Reviewer's report

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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Reviewer: Nir Y. Krakauer

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This is an interesting large study examining the association of different anthropometric indices with incident diabetes in a rural Chinese population. It looks to be worthy of publication, but needs to provide more information and clarify some of the discussion perspectives, as detailed below.

It is important to state how many participants actually had diabetes (and, of those, how many met the FPG criterion vs. being treated for diabetes). It would be helpful to have another table similar to Table 1 that would compare the average characteristics of diabetics vs. nondiabetics.

"Because this study had a large sample size, we assumed that our data had a normal distribution" -- Large sample size does not imply a normal distribution. Variables such as BMI, which are always positive, are more likely to be lognormally distributed, for example. The analysis methods should allow for this.

The analysis found that "FPG was most highly correlated with ABSI in men and WC in women. Compared to other anthropometric indices, BMI showed the lowest correlation with FPG in both sexes." However, Table 3 and Table 4 shows that WHtR showed the highest AUC and odds ratio for diabetes whereas ABSI showed the lowest, though judging by the confidence intervals in Table 4 the differences may not be statistically significant. The authors should discuss why there is a difference in the rankings of the correlation of the anthropometric measures with diabetes occurrence depending on the method used -- is it likely to be due to ABSI being more linearly associated with diabetes, for example, while the association with WHtR is nonlinear?

Also, it is surprising that the odds ratios for WHtR and BRI are different (Table 4), since the formula shows BRI to be simply a monotone transformation of WHtR, so everyone in the top quartile of BRI should also be in the top quartile of WHtR.

"In our study, most individuals classified as obese by their BMI, could be classified as normal if evaluated by their ABSI." This is actually expected, as ABSI was defined so to be statistically independent of BMI. See, e.g., Table 2 of Krakauer, N. Y. & Krakauer, J. C. (2014) Expansion of waist circumference in medical literature: Potential clinical application of a body shape index, Journal of Obesity and Weight Loss Therapy, 4: 216, doi: 10.4172/2165-7904.1000216, which shows that the distribution of ABSI is essentially the same across BMI categories.
"Furthermore, these discrepant results suggest that ABSI should be modified to make it more suitable for different populations." Not necessarily. What the authors can do to substantiate this is to actually check if the scaling of WC relative to height and weight in their sample is different from that used in the definition of ABSI.

"These discrepant results make it debatable whether the ABSI can be used as an alternative to BMI." As far as I know, nobody has asserted this -- again, ABSI was defined to be independent of ABSI and thus complementary to it, not a replacement.

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests