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ORAL PRESENTATION – O41

ANTHROPOMETRIC RATHER THAN ETHNIC DIFFERENCES IN RAW BIOELECTRICAL IMPEDANCE VALUES

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Background: Body composition describes the quantity and distribution of body compartments and is central to the study of human variability and health status. Bioelectrical impedance analysis (BIA) is a widely used method for assessing body composition. Impedance measurements can be converted into estimates of body compartments using population-specific regression equations or analysed directly as raw data. Given the variability in body composition across human populations, literature claims that evaluation methods and comparisons should be population-specific. This reasoning applies to regression equations, whereas for raw data we hypothesise that observed differences among individuals are probably better explained by anthropometric variability than ethnicity.

Objective: The aim of this study was to analyse the impact of anthropometric dimensions and ethnicity on impedance values in the evaluation of body composition.

Subjects and methods: The analysis included 1,533 adults of both sexes from the NHANES. Anthropometric (weight, stature, and body circumferences), bioelectrical impedance (resistance, R, and reactance, Xc), and dual-energy X-ray absorptiometry (fat mass percentage, FM%) variables were considered.

Several linear regression models were compared to predict FM% variability, considering the effect of sex: 1) raw R and Xc values; 2) R and Xc adjusted for ethnicity; 3) adjusted for stature; 4) adjusted for stature and cross-sectional area; 5) adjusted for stature, cross-sectional area, and ethnicity. The relative probability of each model was evaluated using the Bayes Factor (BF), which updates prior models probability (1/5 each) to posterior probabilities, given the available sample.

Results: The model adjusted for stature and cross-sectional area excluding ethnicity (model 4) was largely the most probable (BF=10250 against models 1, 2 and 3), and BF=1010 against the model including ethnicity (model 5). In conclusion, within the examined sample, the variability in body composition between ethnic groups is explained by anthropometric variability alone.

Keywords: Human populations; Anthropometry; Body composition; Bioelectrical impedance analysis.