

BODY COMPOSITION MEASUREMENT IN FEMALES WITH LEG-TO-LEG BIOELECTRICAL IMPEDANCE ANALYSIS COMPARED TO DEXA

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Practical Implications:

- Tanita leg-to-leg bioelectrical impedance analysis system accurately assesses body fat and fat free mass in females as compared to DEXA.
- A Bland-Altman plot showed no significant systematic difference between the two methods.

ABSTRACT

Objective: This study determined the validity of the leg-to-leg bioelectrical impedance analysis (BIA) system (Tanita Body Fat Analyzer, TBF 105, Tanita Corporation of America, Inc., Arlington Heights, IL) in estimating body composition in a heterogeneous group of females (N=255) [mean±SD, age, 42.9±15.6 yr (range, 18-88 yr); body mass, 74.8±16.7 kg (33.8-120.5 kg); height, 162±7 cm (144-179 cm); body mass index, 28.4±6.0 kg/m² (15.9-41.9 kg/m²)].

Materials & Method: Fat-free mass (FFM) and percent body fat (BF) were estimated using BIA and dual energy X-ray absorptiometry (DEXA) (Lunar DPX, Lunar Radiation Corp, Madison, WI). Prior to testing, subjects were required to adhere to standard BIA testing guidelines, and bioelectrical impedance was measured in subjects standing erect with bare feet on the analyzer's footpads, and wearing minimal clothing. FFM and BF from BIA were calculated using the prediction equation

supplied by the manufacturer (which uses body mass, age, and an impedance index, height²/impedance).

Results: A Bland-Altman plot of difference between FFM and BF measured by DEXA and BIA versus average FFM and BF by the two methods showed no significant systematic difference (mean difference, -1.2±3.0 kg, and 1.7±4.2%, respectively). FFM was estimated at 44.8±5.6 kg with DEXA, and 46.0±4.8 kg with BIA (r=0.84, P<0.001; SEE 3.0 kg). BF was estimated at 38.2±10.2% with DEXA, and 36.5±9.8% with BIA (r=0.91, P<0.001; SEE 4.2%). These data indicate that the leg-to-leg bioelectrical impedance system accurately assesses FFM and BF in females when compared to DEXA. Supported by a grant from the Tanita Corporation of America, Inc.

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