

Agreement between standard body composition methods to estimate percentage of body fat in young male athletes

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Purpose: To examine the intermethods agreement of dual-energy X-ray absorptiometry (DXA) and foot-to-foot bioelectrical impedance analysis (BIA) to assess the percentage of body fat (%BF) in young male athletes using air-displacement plethysmography (ADP) as the reference method.

Methods: Standard measurement protocols were carried out in 104 athletes (40 swimmers, 37 footballers, and 27 cyclists, aged 12-14 y). **Results:** Age-adjusted %BF ADP and %BF BIA were significantly higher in swimmers than footballers. ADP correlates better with DXA than with BIA ($r = .84$ vs $r = .60$, $P < .001$). %BF was lower when measured by DXA and BIA than ADP ($P < .001$), and the bias was higher when comparing ADP versus BIA than ADP versus DXA. The intraclass correlation coefficients between DXA and ADP showed a good to excellent agreement ($r = .67-.79$), though it was poor when BIA was compared with ADP ($r = .26-.49$). The ranges of agreement were wider when comparing BIA with ADP than DXA with ADP. **Conclusion:** DXA and BIA seem to underestimate %BF in young male athletes compared with ADP. Furthermore, the bias significantly increases with %BF in the BIA measurements. At the individual level, BIA and DXA do not seem to predict % BF precisely compared with ADP in young athletic populations. © 2018 Human Kinetics,

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