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Title
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Permalink
https://escholarship.org/uc/item/95s9q64r

Journal
Journal of Cachexia Sarcopenia and Muscle, 5(1)

ISSN
2190-5991

Authors
Anker, Stefan D
Coats, Andrew JS
Morley, John E
et al.

Publication Date
2014-03-01

DOI
10.1007/s13539-014-0135-0

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J Cachexia Sarcopenia Muscle (2014) 5:1–3
DOI 10.1007/s13539-014-0135-0

EDITORIAL

Muscle wasting disease: a proposal for a new disease classification

Stefan D. Anker · Andrew J. S. Coats · John E. Morley · Giuseppe Rosano · Roberto Bernabei · Stephan von Haehling · Kamyar Kalantar-Zadeh

Received: 27 January 2014 / Accepted: 30 January 2014 / Published online: 5 March 2014
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Abstract Muscle wasting and cachexia are the ultimate consequence of aging and a variety of acute and chronic illnesses. Significant efforts are made by many stakeholders to develop effective therapies. An important aspect of successful therapeutic development research is a common nomenclature for effective communication between researchers and clinicians, to the public, and also with regulatory bodies. Despite several efforts to develop consensus definitions for cachexia and sarcopenia, including such new terms for muscle wasting as myopenia, a common conceptual approach and acceptable vocabulary and classification system are yet to be established. Notwithstanding the potential need to translate such disease definitions and terminologies into different languages, we advocate the use of the term "muscle wasting" as the unifying entity that represents the single most common disease process across a large spectrum of cachexia and in sarcopenia-associated disorders. In this paper, we outline a first proposal for the disease nomenclature and classification of "*Muscle Wasting Diseases*." This concept can be applied in acute and chronic disease settings. It is pertinent for wasting diseases, cachexia, and sarcopenia of any severity and due to any underlying illness. The concept of muscle wasting disease underscores the most common denominator of the underlying wasting processes, i.e., muscle wasting, without ignoring the advanced disease states that are also accompanied by fat tissue wasting. The term *muscle wasting disease* is easily understood by both the scientific community and the lay public. This may promote its general use and efforts to heighten education and awareness in the field.

Keywords Cachexia · Sarcopenia · Muscle wasting disease · Definition · Treatment development

S. D. Anker (✉) · S. von Haehling
Applied Cachexia Research, Department of Cardiology, Charité Universitätsmedizin Berlin, Campus Virchow-Klinikum, Augustenburger Platz 1, D-13353 Berlin, Germany
e-mail: s.anker@cachexia.de

S. D. Anker
Department of Innovative Clinical Trials, University Medical Centre Göttingen, Göttingen, Germany

A. J. S. Coats
Monash University, Melbourne, Australia

A. J. S. Coats
Warwick University, Coventry, UK

J. E. Morley
Division of Geriatric Medicine, St Louis University School of Medicine, St. Louis, MO, USA

G. Rosano
Center for Clinical and Basic Research, IRCCS San Raffaele, Rome, Italy

R. Bernabei
Department of Gerontology and Geriatrics, Catholic University, Rome, Italy

K. Kalantar-Zadeh
Harold Simmons Center for Kidney Disease Research & Epidemiology, Division of Nephrology and Hypertension, University of California Irvine Medical Center, Orange, CA, USA

Cachexia and muscle wasting are recognized as being the consequence of aging and many illnesses and affect millions of elderly people and patients [1–3]. Both are closely associated with poor quality of life as well as significantly increased morbidity and mortality [4]. In the last decades, no therapies have been approved for muscle wasting or cachexia, but significant efforts are made by many researchers as well as numerous pharmaceutical companies [5, 6]. Therapeutic efforts involve for instances substances that are active in the ghrelin—growth hormone—insulin-like growth factor-1 pathway, specific androgen receptor modulators (SARMs), or

drugs that interfere with myostatin and activin receptors. Also, novel types of beta-blockers and anti-inflammatory compounds are in clinical testing.

An important aspect of research in any new field of therapeutic development is a common language for medical science and communication as well as for exchange with regulatory authorities. Despite several efforts to develop consensus definitions for cachexia [7, 8] or sarcopenia [9–11], and to develop new terms for muscle wasting (like myopenia) [12], a common conceptual approach and vocabulary has not yet been established. This approach should encompass all relevant types of cachexia as well as sarcopenia, and it should be universally applicable in medicine.

Over the years, we have recognized that the term "cachexia"—although understood in all languages—is somewhat suboptimal as clearly some patients with clinically important tissue wasting do not have weight loss (or even have weight gain), and, hence, they do not suffer from cachexia. Regarding the term "sarcopenia," there is no consensus whether it should be used narrowly only for aging-associated muscle wasting alone or more broadly for any muscle wasting in any illness. The term "myopenia" was suggested [12] in order to introduce a term that can describe muscle wasting in any chronic illness and to have a term that unlike "muscle wasting" is easily understood in any language.

