Reviewer's report

Title: Metabolic correlates of subcutaneous and visceral abdominal fat measured by ultrasonography in at risk subjects

Version: 1
Date: 3 September 2015

Reviewer: Ian J Neeland

Reviewer's report:

Major Compulsory Revisions

1. This paper focuses on the outcomes of metabolic syndrome, uric acid, and liver markers. The authors do not provide sufficient justification as to why these 3 specific outcomes were chosen in comparison with other potential outcomes. Was this a post-hoc data derived choice as to what outcomes most closely tracked with VAT and SAT?

2. The main conclusions that a specific adiposity marker such as VAT or WC predicts the outcome better than other markers is no sufficiently justified either. The only comparison here uses BIC, which if the data are examined closely, are all in the same relative range. Furthermore, these are modeled separately and the most informative method to compare their relative strengths for prediction of the outcome would be to incorporate them all into the same model and examine the Chi Square or R-squared values for each independent variable. Alternatively, standardized beta coefficients may be used to compare relative contribution to the outcome. Just using a 10 unit difference in BIC where the absolute values are in the 2000 range does not substantiate the authors conclusions in this reviewer's viewpoint. Additional metric such as the C-statistic for MS and the Hosmer Lemeshow test for model calibration would add more robust information to support their conclusions.

3. The authors state that their study population is "at-risk" and different compared with other studied population, potentially explaining divergent results. However, the authors do not describe what "at-risk" means and how this is defined. One could argue that everyone is "at-risk" for cardiometabolic disease.

4. The differential relationships between adiposity markers and outcomes among the obese vs. non-obese are not sufficiently explored. A secondary analysis stratifying by this important variable would be of interest.

5. What clinical relevance do these relationships have to determine the outcome of laboratory values and MS (which is based on laboratory values). Why would the clinician want to measure US based VAT or SAT to determine risk of having elevated uric acid or GGT when they could just as easily measure the actual laboratory values? Furthermore, this is only cross-sectional data and no statements can be made about predicting future outcomes or disease states. The relevance of this study as it pertains to biological questions vs. clinical questions should be clarified.
6. In the Supplementary data, SAT is generally (with the exception of BP and MS) not independently associated with the outcomes when VAT is included in the model. The possible reasons for this finding was not discussed in the paper.

7. In this reviewer’s opinion, Figure 1 does not contribute much important information. A more informative figure might be the iterative ROC curves for MS using known criteria with the addition or in comparison to adiposity markers.

Minor Essential Revisions:
Page 11, 1st paragraph: "In partially agreement" should be "in partial agreement with".

Discretionary Revisions:
None

1. Is the question posed by the authors new and well defined? This question is not novel since prior authors have examined the relationship between VAT and SAT and MS and biomarkers.

2. Are the methods appropriate and well described, and are sufficient details provided to replicate the work? The methods are well described and sufficient to replicate the work but the methodology requires revision and perhaps a stronger approach to substantiate the conclusions.

3. Are the data sound and well controlled? There is no control group here.

4. Do the figures appear to be genuine, i.e. without evidence of manipulation? Yes.

5. Does the manuscript adhere to the relevant standards for reporting and data deposition? Yes.

6. Are the discussion and conclusions well balanced and adequately supported by the data? As stated previously, the results do not necessarily substantiate the conclusions without further supporting evidence.

7. Do the title and abstract accurately convey what has been found? Yes

8. Is the writing acceptable? Yes

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I declare that I have no competing interests.