TACSM Abstract


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ABSTRACT
The ease of calculating body mass index (BMI)-based body fat percentage (BF%) is appealing in collegiate male soccer player who have limited time availability and strict training regimens. However, research has yet to evaluate whether BMI-based BF% equations are valid when compared to a criterion multi-compartment model. PURPOSE: The purpose of this study was to compare BMI-based BF% equations with a three-compartment (3C) model in collegiate male soccer players. METHODS: Sixteen NCAA Division II male soccer players (age = 21 ± 2 years; ht = 179.0 ± 8.2 cm; wt = 78.0 ± 8.5 kg) participated in this study. BMI was calculated as weight (kg) divided by height squared (m²). BF% was predicted with the BMI-based equations of Jackson et al. (BMIJA), Deurenberg et al. (BMIDE), Gallagher et al. (BMIGA), and Womersley and Durnin (BMIWO). The criterion 3C model BF% was determined using air displacement plethysmography (BOD POD®) for body volume and bioimpedance spectroscopy for total body water. RESULTS: The BMI-based BF% equations significantly overestimated mean group BF% for all equations when compared to the 3C model (2.78 to 5.18%; all p < 0.05). The standard error of estimate ranged from 4.18 (BMIDE) to 4.29% (BMIWO). Furthermore, the 95% limits of agreement were similar for all comparisons and ranged from ±7.96 (BMIGA) to 8.18% (BMIJA). CONCLUSIONS: The results of this study demonstrate that the selected BMI-based BF% equations produce fairly small SEEs and 95% limits of agreement. However, the equations also revealed systematic error and a tendency to overestimate mean group BF% when compared to the 3C model. BMI-based equations can be used as an alternative for the individual estimation of BF% in collegiate male soccer players when a more advanced 3C model is not available, but practitioners should consider adjusting for the systematic error (e.g., decrease BMIDE by 2.78%).