Diagnostic Tools for Sarcopenia: Can We Get Less Expensive and Accurate Methods?

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Sarcopenia, as defined by the European Working Group on Sarcopenia (EWGSOP) in Older People is "*a progressive and generalized skeletal muscle disorder that is associated with increased likelihood of adverse outcomes including falls, fractures, physical disability, and mortality*".[1] The first EWGSOP and Asian Working Group for Sarcopenia used muscle mass to define sarcopenia, which is diagnosed by using Dual-energy X-Ray absorptiometry (DXA). However, the cut-off from several countries in Asian showed different cut-off value for different age groups and BMI. In addition, not all hospitals and countries can afford DXA to be used as daily diagnostic routine for sarcopenia.[2]

In 2018, EWGSOP made a revision regarding sarcopenia, as well as the diagnostic test and cut-off value (EWGSOP2). EWGSOP2 recommends using self-questionnaire, known as SARC-F as sarcopenia screening, especially in community-dwelling elderly. SARC-F consisted of 5 questions regarding patient's perception of his or her limitations in strength, walking ability, rising from a chair, stair climbing and experiences with falls. This is more feasible to be done in countries without advanced muscle mass measurement tools. Several parameters in sarcopenia are muscle strength, muscle quantity, and physical performance. In muscle strength, measuring grip strength can be done as predictor for patients' outcomes, such as hospitalization and quality of life. For muscle quantity, the gold standards are Magnetic resonance imaging (MRI) and computed tomography (CT). However, since both are expensive, and the cut-off points have not been defined yet, DXA and Bioelectrical impedance analysis (BIA) can be a substitute. Current evidence showed that DXA still does not give consistent results and not yet portable for the use in the community. On the other hand, BIA measure muscle mass using the whole-body electrical conductivity and less expensive than the other tools, thus can be used in the community setting. However, there is no specific cut-off for BIA especially in elderly. For physical performance, several tests can be done, such as gait speed and Timed-Up and Go test (TUG).

Study done by Setiati, et al showed that SARC-F combined with calf and/or thigh circumference measurement can be used in community and hospital setting to make diagnosis of sarcopenia as it has high specificity value. Both calf and thigh circumference measurement can be widely used in community elderly as it does not use expensive equipment and it complements to establish sarcopenia diagnosis. This research is a novel study as past studies did not combine both calf and/or thigh circumference with SARC-F. Past studies used only calf or thigh circumference to complement SARC-F to establish sarcopenia.

Furthermore, Laksmi, et al did a research

to find the cut-off value of BIA in comparison to DXA and found out that the sensitivity and specificity for male was 70.6% and 82.8% (BIA <6.9 kg/m^2) and for female was 85.7% and 97% (BIA <5 kg/m^2). BIA is not as expensive as DXA and it can be used in community setting thus it make clinicians easier to measure muscle quantity as part of the sarcopenia. The cut-off value in the study slightly below the normal cut-off value for BIA based on EWGSOP, which was <7 kg/m^2 for male and <5.7 kg/m^2 for female. BIA, even though not all hospitals have the tool, it is more feasible to be find and used compared to DXA, thus this is a promising evidence about sarcopenia diagnosis research.

Further research in different settings are still required regarding the external validation for both studies mentioned above to ensure the applicability of the tools in all levels of health care services, as currently there are no external validations for those tools.

REFERENCES

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