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EDITORIAL

Myopenia—a new universal term for muscle wasting

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Abstract A universal term describing the presence of clinically relevant muscle wasting that warrants medical intervention is required. The term sarcopenia might be used in this context. However, common use now means that sarcopenia is more often regarded as synonymous with age-associated muscle wasting in the elderly. We suggest the term "myopenia" to indicate the presence of clinically relevant muscle wasting due to any illness and at any age. This term would translate well into any language and is sufficiently specific if appropriately defined. We suggest to define myopenia as a clinically relevant degree of muscle wasting that is associated either with impaired functional capacity and/or with increased risk of morbidity or mortality. The precise cut-points to define myopenia may be different in various diseases. Myopenia could be diagnosed when a certain degree of muscle wasting over time has occurred (for instance, at least 5% in 6–12 months) or when muscle mass is below a certain threshold level (for instance, the <5th centile of healthy 30-year-olds or a fat-free mass index <16 kg/m^2 for men and <15 kg/m^2 for women). Future studies need to refine these in a disease-specific manner and link them to degrees of functional impairment that are clinically relevant and/or to degrees of risk of morbid or fatal events.

Keywords Muscle wasting · Myopenia · Cachexia · Sarcopenia · Definition · Therapy

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It is difficult to treat a disease one cannot define. And certainly, it is impossible to get an approvable indication for a new medication for a disease one cannot define. A clear definition and classification system is thus a key requirement for the development and use of new drugs. This not only allows for the identification of patients for clinical trials but also provides the basis for epidemiological studies to allow the community at large to appreciate the prevalence and impact of the condition on health outcomes. Osteoporosis is a condition that has passed through all these phases, including the development of the term osteopenia [1].

The rash of recent publications on the definition and classification of cachexia and sarcopenia [2–5] seems to herald the same process for the second component of the musculoskeletal system. Skeletal muscle is among the most plastic of tissues in the human body. The gain and loss of skeletal muscle occur for a number of reasons under a variety of different physiological and metabolic conditions.

Skeletal muscle is important for whole-body protein metabolism as it is the main reservoir for amino acids to maintain protein synthesis in tissues and organs, particularly in any situation where amino acid absorption is reduced [6]. The loss of skeletal muscle mass and function is an important clinical consequence of disease, immobilization/reduced activity, poor nutrition, the use of specific medications, and aging. This loss of muscle has a number of metabolic and functional consequences that are too often not appreciated or unrecognized by clinicians.

What term should we use to delineate the phenomenon of a patient having lost enough skeletal muscle mass to have decreased quality of life or increased risk of morbidity and mortality sufficient to merit therapeutic intervention? The word sarcopenia (loss of flesh) would, at first glance, seem to be the ideal term. Baumgartner defined this originally as a skeletal muscle mass two standard deviations below that of the mean of healthy 30-year-olds [7]. Since then, the world of geriatric medicine has validated this cutoff as a useful risk index that relates loss of muscle mass in the elderly to clinically important events such as falls or the loss of independence [8]. The changing demography of Western countries (with a doubling in the over 80s in the next 20 years and the rising costs of nursing home care) has galvanized the urgency to find therapy for such "sarcopenia," and in many circles, the term sarcopenia is now synonymous with the progressive muscle wasting observed specifically in the elderly [9] (only occasionally is it to describe muscle wasting in defined illnesses like cancer [10] or renal disease). Indeed, sarcopenia is defined in Wikipedia as "the degenerative loss of skeletal muscle mass and strength associated with aging" (http://en.wikipedia.org/wiki/Sarcopenia). There are now proposals to refine the original concept and develop diagnostic criteria that encompass both loss of muscle mass and loss of function (e.g. reduced gait speed).

