A Comparison of Methods for Evaluating Body Composition in Elite Female Soccer Players

Lucia Mala1, Tomas Maly2, Frantisek Zahalka3, Lee Cabell4 and Dobromir Bonacin5

1,2 Charles University in Prague, Faculty of Physical Education and Sport, Czech Republic
3 Seton Hall University, Department of Inter Professional Health Sciences and Health Administration, NJ, USA
5 University of Herzegovina, Faculty of Social Sciences Dr. M. Brkic, Medugorje, Bosnia and Herzegovina

E-mail: 1<lucilali@yahoo.de>, 2<maly@ftvs.cuni.cz>, 3<zahalka@ftvs.cuni.cz>, 4<Lee.Cabell@shu.edu>, 5<dobromir.bonacin@st.ht.hr>

KEYWORDS Validity, Fat Mass, Female Athletes, Football, Testing, Nutrition

ABSTRACT The aim of the research was to determine an accuracy of measurement based on intra-trial concurrent and convergent validity of body composition (BC). Measurements were obtained via bioelectrical impedance analysis (BIA) in comparison with the hydrodensitometry (HD) method in elite female soccer players (n = 14). BC was measured using three methods: bioelectrical impedance methods BIA 2000M and In Body 3.0, and HD. The fat mass (FM) measured by HD was 16.96±3.86 percent, whereas it was 21.26±5.77 percent when measured with BIA 2000M, and was even higher when measured by the In Body 3.0 device at 23.33±3.52 percent. Effect size between BIA and HD was >0.87, convergent validity was lower than r<0.65, coefficient of determination was lower than R²<0.65, and a standard error of estimation was higher than >2.8. The results of the research showed that, without proper prediction equations for the specific population, the selected bioelectrical impedance analysers cannot be considered valid enough to assess the fat mass of elite female soccer players.