During the recent 7th Cachexia Conference in Kobe, Japan which was organized in December 2013 [13], discussions on this issue of a common nomenclature continued. It is clear that a common nomenclature is needed to promote treatment development efforts. In the discussions, we have come to understand that for the time being, a focus on the English language for such a common nomenclature may seem appropriate as all major research discussions and publications, all international medical education efforts, as well as all international industry and regulatory discussions take place in English language. If we drop the requirement that a common disease definition term for now does not need to be translatable in many languages, then using the term "muscle wasting" will appear much more attractive.

If the above is accepted and if we also recognize that muscle wasting is the one common process in all cachexia and in sarcopenia, then we may consider all these different diseases as "muscle wasting diseases." In this paper, we would like to outline a brief proposal for such a disease classification of *muscle wasting diseases* (Fig. 1).

The proposal distinguishes between muscle wasting disease (MWD) in an acute and a chronic disease setting. The latter is the most frequent form of MWD and can be classified by its etiology (i.e., that they are due to an underlying chronic illness or aging, which is then termed sarcopenia) and by disease severity or progression. We propose that the latter also includes what is known as pre-cachexia as well as any form of cachexia (Fig. 1).

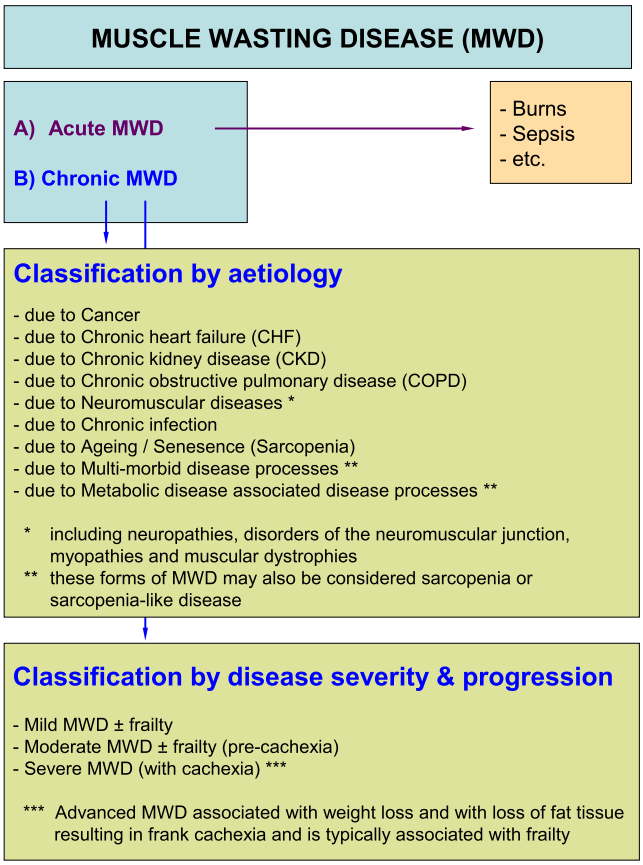

Fig. 1 Framework for the suggested classification of muscle wasting disease by disease etiology and disease progression

The suggested approach brings together the concepts of muscle wasting, sarcopenia, frailty, and cachexia. It allows the application of this concept in acute and chronic disease settings, and it is pertinent for wasting disease of any severity and due to any underlying illness. The concept of muscle wasting disease is based on the most common denominator of the underlying wasting processes, i.e., muscle wasting, without ignoring advanced disease states that are also accompanied by fat tissue wasting. Lastly, the term *muscle wasting disease* is easily understood by the scientific community as well as the lay public, which may promote its general use. The term makes no assumption about a particular pathophysiology of the disease process, and we think it is useable in all degrees of wasting disorders. The term muscle wasting disease is not fully translatable in all important languages, but we hope this shortcoming is of limited importance for scientific, treatment development, as well as regulatory discussions and possibly also in consultations with reimbursement authorities.

Further refinement of the concept of muscle wasting disease may be desirable, and we hope that this can be achieved in discussions with all stakeholders in the next year. Meetings to this end will be organized by the Society on Sarcopenia, Cachexia and Wasting Disorders. Please see www.scwd.org

for more information and contact us directly, if you are interested in participating in such deliberations.

Conflict of interest Stefan Anker, Andrew Coats, John Morley, Giuseppe Rosano, Roberto Bernabei, Stephan von Haehling, and Kamyar Kalantar-Zadeh declare that they have no conflict of interest related to the present submission.

The authors of this manuscript certify that they comply with the ethical guidelines for authorship and publishing in the Journal of Cachexia, Sarcopenia, andMuscle 2010; 1:7–8 (von Haehling S, Morley JE, Coats AJ, and Anker SD).

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