Reviewer's report

Title: Gender differences in the association between socioeconomic status and hypertension incidence: the Korean Genome and Epidemiology Study

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Reviewer: Maria Garcia-Gil

Reviewer's report:

This is an interesting paper reporting sex differences in the association between the incidence of hypertension and socioeconomic status (SES), measured by education and household income, in Korea.

Major compulsory revisions

1. In my opinion, one of the main issues of the manuscript is related to how the role of adiposity is defined in the objective and how this analysis has been performed. It is well known that body mass index (BMI) and/or waist circumference (WC) are confounders or that they may play a role as mediators or modifiers in the relationship between SES and hypertension, in addition to the fact that this relationship could differ between men and women. On the one hand, the authors have analysed the association between SES and hypertension stratified by sex; while on the other hand, and in a different model, the association between SES and adiposity has been analysed without taking into account hypertension. It seems that adiposity, either defined as obesity (BMI) or central obesity (WC), shows different patterns according to sex and SES. Sex and SES are also related in different ways with the incidence of hypertension. Thus, I think it would be more suitable to analyse all these relationships in just one model. I suggest that the authors evaluate the association between SES and hypertension into different strata of BMI (ie: normal, overweight or obese) or WC (central obesity, yes/no) by sex. Consequently, BMI in continuous form would no longer be necessary in the model. The authors could probably show a more integrated picture of the role of adiposity as mediator in the association between SES and hypertension.

2. Some of the issues of the methods section should be clarified and better explained.

Methods section. Study participants.

2.1 Is the KoGES study representative of the Korean population?

2.2 Were participants with previous cardiovascular disease excluded from the study?

2.3 Excluding individuals with missing covariates could result in selection bias. Please, clarify if these individuals differed somehow from those who participated in the study. Could you also describe the main characteristics of those who refused participate in the follow-up?
Methods section. Data collection.
2.4 Report measurements in the second and fourth year of follow-up.
2.5 Related to the previous comment (2.4), give a clearer definition of the main outcome. Incidence of hypertension was measured in the second and fourth year but the authors probably took into consideration the cumulative incidence at the end of the study as a main outcome. If so, please, clarify.
2.6 What were the criteria for censoring participants in the follow-up? How did the authors deal with individuals with incident cardiovascular disease (CV)? Treatments for CV disease could modify blood pressure levels and, consequently, the incidence of hypertension

Methods section. Statistical analysis.
2.7 Why did the authors not adjust for baseline pressure levels? Baseline pressure levels are an important risk factor for incidence of hypertension.
2.8 Did the authors check for collinearity between BMI and WC in the logistic models?

3. Results
3.1 Could the authors give an overall measure of the incidence of hypertension and calculate its 95% confidence interval? (see comment 2.5).
3.2 In relation to the comment in point 1, I suggest that table 3 should be left out and that results should be shown taking into consideration different strata of BMI (obesity) and WC (central obesity) in both men and women in just one model.

4. Discussion
- It would be better to rethink the discussion taking into consideration the integrated approach proposed above. It would lead to a better understanding of the complex relationships between SES, adiposity and hypertension, in both men and women.
- Overall, the authors presented a discussion on the reasons for the sex-related differences between SES and hypertension. In the same way, it would be of interest to comment on the sex-related differences found depending on whether either education or income were taken into account. According the authors, what would be the best index to assess the relationship between SES and hypertension in Korea?
- Please, give some thoughts to the magnitude of the potential residual confounding of the variables not measured. The authors could also have mentioned physical exercise.
- Giving some highlights related to public health implications of these findings could be worth looking into.

Minor compulsory revisions
- Table 1. Footnote: "...Comparisons performed with one-way ANOVA...". Make sure you are consistent with the methods stated in Statistical analysis section (T-Student).
- Discussion. Third paragraph: "...economic level positively associated with hypertension..." Perhaps did you miss "in men" somewhere?

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

**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