Is muscle failure a better term than sarcopenia?

Skeletal muscle is a complex tissue, important for locomotion, bone health, neuromuscular function, metabolism, as well as a reservoir in catabolic conditions e.g. surgery, infection, cancer, and trauma.[1,2] Despite the aetiological differences between sarcopenia and cachexia, low muscle mass is an independent risk factor for frailty, falls, fractures, and mortality in old age as well as a wide range of acute and chronic diseases affecting millions of people.[1,2]

The last two decades, the field of sarcopenia research has evolved dramatically and likewise the number of definitions and discussions about what it should include. Initially, the term sarcopenia was solely referring to low lean mass defined as 2SD below the normal mean of a young reference population.[3] Combining measures of lean mass with cut-off points for muscle strength (hand-grip strength, knee-extensor muscle strength) and physical function (gait speed, sit-to-stand test) has not simplified the number of ways the definition is used or interpreted. Consequently, the prevalence of sarcopenia is known to vary noticeably, depending on the studied population, measurements, and cut-off points used.[4]

An ongoing discussion within the interest field of sarcopenia is what assessments should be included, and the lack of agreement is probably due to the diverse backgrounds of the researchers involved, ranging from epidemiology to muscle physiology and cell biology.[1,2] From a more pragmatic point of view, it makes sense to include the most sensitive and simple measurements that predict sarcopenia.[5] However, we overlook many patients with some degree of muscle dysfunction if we simplify the assessments to a questionnaire and/or a measurement of hand-grip strength.

Alternatively, we could accept the complexity of skeletal muscle health being a combination of sufficient muscle tissue and neuromuscular function translating into muscle strength, muscle power, and physical performance and use the term Muscle Failure as an umbrella term for low muscle mass (sarcopenia), low muscle strength (dynapenia), and compromised physical function.

Figure 1 Muscle Failure web for clinical use to diagnose and monitor the different domains of muscle failure. Relative values (per cent of normal) as well as −1SD and −2SD below young reference. Blue dotted lines is an example of values from a 81 yr old woman from an outpatient clinic.
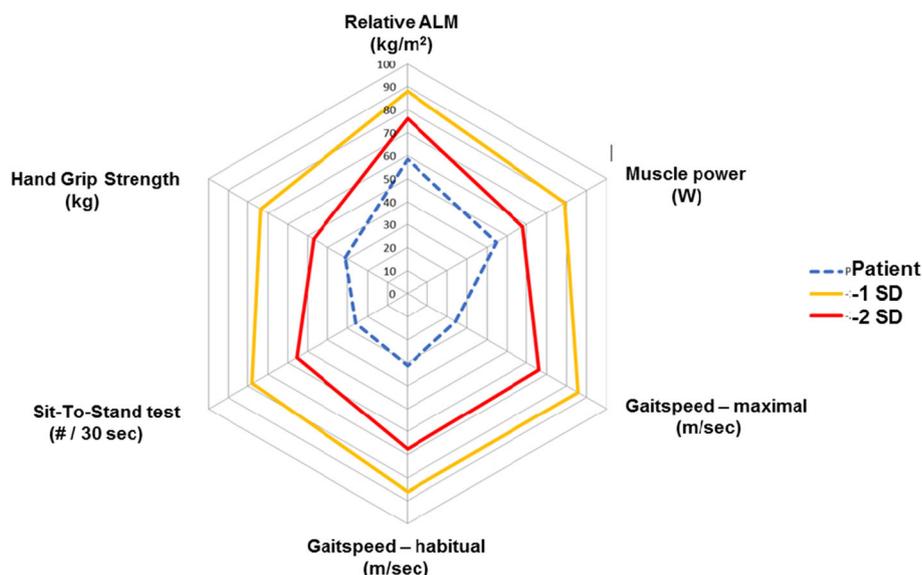
At this point in time, we believe that a distinction between different domains of muscle dysfunction would have a huge impact on the way we treat patients of all ages with muscle failure (*Figure* 1), enabling targeted individualized treatments to increase muscle mass, muscle strength, or physical function or a combination of it.

In line with heart failure, a more sophisticated approach diagnosing the type, cause, and stage of muscle failure could then guide individualized non-pharmacological and pharmacological interventions.

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