

Comparison of predictive equations for resting energy expenditure in severely obese Caucasian children and adolescents

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The objective of the present study was to compare resting energy expenditure (REE) calculated by different predictive equations (McDuffie, Derumeaux, Tverskaya, Schofield, FAO/WHO/UNU, Harris-Benedict and Lazzer-Sartorio) to REE measured in severely obese Caucasian children and adolescents. Two hundred and eighty-seven obese children and adolescents (121 males, 166 females, mean age: 14.5 yr, mean body mass index (BMI) z-score: 3.3) participated in this study. REE was measured (MREE) by indirect calorimetry and body composition by bioelectrical impedance analysis. The FAO/WHO/UNU equations showed the lowest mean difference between predicted resting energy expenditure (PREE) and MREE (+ 0.2%, $p=ns$), but the higher SD (± 1.16 MJ) and the PREE were accurate in 26% of subjects. The Tverskaya, Derumeaux and Harris-Benedict equations significantly underestimated REE in all children and adolescents (- 7.6, - 4.1, and - 2.4%, respectively, $p<0.05$), while the Schofield and McDuffie equations overestimated REE (+ 2.5, + 5 and 25%, respectively, $p<0.05$). By contrast, the Lazzer-Sartorio equations showed the greater agreement and accuracy (in 55% of subjects) between mean PREEs and MREE for all children and adolescents, as well as for boys and girls (+1.6%, $p=ns$). In conclusion, Lazzer-Sartorio equations showed an accurate estimation of REE in groups of severely obese children and adolescents, resulting in lower mean differences and SD and higher accuracy between PREE and MREE than the other equations considered in this study.

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