Abstract

Background: The prevalence of overweight and obesity in Mexico is approximately 70%; thus, obtaining a reliable measurement of the resting energy expenditure (REE) in these patients is of extreme importance. The aim of the study was to obtain a prediction equation of REE in overweight or obese outpatients in the Mexican population. Methods: The study was conducted at The National Institute for Medical Sciences and Nutrition Salvador Zubirán (Mexico, D.F.). Consecutive outpatients (18-70 years old) at the Clinical Nutrition were evaluated between March 2010 and August 2012 after being diagnosed with overweight or obesity (body mass index [BMI] ≥ 25 kg/m²). Patients with any disease that could affect the measurement of gas exchange were excluded. Participants were evaluated by indirect calorimetry (IC), bioelectrical impedance analysis (BIA) and anthropometric measurements to design the REE prediction equation. Two groups were evaluated: one group for derivation and another group for validation. The REE was also estimated using the equations of Harris-Benedict, Mifflin St-Jeor, Ireton-Jones, Carrasco, Kleiber and Owen, assessing current weight, ideal weight and adjusted weight. A REE equation was obtained by multiple linear regression based on the evaluated variables, and those that gave the best precision to the model were selected. The real REE and the estimated REE were then compared using Student’s t-test. To highlight differences, pairs of measurements were further analyzed using the Bland & Altman plot. Pearson correlation coefficients and coefficients of determination between REE values measured by IC and REE values estimated using various formulas were calculated. Results: A total of 77 patients were included in the derivation group: 38 men (49.4%) and 39 women (50.6%). The mean age was 48.5 ± 13.9 years, and the mean BMI was 34.7 ± 5.7 kg/m². A total of 50 participants were included in the validation group: 16 men (32%) and 34 women (68%). The mean age was 48.5 ± 15.5 years, and the mean BMI was 34.2 ± 5.2 kg/m². The baseline characteristics of both groups were homogeneous. IC reported an average of 2001 ± 552 kcal, with a respiratory quotient (RQ) of 0.75 ± 0.04. The new REE equation that resulted from the statistical model had an R² = 0.52 and a bias of ± 3.39 kcal. When the REE obtained from IC was compared with the REE estimated by the new formula, there was no significant difference between the results, and the correlation for all participants was 0.71 (p <0.0001). When the equations were analyzed using the Bland-Altman method, the difference between the new formula and the REE measurement by IC was a bias of 3.39 ± 384 kcal. Furthermore, a correlation was obtained between the real and estimated REE values using different equations; the most accurate correlation with the new formula was Owen’s formula (r=0.712). Conclusion: The new formula had an acceptable correlation with IC REE measurement in overweight and obese patients in the Mexican population.
population. This equation may represent a useful tool for health care professionals who do not have access to IC equipment for the estimation of REE.

**Keywords**

Indirect calorimetry, resting energy expenditure, prediction equation, obesity, overweight.