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Agreement Of The Body Fat Percentage Evaluated By Ultrasound, Bioelectrical Impedance And Dxa In Brazilian Adults

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Abstract:

Body composition evaluation is used in different hypotheses to measure the body fat percentage (%BF). Dual-energy X-ray absorptiometry (DXA) is the gold standard method, but it is not affordable and portable. As an alternative, bioelectrical impedance (BIA) scales to be easier to use. Another portable and easy-to-use system is the Bodymetrix (BM) (Intelamatrix®, CA, USA) which uses ultrasound (US) to assess body composition.

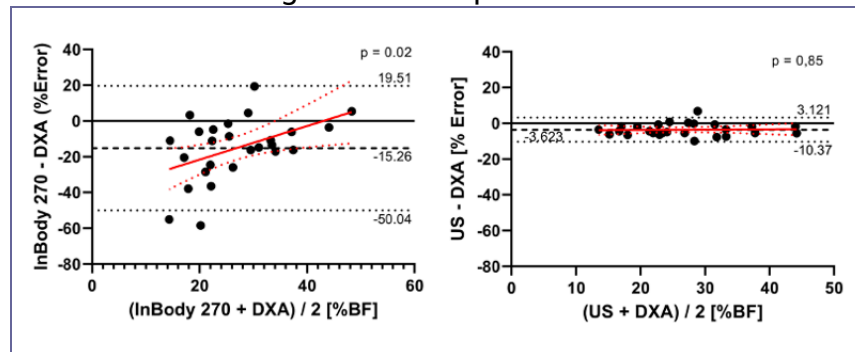
PURPOSE: To evaluate the agreement between BIA, US, and DXA methods for the quantification of %BF in a Brazilian sample of adults.

METHODS: The %BF was calculated on 28 adults (14 women, 14 men, mean BMI 26.1 ± 5.5 kg/m², with no differences between men and women, $P=0.615$). In the US analysis with BM system, Jackson and Pollock 7 sites equation was used. BIA (InBody® 270) was also performed on volunteers, with all the prior preparation required by the method. A DXA (GE®, Madison, USA) was also used as a reference to measure %BF in the same volunteers. The Bland e Altman (1986) statistical method was used to determine the agreement between methods.

RESULTS: Analysis using the Bland and Altman method and linear regression showed an

agreement between US and DXA ($P=0.85$), but not between BIA and DXA ($P=0.02$). The BIA also showed proportion bias in the linear regression. Figure 1 shows the Bland and Altman plots. The BIAS and the confidence interval are represented in the Figure 1 by dotted lines. Regression analysis between US and DXA showed a significant correlation ($r=0.890$, $P<0.001$) with an SEE of $\pm 4.63\%$ BF.

CONCLUSIONS: Ultrasound has good agreement with DXA and can be used in an adult population with a %BF range between 15 and 47%. Data obtained from a limited number of subjects ($n = 28$) showed good agreement and the US underestimates by 3.62% on average when compared to DXA.



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