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Original Study

Identifying Sarcopenia in Acute Care Setting Patients

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A B S T R A C T

Objectives: To evaluate the prevalence of sarcopenia by applying European Working Group on Sarcopenia in Older People (EWGSOP) flow chart in an acute care geriatric unit as well as to test a modified version of the EWGSOP diagnostic algorithm combining handgrip and gait speed test to identify subjects with low muscle mass.
Design: Observational cohort study.
Setting: Geriatric unit in an academic medical department.
Participants: One hundred nineteen acutely ill persons (34.4% female), with mean age 80.4 ± 6.9 years and body mass index 26.3 ± 4.9 kg/m^2.
Measurements: Assessment of muscle mass by bioimpedence analysis, muscle strength by handheld dynamometer, and gait speed with the 4-meter walking test.
Results: Using the EWGSOP classification for sarcopenia, 5.0% presented with sarcopenia and 21.0% with severe sarcopenia. Combining gait speed test and handgrip strength measurement, the highest predictive power in detecting subjects with low muscle mass was observed (sensitivity and specificity, 80.6% and 62.5%, respectively). Subjects presenting with both normal gait speed and handgrip showed normal values of muscle mass as assessed with bioimpedence analysis. By using the ROC method, when the 2 tests were combined, the AUC was statistically higher than when using each test separately (0.740; $P = .018$).
Conclusions: Our study shows that 1 of 4 patients admitted to the acute care department were recognized to be sarcopenic. When a modifived version of the EWGSOP flow chart, obtained combining both gait speed and handgrip was used, sensitivity and specificity of algorithm to identify subjects with low muscle mass was improved.

Sarcopenia, the age-associated loss of skeletal muscle mass and function, is a common condition and has important consequences in terms of disability and financial costs.[1]

However, sarcopenia still has no broadly accepted clinical definition, clear diagnostic criteria, and International Classification of Disease 9th Revision codes. To address this shortcoming, in 2010 the European Working Group on Sarcopenia in Older People (EWGSOP) proposed a practical definition and diagnostic criteria for sarcopenia[2] that include both low muscle mass and low muscle function (strength or performance), taking into account that muscle function anticipates the loss of muscle mass[3] and has major health consequences.

Moreover EWGSOP developed an algorithm for sarcopenia based on easily available measurements such as gait speed, grip strength, and muscle mass as assessed with bioimpedence analysis (BIA) or dual X-ray absorptiometry (DXA).

In a recent study Landi et al[4] tested the EWGSOP algorithm in 122 elderly subjects living in a nursing home, but there is a lack of studies investigating the prevalence of sarcopenia in an acute care geriatric hospital setting. Therefore, the purpose of this study was to evaluate the prevalence of sarcopenia by applying the EWGSOP flow chart in

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The authors declare no conflicts of interest.

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this population. A further aim was to test a modified version of the EWGSOP diagnostic algorithm considering handgrip and gait speed test for all participants.

Methods

Selection of the Sample

Participants were all Caucasian and were consecutively recruited from inpatients admitted between December 2010 and April 2011 in the acute care Division of Geriatric Medicine University of Verona. Patients were eligible for inclusion if they (1) were aged 65 years or older; (2) were admitted on a weekday and consented to participate in the study within 24 hours of admission; and (3) were deemed cognitively appropriate to provide informed consent. The flow chart of study participants is shown in Figure 1. Of the 254 persons, 38 were not included because they refused to participate in the study, and 58 persons were excluded because they were previously bedridden (n = 18) or bedridden for terminal diseases (n = 16), or had peripheral vascular disease with intermittent claudication (n = 2), acute arthritis (n = 1), chronic obstructive pulmonary disease with forced expiratory volume in 1 second <50% predicted (Global Initiative for Chronic Obstructive Lung Disease American Thoracic Society/European Respiratory Society stage III and IV) (n = 3), New York Heart Association stage IV heart failure (n = 4), cachexia as defined by the Society on Sarcopenia, Cachexia, and Wasting Disorders (n = 12)[5] or contraindication to perform BIA (such as presence of implantable cardiac defibrillator) (n = 2). None presented specific muscle disease.

