

Bioelectrical Impedance Analysis (BIA) Using Bipolar Foot Electrodes in the Assessment of Body Composition in Type 2 Diabetes Mellitus

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Practical Implications:

- BIA using bipolar foot electrodes provides a valid estimate of % body fat in subjects with Type 2 diabetes mellitus. It does not require examiner skill, is rapid, portable, and free from discomfort.
- % Body Fat determined via bipolar foot electrode BIA correlates well with DXA.
- There is a consistent gender bias using BIA, however, this is small and probably of no clinical significance.

ABSTRACT

Objective: The use of bioelectrical impedance analysis (BIA) for determining human body composition is widely accepted as a safe, rapid and reliable technique. Although this technique has been validated in normal and obese individuals, only limited studies have been done in special populations. The use of BIA for the measurement of body composition in Type 2 (non-insulin dependent) diabetic patients would be of particular interest for both clinical and investigative studies. The aim of this study was to evaluate the validity of a new bipedal BIA device for the measurement of body composition in a population of individuals with Type 2 diabetes mellitus.

Design: The body composition of 48 male and 48 female Type 2 subjects was measured by BIA and dual energy X-ray absorptiometry (DXA).

Results: The percentage body fat determined by BIA was significantly correlated with % body fat determined by DXA ($r=0.89$, $p<0.0001$). Agreement analysis showed that BIA consistently overestimated % fat in female diabetic subjects by approximately 5% and underestimated % fat in male diabetic subjects by approximately 10% of the predicted value obtained with DXA. These differences were statistically significant but probably of minor clinical relevance. We conclude that BIA measurement by TBF 105 is a useful and reliable technique for measuring body composition in subjects with Type 2 diabetes mellitus.

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