Sarcopenia
A Rheumatic Disease?

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KEYWORDS

- Sarcopenia • Muscle strength • Muscle atrophy • Frailty • Aging • Senescence
- Fall risk • Skeletal muscle mass loss

KEY POINTS

- Sarcopenia involves the loss of muscle mass, muscle strength, and physical function with aging.
- It is a prevalent but underrecognized problem in the elderly population, causing limitation of activities of daily living and increasing the risk of fall and mortality.
- To date, a common clinical definition and diagnostic criteria for sarcopenia are lacking. Many commonly used screening tools use parameters to assess for muscle mass, strength, and function to define sarcopenia.
- The goal of this article is to promote awareness among physicians of early recognition and management of sarcopenia.

INTRODUCTION

The term Sarcopenia (Greek, *sarx* for "flesh" and *penia* for "loss") refers to the phenomenon of reduction of muscular mass, strength, and function with aging.[1] Muscle strength is a critical component of walking, and its decrease in the elderly contributes to a high prevalence of falls. Sarcopenia is significantly associated with self-reported physical disability in both men and women, independent of ethnicity, age, morbidity, obesity, income, or health behaviors.[2] Reduced muscle strength with aging leads to loss of functional capacity and is a major cause of disability, mortality, and other adverse health outcomes.[3]

As the number and proportion of elderly in the population continue to increase, sarcopenia-related morbidity will become an increasing area of health care resource utilization. Increased awareness of the condition among clinicians and researchers, especially rheumatologists, is paramount to recognize and manage this condition because early recognition and intervention can mitigate its deleterious outcomes. This review highlights the major aspects of sarcopenia, including definition, prevalence, pathophysiology, diagnosis, and management. The authors also discuss the causes and impact of secondary sarcopenia.

DEFINITION

Development of a universally applicable and acceptable definition of sarcopenia has been a major limitation in the advancement of the field. Since Rosenberg first coined the term sarcopenia in 1988,[1] multiple definitions of sarcopenia have been proposed, but to date there is no unanimously accepted method to define and diagnose sarcopenia. In 1998, Baumgartner and colleagues[2] proposed using lean skeletal muscle mass index (SMI) defined as appendicular (4 limbs) skeletal muscle mass as determined by dual X-ray absorptiometry (DEXA) divided by height (kg/m^2) and compared with a normal reference population as a standard measure for sarcopenia. This methodology showed promise. It is predictive for negative outcomes, and the same DEXA scan used in osteoporosis screening may be used to estimate the degree of sarcopenia, all with no added cost or radiation exposure to the patient.[2] However, muscle quantity or mass does not reflect quality and function of muscle.[4]

To account for these limitations, newer definitions of sarcopenia from the European Society on Clinician Nutrition and Metabolism special interest groups,[5] International Working Group on Sarcopenia (IWGS),[6] European Working Group on Sarcopenia in Older People (EWGSOP),[7] and the Foundation of the National Institute of Health (FNIH)[8] have proposed slightly differing definitions of sarcopenia that include muscle mass and function (Table 1). In addition, the EWGSOP suggested staging of sarcopenia into 3 different categories based on the presence of low muscle mass and the presence or absence of functional impairment[7] (Table 2). These progressive stages of sarcopenia have a dose-response relationship with functional limitations.

EPIDEMIOLOGY

There is a significant variability in the reported prevalence of sarcopenia due to differing definitions, tools of diagnosis, and patient populations. A recent study of community-dwelling older adults (average age of 67 years) in the United Kingdom found the prevalence of sarcopenia to be 4.6% in men and 7.9% in women using the EWGSOP criteria.[9] A study from the United States, conducted among adults with an average age of 70.1 years, reported the prevalence of sarcopenia to be as high as 36.5%.[10] In a Japanese population of community-dwelling elderly adults, the prevalence of sarcopenia ranged from 2.5% to 28.0% in men and 2.3% to 11.7% in women.[11]

Much of the difference in these estimates may be due to the lack of uniform criteria to diagnose sarcopenia. In fact, when assessing prevalence of sarcopenia in the same cohort using different definitions, it appears the FNIH criteria give a more conservative estimate (men = 1.3%, women = 2.3%), compared with IWGS (men = 5.1%, women = 11.8%) or EWGSOP criteria (men = 5.3%, women = 13.3%).[12] Interestingly, the criteria agreed in exclusion of sarcopenia but not for establishing a diagnosis. This differences underscores the critical need for a uniform, universally applicable operating definition of sarcopenia.