Reviewer's report

Title: The relationship between various measures of obesity and arterial stiffness in morbidly obese patients

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Reviewer: Tracy Baynard

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The relationship between various measures of obesity and arterial stiffness in morbidly obese patients
Nordstrand, et al.

The authors conducted study investigating the relationship between morbid obesity using several anthropometric measures and pulse wave velocity (PWV) as a marker of arterial stiffness. The authors noted sex differences for prevalence rates of comorbidities and PWV. Further, sex differences were observed for several relationships between some anthropometric measures and PWV, with women demonstrating stronger negative associations.

Major Compulsory Revisions:

Introduction:

1. 1st paragraph—I suggest re-working this paragraph. Much of this is known and the authors provide only 2 country-specific epidemiology points (US and Norway). I would try to make my point more quickly…and perhaps offer a Northern European/Scandinavian statistic etc….

2. Overall, the introduction is a bit choppy and not focused well enough. The 2nd paragraph offers little justification for studying abdominal fat and overall obesity in relation to cardiovascular disease (CVD) risk in morbidly obese individuals. What reason is there to think the relationship in this group of individuals would differ from Class I & II obese individuals? It is not sufficient enough to state “no previous study has explored”…. The authors need to work on the “So what” aspect of their rationale.

3. The paragraph on PWV also reads a bit choppy. I would suggest presenting some evidence on obesity and PWV, rather than just stating the obvious that PWV is associated with negative CVD risk. Secondly, the inclusion of augmentation index is rather awkward and comes off as a second thought.

4. Lastly, it is quite surprising that sex differences are not once mentioned in the introduction, given the actual analyses performed, results provided and discussion generated. This creates a large disjointed effect between the rationale for the study and what was actually presented. This needs to be addressed.

Methods:

1. What dictated assignment to the groups?, as this was not a randomized study.
2. How many subjects were morbidly obese based on BMI alone vs. having Class I or II obesity with a comorbidity?

3. Were all patients able to have their 12th rib and iliac crest accurately palpated, considering their level of obesity? What ‘back-up’ markers were used if this was not feasible? Reliability of waist circumference measures?? Error of these measures is significantly elevated in an obese population—even for circumference measures. Many body comp labs perform circumference measures at least twice.

4. Reliability data for PWV and AIx? This is important considering the difficulty in obtaining these measures in this population. Were attempts made at measuring peripheral PWV? If so, why is that data not included in this manuscript?

5. The authors state in their limitations that the distance measured for the PWV between the carotid and femoral artery may introduce some level of artifact, given they appeared to lay the tape measure directly on the subject for these measures. Did the authors not also take measurements in a horizontal plane, by placing the tape measure directly above their “spots” and getting a true liner measure that way? This is commonly done in this population.

6. Validity of bioelectrical impedance using the Inbody Analyzer in this type of population? Granted, DEXA is out of the question as is MRI due to their weight. Has anybody validated against hydrostatic weighing in this population?

7. Were medications controlled for—at least statistically?

8. Which data were skewed and log transformed?

Results:

1. Performing correlation analyses between BMI and in particular the WHtR would seem to violate issues of colinearity—please address/justify.

Discussion

1. Limitations & Strengths section—the authors state that they excluded non-white participants. This is not made clear in the methods section. Justify why non-whites were excluded and approximately how many were excluded for this reason?

2. Similar to the introduction, the discussion is lacking in the depth presented. The discussion for the most part is an extended “limitations” section and needs some expansion/deletion in areas. For instance, are there any physiological explanations for the sex differences? This would help provide a more sound discussion.

Minor Essential Revisions:

1. Background—2nd paragraph, last sentence. Please change “effect” to association.

2. Background---3rd paragraph—CAD does not need to be spelled out again here, it was already abbreviated in the 1st paragraph.

3. How long was the overnight fast? 10-12 h?
4. Statistical software package?

5. Delete the word “significantly” from your results section (text). Your p-values should denote the level of significance. If p-values are not there, insert them in the appropriate places.

6. Discussion—2nd paragraph—change “Afro” to “African”.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**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