

Muscle Mass Measured by Bioelectrical Impedance Analysis was Associated With Handgrip Strength but not With Chair Stands Time in Older Falls Clinic Attendees

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Background

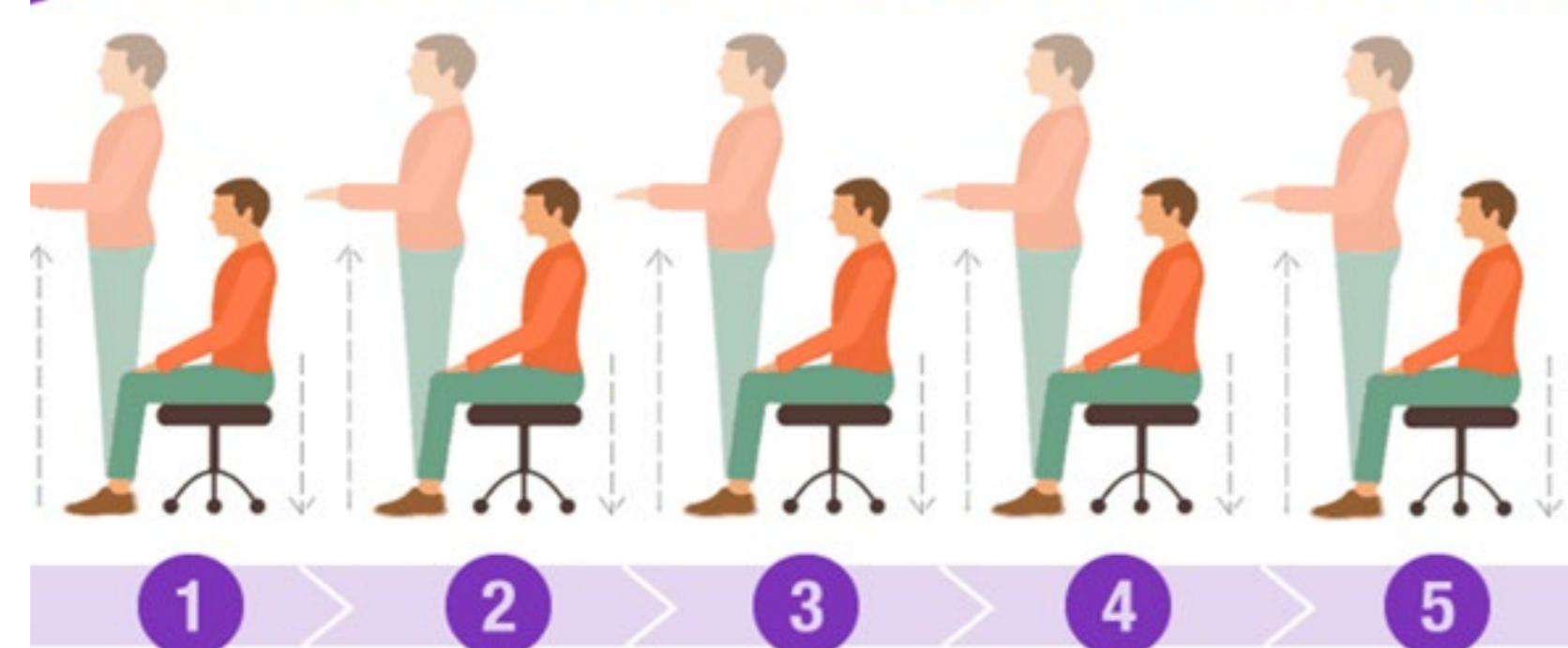
- Sarcopenia, an accelerated loss of muscle mass and strength with ageing, is a major global health burden.
- The European Working Group on Sarcopenia in Older People (EWGSOP) revised guidelines recommend assessing probable sarcopenia with both hand grip strength (HGS) and time on the five chair stands test (5CST).
- Recent research from the Tromsø Study survey (Johansson, 2020) has shown the prevalence of sarcopenia varies significantly depending on which measure is used: from 1.3% based on HGS to 4.4% based on 5CST.
- They also found significant differences in the anthropometric characteristics of those characterised as sarcopenia with HGS compared with those characterised with 5CST.
- We sought to investigate how these measures were associated with bioelectrical impedance analysis (BIA) measured muscle mass in older falls clinic attendees.

Methods

- Attendees to a falls and syncope unit, over the age of 50 years were recruited.
- HGS was measured with a handheld dynamometer.
- The maximum value of 2 attempts, seated, on both hands was taken.
- Time on the 5CST was assessed as the time in seconds taken to stand up and sit down 5 times from a standard height chair.



How Fast Can You Stand Up and Sit Down 5 Times?



- Appendicular skeletal muscle mass (ASM) was derived from the Sergej equation using BIA (TANITA® DC-430MAP).
- Sarcopenia was defined as per the EWGSOP revised guidelines:
 - Probable sarcopenia was defined as HGS < 16 kg for women and < 27 kg for men, or taking > 15 s to perform 5CST.
 - Confirmed sarcopenia was defined as further having ASM < 20 kg for men and < 16kg for women.
- Multivariable linear regressions (adjusted for age and sex) were computed to assess HGS/5CST as independent predictors of ASM.



