Reviewer's report

**Title:** Waist circumference and insulin resistance: a cross-sectional study of Japanese men

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**Reviewer:** Patrice Brassard

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Waist circumference and insulin resistance: a cross-sectional study of Japanese men

This study examined the relationship between waist circumference and insulin in a cohort of Japanese men as well as the optimal cutoff point for waist circumference in relation to insulin resistance estimated by HOMA-IR. The authors report a linear relationship between waist circumference and insulin resistance and suggest that 85 cm is the optimal cutoff in predicting insulin resistance in this cohort.

**Major Compulsory Revisions**

I have read with great interest this manuscript by Tabata et al. These are interesting and important data for the Japanese population. However, several issues need to be clarified and would strengthen the manuscript.

The introduction is quite short and the link between your background and the aim of the study is not straightforward. For example, the authors could include information about the metabolic syndrome in the Japanese population in order to complete the background of this study. This would be worthed before introducing the second paragraph of the introduction relating to the nature of the relationship between WC and IR.

It would be important to add a hypothesis at the end of the second paragraph of the introduction.

You should present the inclusion/exclusion criteria. As is, we do not know on which basis those people were excluded. For example, why people with thyroid disease were excluded? And so on.

Also, were the subjects in whom fasting plasma insulin or glucose was not determined and WC not measured excluded from analysis. Please clarify.

In the procedures section, you are referring to a self-administered questionnaire. Please describe briefly items from the questionnaire.

You should also provide more clinical characteristics of the study subjects in your table 1, in terms of medical history and current medication and lifestyle characteristics.
The utilization of geometrical means was not specified in the statistical section.

Your data are not discussed in light of the limitations related to your study. You should add such a section. For example, since you are studying the relationship between two estimates, would you have found similar results with the glucose clamp technique and tomography? Also, the present study was the ever largest study of men examining the relation between waist circumference and HOMA-IR. However, you have a cohort with a smaller range in age. Please comment. Etc...

In the discussion, you highlighted that "obesity, particularly visceral adiposity, has been known to be positively related to insulin resistance". Could you provide a similar analysis between BMI and insulin resistance? It could support this affirmation in a Japanese cohort. With negative BMI-related results, you could make a strong point in favor of visceral obesity vs. obesity described by BMI.

One issue about the study of insulin resistance is the fact insulin resistance based on HOMA-IR has been differently defined in studies, as you point out. Accordingly, why did you arbitrarily choose 2.00 and not used the cutoff utilized in the Japanese study you are citing? Would you have found different results?

In the last paragraph of the discussion, you are stating that "It is, however, unlikely that the study subjects differed from the general population with respect to both waist circumference and insulin resistance. Are the subjects from the present study fitter than the general population? If yes, they won't be similar in terms of insulin resistance and WC. You should nuance this section.

Minor Essential Revisions

In the introduction, in the sentence, "(...) the size of waist circumference as a measure of visceral obesity has been a matter of controversy.", I would replace measure by estimate.

In the methods section, you are referring to a nationwide program including almost the same items. What was the differences? In fact, even if it was described elsewhere, you should briefly describe it in the methods section.

In the statistical analysis section, you should add "arbitrarily" following HOMA-IR in the sentence "(...)odds ratios of elevated HOMA-IR defined as the highest (...)

In the conclusion, I would precise that "The findings lend a strong support for the Japanese criterion for abdominal obesity IN MEN in the metabolic syndrome.

**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