The development of better diagnostic criteria for the specific muscle wasting associated with the elderly is only to be applauded. However, can we readily use such criteria in younger patients? The natural loss of skeletal muscle mass is age dependent and progressive (0.5–1% loss per year after the age of 25). If we apply diagnostic criteria developed for those over 65 to patients who are aged 40, we will naturally underestimate the magnitude of their deficit. Furthermore, when we try to quantify the degree of muscle loss as a component of a complex syndrome such as cachexia, if we use the term and diagnostic criteria set out for sarcopenia in the elderly, are we going to clarify or confuse the situation? Are we not further confusing the medical and scientific communities when the term sarcopenia is used also for muscle wasting in cancer, chronic heart failure, and lung or kidney disease? In all these different conditions, the degree of muscle wasting requiring intervention may be different.

We therefore come to a dichotomy. Can we use sarcopenia as a blanket term for muscle wasting at any age and from any cause or do we accept that sarcopenia be reserved for (clinically significant) muscle wasting of the elderly? We suggest to do the latter, and it seems this is where the scientific and medical ship is cruising to. Consequently, we need a different catch-all term to indicate the presence of muscle wasting due to any illness and at any age.

The first term coming to mind is the term "muscle wasting" itself. This term is self-explanatory. However, the term is already used to describe a pathophysiologic process and not used or accepted to describe a medical entity requiring intervention. Possibly the biggest problem with this term is that it translates poorly into other languages, which has hindered widespread acceptance outside groups communicating in English. Therefore, we propose to introduce a new term: "myopenia" (Fig. 1). This term would translate well into any language and is sufficiently specific, if appropriately defined.

Myopenia is a clinically relevant degree of muscle wasting that is associated either with impaired functional capacity and/or with increased risk of morbidity or mortality. The precise cut-points to define presence of myopenia may be specific to a particular disease or condition. Myopenia can be diagnosed when a certain degree of muscle loss over time has occurred (for instance, at least 5% in 6–12 months) or when muscle mass is below a certain threshold level. For the latter, for instance, this could be a muscle mass below the 5th centile of healthy 30-year-olds or a fat-free mass index <16 kg/m^2 for men and <15 kg/m^2 for women as suggested for COPD patients to identify patients with poor functional status and higher mortality risk [11, 12]. This approach would be analogous

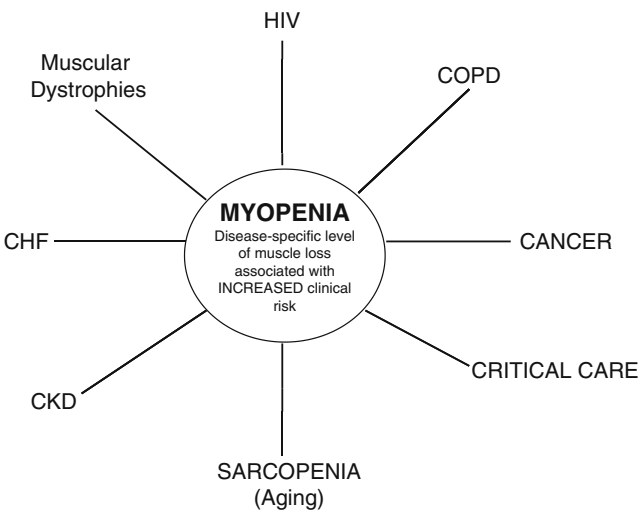

Fig. 1 Diseases that can cause clinically significant muscle wasting, i.e., myopenia

to the approach used in the body weight component of the consensus definition of cachexia [13, 14].

Future studies need to refine these cut-points in a disease-specific manner linking these cut-points to degrees of functional impairment that are clinically relevant and/or to degrees of risk of morbid or fatal events. A staging of degrees of myopenia appears possible as well.

We hope that, with this proposal, more clarity in communication is possible. We believe that the choice of the term myopenia can fit logically into the nomenclature that is developing for different kinds of wasting diseases including cachexia and sarcopenia. Of course, our proposal is open for discussion, and we look forward to it!

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