Reviewer's report

Title: Volumetric analysis of central body fat accurately predicts incidence of diabetes and hypertension in adults

Version: 2 Date: 21 October 2014

Reviewer: Masaharu Kagawa

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The present study aimed to examine associations of %cBF, an index determined from multi-slice computer tomography images, and body mass index (BMI) with a number of chronic diseases obtained from a questionnaire using a data of 1,225 patients with routine CT scanning.

An attempt is unique and interesting to see if the proposed approach of CT imaging technique improves an estimation of body composition as well as to improve an association between lifestyles and nutrients, recognition of aetiology of diseases compared to a diagnosis from a standard one-slice scanning. However, the manuscript contains a numerous number of problems, which are mainly associated with a lack of detailed description, adequate references and inappropriate expressions.

Major compulsory revision:

1. Introduction did not describe actual aim and objectives of the study. What is current problem? Please revise the section.
2. p4, line 8. It is not clear why the authors utilized a four-slice CT instead of one-slice or more than four slices. What is the benefit of it? How about a radiation dosage and other risks??
3. p4, line 13. While the authors described that participants were those receiving routine CT scans, it is not clear if their participation to a four-slice CT scan as a part of their treatment or an additional scan for this study. This will influence whether participants had an extra radiation dosage. Also it is not clear how frequently they were routinely CT scanned. What are their annual exposures to radiation? Furthermore, if they are routinely CT scanned, which image of particular time point was utilized for analysis? Please clarify.
4. p4, clinical information. There are no specific criteria for hypertension and diabetes have been described. What are the definition or cut-off points of biomarkers were utilized? Please clarify with appropriate references. In addition, did authors included individuals with pace maker? While cause may differ between type of cancers, any cancers were included in the study??
5. p6, line 13. What is calcium scoring? What is the purpose of determine this score? Insufficient description was provided in the text.
6. p6, line 20. Please provide an appropriate reference for %cBF and appropriateness of its definition. In addition, while the authors described a
process to determine the percentage body tissue, no equation has been provided to calculate %cBF.

7. p9, line 9. It is not clearly describe how %cBF categories used in Figure 3 have been determined. The values appear excessively high for adult males (lowest category is < 35%) and am concerning this may be because of combining both genders in one figure. The authors should split genders and adjust the results with age and race to provide gender differences instead.

8. p9 line 16. Again, the authors did not appropriately provide a rationale for using age cut-off point of 55.

9. Table 1. Subgroups based on presence and absence of health status revealed that some were considerably small numbers (e.g. individuals with heart disease, stroke, and cancers). These appear inappropriate for a comparison and should be removed. In addition, it is not clear if “former smoker” taking current and non-smoker into account or not.

Minor essential revisions:

10. p4, line 12. Please provide accurate information of the proportion of each ethnic group.

11. p3, line 4. It is better not to use an expression “and many more” as readers are uncertain about what others exactly.

12. -p3, line 8. It is not clear how you defined “simple” or “complex” techniques. Considering knowledge and preparation, underwater weighing technique is difficult to consider as “simple” technique. Rather, DXA is much simpler in measurement process.

13. Better use p3, line 16 -18. The sentence is difficult to read. Please check the grammar.

14. p5, line 14. Please provide an appropriate reference for the Hounsfield scale.

15. p6, line 6. Not clear where the authors obtained 10 randomly selected patients.

16. p6, line 9. How %cBF was standardized? No description was provided.

17. p7, line 22. Do you mean %cBF?

18. p8, line 2. Throughout the text, the authors use BMI and body mass index. Be consistent the use of abbreviation.

19. p9, line 2. What does meal calcium score or 137.2 indicate? What is the average calcium score?

20. p9, line 4. A correlation of 0.08 is equivalent to have no correlation. Please delete an expression “slightly positively correlated”.

21. p9, line 6. Please check the grammar. Compared with what?

22. A title of Table 2 need to be revised to reflect the content of the table better.

**Level of interest:** An article of limited interest
Quality of written English: Needs some language corrections before being published

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

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