Validation of an equation for resting metabolic rate in older obese, critically ill patients.

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Abstract

Background:
In previous studies, the Penn State (PSU) equation was found to be a valid way to predict resting metabolic rate (RMR) in critically ill patients, with the exception of those who were aged 60 years or older and had a body mass index (BMI) ≥30 kg/m². A modification of the equation was proposed in this specific patient population. The current study was designed to test the validity of that equation and to retest the validity of the original equation.

Methods:
RMR was measured using a standardized evidence-based protocol. Metabolic rates predicted with the PSU equation and a modification of it (PSU[m]) were compared with the measured values. Fifty patients were studied prospectively. Data were used from an additional 75 subjects from previous studies that had not been used to develop either of the equations being tested in the current study. This brought the final number of subjects for each equation to 74 for PSU(m) and 106 for PSU.

Results:
The PSU(m) equation was found to be biased by a narrow margin (95% confidence interval, -87 to -4 kcal/d), but both versions of the equation were precise. Accuracy rate for the PSU(m) equation was 74%, compared with 58% for the PSU equation (P < .04).

Conclusions:
The PSU(m) equation for predicting RMR in critically ill, mechanically ventilated patients is valid in patients aged cases where age is ≥60 years or older whose BMI is ≥30 kg/m².

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