnourished patients between the time of admission and discharge, in comparison to non-malnourished patients. Furthermore, malnourished patients showed a decrease of 10% in handgrip and 12% in knee extension strength. The remarkable finding of this study was that malnutrition according to GLIM criteria constituted the most important risk factor for mid-thigh muscle mass loss during hospitalisation. Body weight changes during hospitalisation were the second most important factor [1].

Conclusion for Clinical Practice

A meta-analysis from 2020 showed that the prevalence of sarcopenia was highest among individuals in nursing homes, followed by older adults staying in hospitals, and lowest in community-dwelling elderly people [2]. Senior citizens in Northern Greece were found to have low energy intakes; an energy intake of more than 25–30 kcal/kg of body weight is needed in order to prevent sarcopenia [3]. Furthermore, it should be taken into consideration that people staying at nursing homes or hospitals have limited choices regarding meals and physical activity while they are on bed rest for several hours. This combination constitutes a crucial risk factor for sarcopenia [2]. An appropriate physical activity program with a balanced diet sufficient in energy and adequate in protein [4] (which is associated with muscle mass and strength maintenance [5]) and other macro- and micronutrients is of great significance in the prevention of sarcopenia [4].

Disclosure Statement

I hereby declare that there are no conflicts of interests regarding this commentary.

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