Of the remaining 158 participants, in 39 participants with a mean age 81.7 ± 7.0 years and mean body mass index (BMI) 25.6 ± 4.9 kg/m^2, it was not possible to perform gait speed because they were unable to rise from a chair for acute medical illness (mainly for cerebrovascular disease, major fractures, or consequences of falls). In a total of 119 participants (78 men and 41 women) with mean age 80.4 ± 6.9 years and mean BMI 26.3 ± 4.9 kg/m^2, it was possible to measure both gait speed and handgrip and, therefore, were included in the study.

All participants underwent clinical evaluation, with a structured collection of medical history with particular attention to the reason for admission. In addition, the possible causes of intercurrent bed ridding of the patient (eg, onset of diarrhoea, falls, delirium, nosocomial infections, adverse drug reactions, etc) were evaluated. We found that 29.4% of patients were hospitalized for heart failure, 13.5% for syncope, 10.1% for new-onset atrial fibrillation, 10.1% for acute anemia, 9.2% for angina or acute coronary syndrome, 5.9% for pneumonia, 4.2% for urinary tract infection, 3.7 for minor orthopedic problems, 3.4% for chronic obstructive pulmonary disease exacerbations, 3.4% for minor hepatic pathology, 2.5% for pulmonary embolism, and 4.6% for other causes.

Body Composition

With the participants wearing light indoor clothes and no shoes, body weight and height were measured to the nearest 0.1 kg and 0.1 cm using standardized equipment (Salus scale and stadiometer; Salus Milan, Italy) and procedures. BMI was calculated as weight/height squared (kg/m^2).

Skeletal muscle mass measurements

BIA resistance (ohms) was used to evaluate muscle mass. BIA resistance was obtained using Akern STA model (Akern srl, Florence, Italy) with an operating frequency of 50 kHz at 800 μA. Whole body BIA measurements were taken between the right wrist and ankle with the subject in a supine position in a nonconducting surface, with the arms slightly abducted from the trunk and the legs slightly separated. Muscle mass was calculated using the BIA equation of Janssen et al[6]: skeletal muscle mass (kg) = [(height^2/BIA-resistance × 0.401) + (sex × 3.825) + (age × − 0.071)] + 5.102 where height is in cm; BIA-resistance is in ohm; for sex, men = 1 and women = 0; and

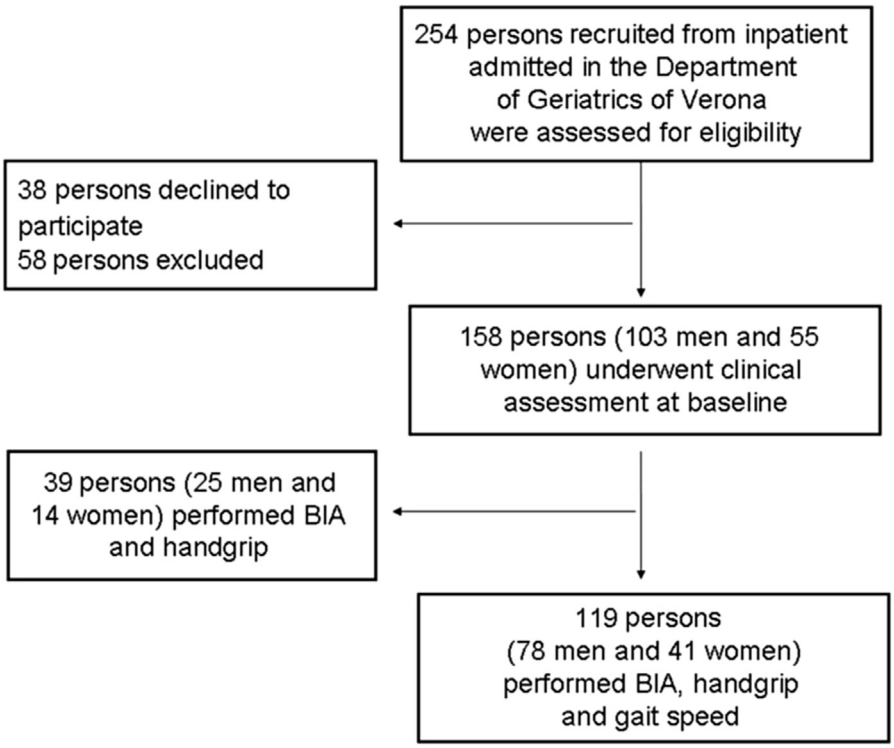

Fig. 1. Flow chart of participant recruitment, screening, and assessment. BIA, bioimpedence analysis.