Prediction of resting energy expenditure in severely obese Italian women

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The aims of the present study were to develop and cross-validate new equations for predicting resting energy expenditure (PREE) in severely obese Italian women, and to compare their accuracy with those of the Harris-Benedict, Bernstein, WHO/FAO/UNU, Owen, Mifflin, Nelson, Siervo, Huang and Livingston equations to predict REE, using the Bland-Altman method. One hundred and eighty two women [mean body mass index (BMI) 45.6 kg/m^2; 56.7% fat mass (FM)], aged 19 to 60 yr participated in this study. REE was measured by indirect calorimetry and body composition by bioelectrical analysis. Equations were derived by stepwise multiple regression analysis, using a calibration group and tested against the validation group. Two new specific equations based on anthropometric REE=Weightx0.042+Heightx3.619-2.678 (R^2=0.66, SE=0.56 MJ) or body composition parameters REE=FFMx0.067+FMx0.046+1.568 (R^2=0.63, SE=0.58 MJ) were generated. Mean PREE were no different from the mean measured resting energy expenditure (MREE) (<1%, *p*>0.800) and REE was predicted accurately (95-105% of MREE) in 60% of subjects. The WHO/FAO/UNU, Harris-Benedict and Siervo equations showed mean differences <2% and PREE was accurate in <44% of subjects. The Huang, Mifflin and Livingston equations showed a mean PREE underestimation (>5.0%, *p*<0.001) and PREE was accurate in <38% of subjects. The Owen, Bernstein and Nelson equations showed a greater PREE underestimation (>14%, *p*<0.001) in >90% of subjects. The new prediction equations allow an accurate estimation of REE in groups of severely obese women and result in lower mean differences and lower limits of agreement between PREE and MREE than commonly used equations.