New body fat prediction equations for severely obese patients

Lilian Mika Horie a,*, Maria Cristina Gonzalez Barbosa-Silva b, Raquel Susana Torrinhas a, Marco Túlio de Mello c, Ivan Cecconello a, Dan Linetzky Waitzberg a

a Department of Gastroenterology, Digestive Surgery Division—LIM 35, University of São Paulo School of Medicine, São Paulo, Brazil
b Department of Surgery and Post Graduation in Health and Behavior, Catholic University of Pelotas, Pelotas, Brazil
c Department of Psychobiology, Federal University of São Paulo, São Paulo, Brazil

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Summary
Background & aims: Severe obesity imposes physical limitations to body composition assessment. Our aim was to compare body fat (BF) estimations of severely obese patients obtained by bioelectrical impedance (BIA) and air displacement plethysmography (ADP) for development of new equations for BF prediction.

Methods: Severely obese subjects (83 female/36 male, mean age 41.6 ± 11.6 years) had BF estimated by BIA and ADP. The agreement of the data was evaluated using Bland-Altman’s graphic and concordance correlation coefficient (CCC). A multivariate regression analysis was performed to develop and validate new predictive equations.

Results: BF estimations from BIA (64.8 ± 15 kg) and ADP (65.6 ± 16.4 kg) did not differ (p > 0.05, with good accuracy, precision, and CCC), but the Bland–Altman graphic showed a wide limit of agreement (−10.4; 8.8). The standard BIA equation overestimated BF in women (−1.3 kg) and underestimated BF in men (5.6 kg; p < 0.05). Two BF new predictive equations were generated after BIA measurement, which predicted BF with higher accuracy, precision, CCC, and limits of agreement than the standard BIA equation.

Conclusions: Standard BIA equations were inadequate for estimating BF in severely obese patients. Equations developed especially for this population provide more accurate BF assessment.

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* Corresponding author. Avenida Dr. Arnaldo, 455. Sala 2208, CEP: 01246-903, Cerqueira Cesar, São Paulo-SP, Brazil. Tel.: +55 11 30620841; fax: +55 11 30617459.
E-mail address: mikahorie@yahoo.com.br (L.M. Horie).

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