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Comparison of Measured and Predicted Resting Energy Expenditure Equations in Obese Pre-bariatric Surgery Patients

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PURPOSE: To compare measured resting energy expenditure (MREE) to predicted resting energy expenditure (PREE) determined by three pre-programmed multi-frequency bioelectrical impedance analysis prediction equations in obese pre-bariatric surgery patients. **METHODS:** Ninety women and twenty-six men (age: 42.6 ± 11.0 years, BMI: 48.1 ± 9.1 kg/m²) were included in this sample. After 3 hours of seated rest, MREE was measured prior to bioelectrical impedance analysis (SECA-mBCA 514) body composition assessment. MREE was obtained over a 10-minute period using a hand-held indirect calorimetry device (Korr REE-VUE). Three preprogrammed equations in the bioelectrical impedance analyzer (i.e. Mueller 2004, Liu 1995, and FAO/WHO/UHU) were used to calculate PREE. **RESULTS:** The mean MREE determined by indirect calorimetry was 2164.1 ± 460.2 kcal. The PREE values (mean \pm SD) for the Mueller, FAO/WHO/UHU, and Liu equations were 2182.5 ± 427.8 kcal, 2129.2 ± 521.2 kcal, and 2352.2 ± 473.4 kcal, respectively. Following statistical comparison, no significant differences were observed between MREE and PREE determined by the Mueller (14.6 ± 313.6 kcal, $p = 0.896$) and FAO/WHO/UHU (-38.8 ± 371.8 kcal, $p = 0.102$) equations. However, a significant difference was observed between MREE and PREE by Liu (184.2 ± 333.3 kcal, $p = 0.003$). **CONCLUSIONS:** Our findings indicate that the Mueller and FAO/WHO/UHU programmed bioelectrical impedance analysis equations produce similar resting energy expenditure values as indirect calorimetry. These findings are important to weight management clinics without access to indirect calorimetry that currently use or are considering the use of this bioelectrical impedance analysis technology for their patients. Resting energy expenditure can be predicted in obese patients prior to individualized diet and exercise programming.