Reviewer's report

Title: Impact of HbA1c criterion on the definition of the metabolic syndrome: the China Health and Nutrition Survey 2009

Version: 1 Date: 19 August 2013

Reviewer: Fernando Giuffrida

Reviewer's report:

The paper by Xingxing Sun et al. attempts to compare fasting plasma glucose (FPG) and hemoglobin A1c (HbA1c) in the diagnosis of metabolic syndrome. Although the number of studied individuals is impressive and adequate to answer all the questions posed by the investigators, the main question in the paper seems to be the performance of both methods in the diagnosis of prediabetes/diabetes rather than the metabolic syndrome, since the other components are (properly) treated independently. Therefore, some specific points need to be clarified before an adequate coherence between the objectives, available data and conclusions can be reached. Point by point suggestions and questions for each section follow below:

Major compulsory revisions

Background section

1st paragraph:
-According to current literature, the utilization of MetS as a risk factor for CVD is quite different from using it as a risk factor for diabetes. Nevertheless, they are treated as the same thing in the text and only one reference is given. Besides, since some patients in this paper have diabetes, this brings us to the controversial issue of MetS in diabetic individuals. The literature should be reviewed accordingly and this section could use some rewriting.
-Glycated hemoglobin is a more form appropriated than Glycosylated
-Reference number is missing at the end of "...suggested that screening performance using HbA1c might differ according to ethnic origin."

Methods - Study population

-Why is having five MetS components an exclusion criterion?

Methods - Biochemical Measurements

-This section states that samples for FPG and HbA1c were centrifuged and tested immediately, but shortly afterwards describes that all blood samples to have been analyzed in a central laboratory in Beijing. Since the study encompasses multiple centers, the two sentences seem incompatible with each other.
This leads to another concern: have glucose samples been collected in fluoride or serum dry tubes? Pre-analytic error derived from this issue could seriously compromise the reliability of data.

Since insulin was measured by Radioimmunoassay, have the necessary corrections been applied to HOMA modeling?

Why has HOMA been calculated by the formula instead of the calculator software, since the second option is regarded as more correct by the group who has developed the model?

Methods - Statistical analysis

I'm not convinced that Kruskal-Wallis test followed by pairwise Mann-Whitney test is the most appropriate method to compare non-parametric variables in multiple groups. Maybe ANOVA and some post-hoc test of transformed variables would be more suitable.

Kappa statistics has been calculated for the agreement of FPG and HbA1c in the diagnosis of MetS. Isn't this essentially the agreement in the diagnosis of hyperglycemia?

Results - Prevalence of MetS

The second to last sentence seems incomplete "...the prevalence of HbA1c-based identification of MetS was significantly ... than that ..."

Discussion

1st paragraph

The first sentence takes us back to the question of HbA1c-based identification of MetS. Again, in the opinion of this reviewer, the paper is approaching HbA1c-based identification of hyperglycemia, since other MetS criteria are used straightforwardly.

3rd paragraph

The assertion that ethnic differences are important in the concordance of HbA1c and FPG doesn't seem adequately backed by references, since only three references from different populations are used, rather than any direct comparisons.

Reference 13 apparently says the opposite of what the text quotes.

4th paragraph

The explanation about FPG and HbA1c correlating with different aspects of the pathophysiology of type 2 diabetes at the end of this paragraph is lacking adequate references.

5th paragraph

The authors state that identification of MetS could be improved by the inclusion of some simple CVD risk factors, but these factors are already used to identify MetS.
6th paragraph
-The authors state that identification of MetS is of clinical importance regarding cardiovascular morbidity and mortality. This is not a consensus view in current literature, especially in the diabetic population, and should be discussed accordingly.

Level of interest: An article whose findings are important to those with closely related research interests

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 interests