Intra- and interindividual variability of resting energy expenditure in healthy male subjects -- biological and methodological variability of resting energy expenditure

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The objective of the present study was to investigate the contribution of intra-individual variance of resting energy expenditure (REE) to interindividual variance in REE. REE was measured longitudinally in a sample of twenty-three healthy men using indirect calorimetry. Over a period of 2 months, two consecutive measurements were done in the whole group. In subgroups of seventeen and eleven subjects, three and four consecutive measurements were performed over a period of 6 months. Data analysis followed a standard protocol considering the last 15 min of each measurement period and alternatively an optimised protocol with strict inclusion criteria. Intra-individual variance in REE and body composition measurements (CV(intra)) as well as interindividual variance (CV(inter)) were calculated and compared with each other as well as with REE prediction from a population-specific formula. Mean CV(intra) for measured REE and fat-free mass (FFM) ranged from 5.0 to 5.6 % and from 1.3 to 1.6 %, respectively. CV(intra) did not change with the number of repeated measurements or the type of protocol (standard v. optimised protocol). CV(inter) for REE and REE adjusted for FFM (REE(adj)) ranged from 12.1 to 16.1 % and from 10.4 to 13.6 %, respectively. We calculated total error to be 8 %. Variance in body composition (CV(intra) FFM) explains 19 % of the variability in REE(adj), whereas the remaining 81 % is explained by the variability of the metabolic rate (CV(intra) REE). We conclude that CV(intra) of REE measurements was neither influenced by type of protocol for data analysis nor by the number of repeated measurements. About 20 % of the variance in REE(adj) is explained by variance in body composition.

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