APPENDICULAR SKELETAL MUSCLE MASS: MEASUREMENT WITH SINGLE FREQUENCY BIOIMPEDANCE ANALYSIS (BIA).

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Practical Implications:

- These results suggest that the Tanita BIA system may provide a reliable and practical method of estimating leg skeletal muscle mass that requires only minimal technician training.
- There was a significant correlation ($r=0.89$, $p<0.001$) between height^2/Tanita-Z and lower extremity ASM measured by DXA.
- Tanita assessed lower extremity ASM more accurately (as per DXA) than anthropometric measurements of the thigh and calf.

ABSTRACT

Objective: Dual-energy x-ray absorptiometry (DXA) provides a validated approach to measuring appendicular skeletal muscle (ASM). The recent development of a 50 KHz BIA analyzer (TBF 105, Tanita Corp. Tokyo, Japan) presents a new way of quantifying leg skeletal muscle mass by simultaneously measuring body weight and impedance (Z) across both legs without application of gel electrodes. We hypothesized that Z measured across both legs is related to lower extremity ASM. The aim of the present study was to test this hypothesis by correlating lower extremity Z derived by Tanita BIA with ASM measured by DXA.

Design: Subjects were 90 males & 118 females ages 18-79 yrs. with BMI<30 kg/m^2.

Results: The between-day CV for Z was 2.2% (n=5) and there was a high correlation (n=9; $r=0.96$, $p<0.001$) between Tanita-measured Z and lower extremity Z measured with conventional BIA/gel electrodes. There was a highly significant correlation ($r=0.89$, $p<0.001$) between height^2/Tanita-Z and lower extremity ASM. A significant but lower correlation was observed between anthropometric thigh+calf muscle areas and lower extremity ASM ($r=0.86$, $p<0.001$). These results suggest that the new non-gel electrode BIA system may provide a reliable and practical method of estimating leg skeletal muscle mass that requires only minimal technician training.

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