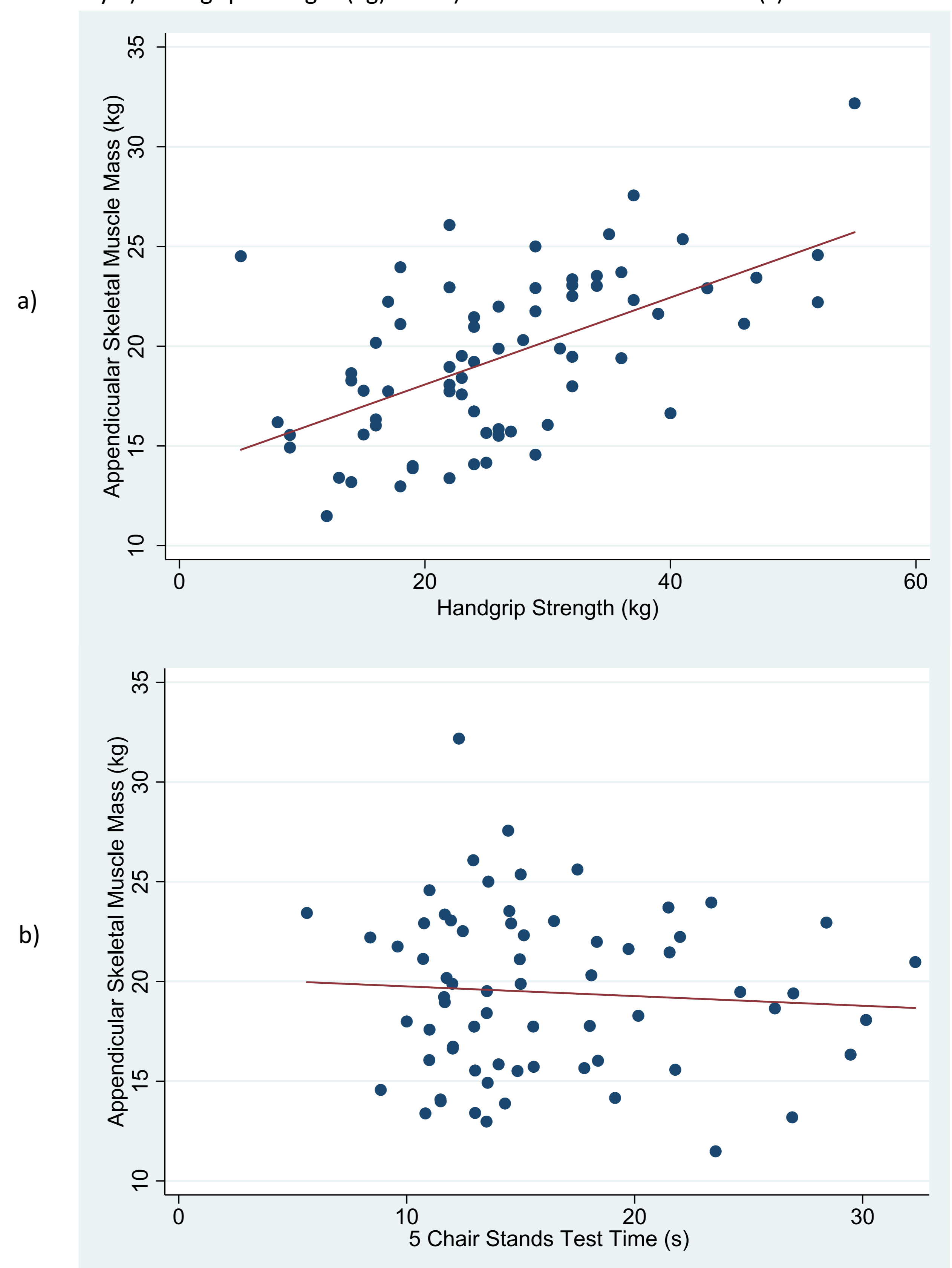
Results

N = 74 Average Age 71 YEARS Range 50-93 54% Female 46% Male

28% probable sarcopenia HGS Criteria 16% sarcopenia

42% probable sarcopenia 5CST Criteria

Scatterplot and Linear Regression of Appendicular Skeletal Muscle Mass (kg) by a) Handgrip Strength (kg) and b) Time on 5 Chair Stand Test (s)



- Linear regression, adjusted for age & sex, showed that there was a significant positive association between ASM and HGS ($\beta = 0.10$, $P < 0.05$, $R^2 = 0.46$).
- However, there was no significant association between ASM and 5CST time ($\beta = -0.01$, $P = 0.87$, $R^2 = 0.46$).

Discussion

- Muscle mass measured by BIA was associated with HGS, independent of age and sex, but not with 5CST in this sample.
- This suggests that HGS may be a more useful test than 5CST for assessing probable sarcopenia in clinical settings where direct measurement of muscle mass may not be practical.
- Further research should investigate the clinical utility of measurement of probable sarcopenia in falls clinics.