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

Version: 6 Date: 8 July 2015

Reviewer: Nir Y. Krakauer

Reviewer’s report:

I thank the authors for making substantial improvements to the manuscript. There are a few points that I believe still need more attention:

1) Reply to Comment 1:

Finally, as shown in the revised Table 1, there were 1182 participants suffering from diabetes (accounting for 10.4% of our participants). Additionally, there were 1088 participants meeting FPG # 7 mmol/L, and 548 participants were informed diagnosed diabetes. 451 participants were treated for diabetes, of which 94 participants were treated to goal. So, the prevalence of diabetes was 10.4%, and the awareness, treatment and control rates were 46.4%, 38.2% and 8.0% respectively among the rural populations in northeast China. The above results were not shown in this manuscript because another paper from our database entitled “Prevalence and awareness of diabetes mellitus among a rural population in China: results from Liaoning Province” has reported the related results [1].

These results need to be included in the current paper as well, as they are essential to characterizing the population you’re studying. Additionally, the Zhou et al. 2015 paper should be cited so that readers could consult it for more information.

2) Reply to Comment 2:

“The relationship between DM and ABSI, BMI, BRI#WC, and WHtR was examined using Spearman rank test”

This is probably adequate. However, since DM presence is in your analysis a binary (yes/no) variable (please confirm this), there might be other methods that are more appropriate, such as biserial and point biserial correlation. Please look into this.

3) Reply to Comment 3:

Our data analysis showed an exactly coincident results ($r = 1; P = 0.00$) using the Spearman rank test, which indicated that both body indices were closely related.
However, it seems to be that BRI is not a one-to-one transformation of the WHtR, though both formulas comprise the same parameters. If BRI and WHtR are exactly the same, it is meaningless for Thomas DM et al. [3] to develop BRI, because its formula is so complicated that it is difficult to apply clinically. Additionally, as shown in the table 3, diabetics in the every quartile of BRI were not consistent with those in the corresponding quartile of WHtR, which could be the main reason why the odds ratios for WHtR and BRI were different. And this furthermore confirms that BRI is not a one-to-one transformation of the WHtR. Disappointedly, the underlying mechanism is not clear and we look forward to more studies on this issue in the future.

Actually, if the rank correlation between the two variables is 1, all their ranks and hence quartiles *must* be the same for your sample. So if you get different results for the number of diabetics in different quartiles WHtR compared to BRI, there must be something wrong with your analysis. This cannot be deferred to future study but should be clarified before you publish.

4) Reply to Comment 4:

Thanks for the question. It’s a pity that we could not find the article entitled “Expansion of waist circumference in medical literature: Potential clinical application of a body shape index” in the Pubmed. Unfortunately, we could not have a better understanding of the relationship between ABSI and BMI. And we are honored if we could read this article one day.

Yes, you should read it. It is freely available online at http://www.omicsgroup.org/journals/expansion-of-waist-circumference-in-medical-literature-potential-clinical-application-of-a-body-shape-index or at http://ce180c.engr.ccny.cuny.edu/papers/OMICS_2014.pdf

**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