

VAL 97 – Comparison of various methods of body fat analysis in overweight and obese women

OBJECTIVE: Body composition assessment and determination of the amount and distribution of body fat, respectively, form an essential part of the basic clinical assessment of an obese patient. However, there are no recommended methods to determine the amount of fat in obese population. The aim of our study was to compare the methods most frequently used to determine the amount of body fat in overweight and obese women in clinical practice (multi-frequency bio-electrical impedance analysis--BIA using the Bodystat, Omron and Tanita machines and the skinfold test using a calliper) with a reference method (DEXA). The study further aimed to compile prediction formulae enabling clinicians to calculate the percentage of body fat when using the available body fat measurement techniques.

SUBJECTS /METHODS: The study included 61 overweight and obese women (mean age 48.6 years +/- 13.9 years). Four practice-based body fat assessment methods were used - bioimpedance technique with tetra-polar electrode arrangement (Bodystat machine), bioimpedance technique with bi-pedal electrode arrangement (Tanita machine), hand-held bioimpedance technique (Omron machine) and the anthropometry assessment--the skinfold calliper technique. These methods were compared to the method considered as the reference--the whole body densitometry (DEXA).

RESULTS: The results obtained using the listed body fat assessment methods suggest that the resulting body fat measurements differ importantly depending on the method used. **The highest correlation with DEXA was found for the Bodystat BIA ($r = 0.9096$, $p < 0.001$).** Prediction formulae were constructed for a more accurate calculation of body fat content when using the techniques evaluated in the present study.

CONCLUSION: When the newly compiled formulae are employed, the body fat assessment obtained with any of the methods applied in the present study will approximate DEXA. The BIA techniques were found to be particularly precise. Therefore, further evaluation of these techniques is recommendable to support their use as methods for monitoring the efficacy of weight reduction programmes in overweight and obese patients.

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