INVITED COMMENTARY

Optimizing sarcopenia screening in older patients with cardiovascular disease: insights and cut-off considerations

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This invited commentary refers to 'Screening for sarcopenia with SARC-F in older patients hospitalized with cardiovascular disease', by T. Noda et al. https://doi.org/10.1093/eurjcn/zvae017

The cardiac and peripheral muscles, pivotal in blood circulation and oxygen transportation, are essential for various functional and metabolic roles and undergo substantial changes with ageing. As a result, cardiovascular disease (CVD) and sarcopenia frequently coexist in older adults, emphasizing the urgency to effectively assess and manage these conditions. Sarcopenia is defined as the presence of low muscle mass combined with low muscle function (muscle strength or physical performance).[1,2] Various factors have been identified as contributors influencing age-related muscle loss, including inadequate nutritional intake, physical inactivity, a decrease in anabolic hormones, and a chronic inflammatory state (inflammageing), among others.[3] This muscle loss can be accelerated with comorbidities such as cancer, heart failure, coronary disease, diabetes, and prolonged immobilization. Sarcopenia is notably prevalent among patients with CVD and is associated with an increased risk of various adverse events.[3] A recent systematic review estimated that sarcopenia affects 35% (95% confidence interval: 28–42%) of patients with CVD, a rate significantly higher than its prevalence in the general population.[4,5]
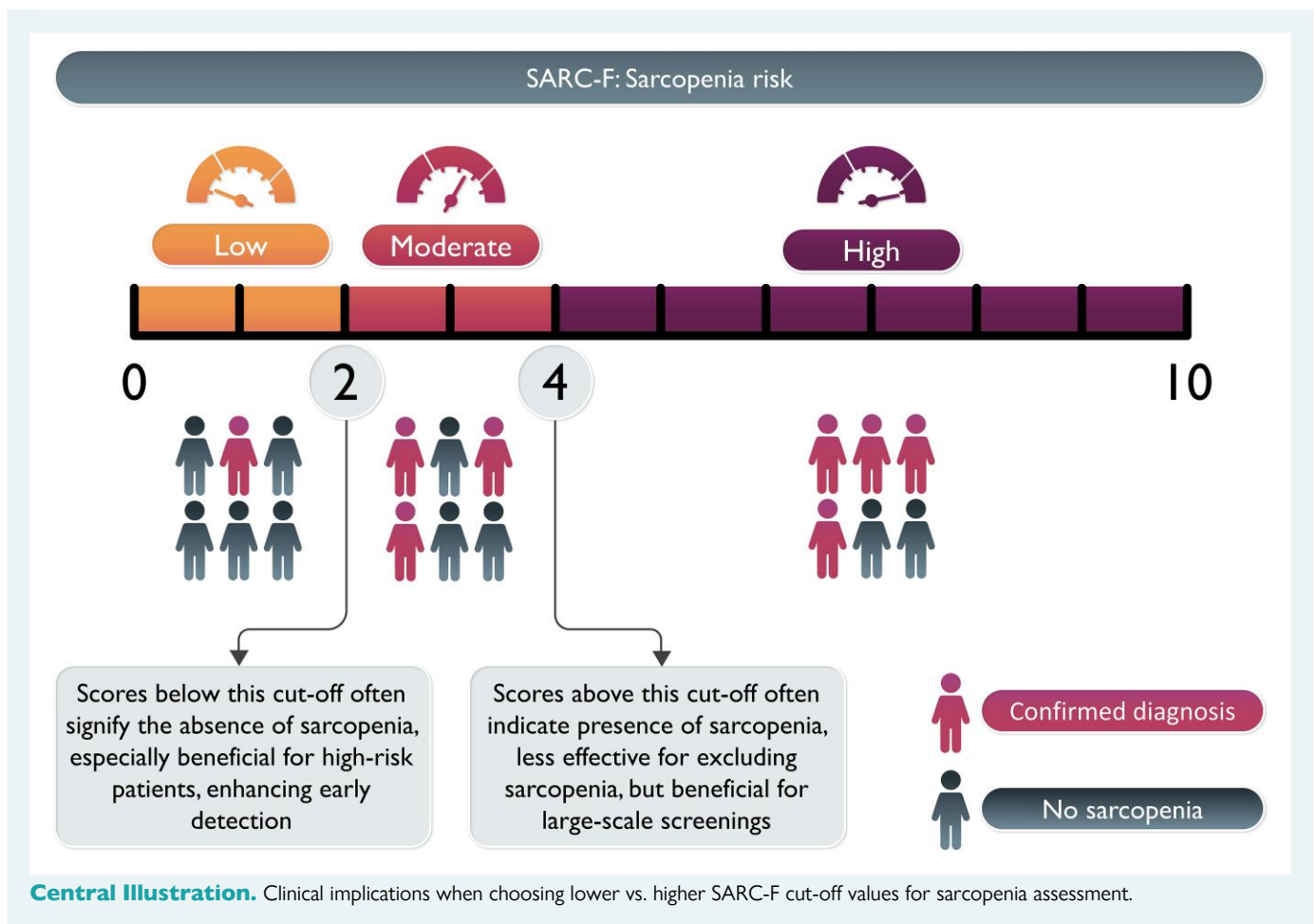
The high prevalence of sarcopenia and its negative clinical consequences in patients with CVD underscores the critical need for routine screening for early sarcopenia detection, ensuring timely intervention. The European and Asian Working Groups on sarcopenia recommend SARC-F as an easily administered screening questionnaire that gathers self-reported data from patients with signs indicative of sarcopenia.[1,2] The SARC-F consists of five items encompassing muscle strength (S), assistance in walking (A), rising from a chair (R), climbing stairs (C), and falling (F). It has been validated for its effectiveness in identifying individuals at risk for adverse outcomes related to sarcopenia.[6,7] Moreover, SARC-F assigns scores ranging from 0 to 10, where 0 represents the optimal physical performance and 10 reflects the poorest.

