Author's response to reviews

Title: A Body Shape Index and Body Roundness Index: Two new body indices to identify diabetes mellitus among rural populations in northeast China

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Background: The Body Mass Index (BMI) has long been used as an anthropometric measurement. While waist circumference (WC) and waist-to-height ratio (WHtR) have been proposed as alternatives to BMI, their abilities to discern between fat and lean mass have not been evaluated. Recently, two new anthropometric indices, the A Body Shape Index (ABSI) and Body Roundness Index (BRI) have been developed as possible improved alternatives to BMI and WC.

Methods and Results: This cross-sectional study was conducted in the rural areas of northeast China from January 2012 to August 2013, and the final analysis included data obtained from 5253 men and 6092 women. ABSI, BMI, BRI and waist-to-height ratio (WHtR) were calculated according to their respective formulas. A linear regression analysis showed that the highest correlations with fasting plasma glucose (FPG) were shown by ABSI in men and WC in women. ABSI showed the lowest AUCs for DM in both sexes, while BRI had high AUCs for DM that nearly equaled those of WC and WHtR. A multivariate logistic regression analysis showed that ABSI had the lowest predictive power for DM in both sexes, while BRI was a better predictor.

Conclusions: Our results showed neither ABSI nor BRI were superior to BMI, WC, or WHtR for predicting the presence of diabetes mellitus. ABSI showed the weakest predictive ability, while BRI showed potential for use as an alternative obesity measure in assessment of diabetes mellitus.