Typically, a cut-off score of ≥ 4 points is recommended to identify those at risk for sarcopenia.[7] However, research on the ideal cut-off score has varied, reflecting the diverse characteristics of the populations studied.[8–10] Lower SARC-F cut-off values increase the test's sensitivity, reduce the number of false negatives, and ensure that fewer cases of sarcopenia are missed. However, this approach increases the number of individuals requiring further muscle assessments. Conversely, higher cut-off values improve the test's specificity, indicating that individuals scoring above the threshold are more likely to truly have sarcopenia. This increase in specificity, though, results in a higher occurrence of false negatives, where some individuals with sarcopenia might not be identified and treated. In addition, it is essential to consider not only sensitivity and specificity but also the negative predictive value (NPV) and positive predictive value when selecting a cut-off. The NPV becomes particularly crucial in this context; a high NPV indicates that a negative test result reliably identifies individuals without sarcopenia, reducing the chance of missing patients with sarcopenia who would require further evaluation and treatment.

While SARC-F's effectiveness has been predominantly validated in community-dwelling older adults,[6] there has been less research focusing on its application in patients with CVD. Interestingly, in this issue of the *European Journal of Cardiovascular Nursing*, Noda et al.[11] investigated the SARC-F score with the highest sensitivity and specificity values to identify sarcopenia in older patients with CVD. A total of 1066 patients aged ≥65 years were included in the study, with 33.9% hospitalized for heart failure, 23.1% for acute coronary syndrome, and 15.9% for aortic disease.[11] Sarcopenia at discharge was determined using the Asia Working Group for Sarcopenia criteria[2] and was observed in 37.6% of participants. Those identified with this condition exhibited advanced age and a lower body mass index compared with their counterparts without sarcopenia.[11] The median SARC-F score was recorded at 2 points (inter-quartile range: 1–3 points). Notably, even among individuals with low SARC-F scores (2 or 3 points), ~40% had a confirmed sarcopenia diagnosis.[11] The conventional SARC-F cut-off ≥ 4 demonstrated a sensitivity of 30.2% and a specificity of 84.4%.[11] Conversely,

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Central Illustration. Clinical implications when choosing lower vs. higher SARC-F cut-off values for sarcopenia assessment.

using a SARC-F cut-off ≥ 2 for all patients resulted in the most balanced diagnostic performance, achieving a sensitivity of 68.3% and a specificity of 55%.[11] Additionally, the authors highlighted that the optimal cut-off values vary by sex and specific cardiovascular diagnoses. Notably, a cut-off of 3 points provided the best balance of sensitivity and specificity for females, particularly in the case of heart failure. In contrast, a cut-off of 2 points proved more suitable for males and those with myocardial infarction.[11]

The findings from Noda et al.[11] align with prior studies in community-dwelling outpatients and those with chronic liver disease.[8,9] These studies also reported that lower cut-offs (≥1 and ≥2 points) are more effective in detecting sarcopenia or probable sarcopenia than the traditional threshold of 4 points.[8,9] Additionally, for populations at increased risk of sarcopenia, modified versions of the SARC-F questionnaire that include measurements like calf or arm circumference are promising.[12,13] These adaptations have demonstrated superior diagnostic performance compared with the original questionnaire.[14] The substantial prevalence of sarcopenia and its adverse outcomes in patients with heart failure has also been acknowledged in the latest 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure.[15] Therefore, in line with the latest guidelines for sarcopenia assessment and treatment,[1,2,16] we emphasize the significance of using screening tools such as the SARC-F questionnaire. However, it is crucial to complement this with a thorough evaluation of the patient's clinical history and surrogate indicators, including clinical symptoms, risk factors, chronic disease presence, and recent hospitalizations. Integrating this comprehensive information is critical for decision-making

regarding further assessment and treatment of sarcopenia. The study by Noda et al.[11] underscores the importance of SARC-F scores, while also emphasizing the need to pay particular attention to lower scores, especially in individuals with additional risk factors for sarcopenia. The Central Illustration demonstrates the clinical implications and the balance needed when choosing lower vs. higher SARC-F cut-off values for sarcopenia assessment.

By optimizing the balance between sensitivity, specificity, and predictive values, healthcare providers can more effectively identify and manage sarcopenia in older adults with CVD, improving patient outcomes and resource allocation in clinical settings.

Conflict of interest: none declared.

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