Reviewer’s report

Title: Association between ambient particulate matter concentration and fetal growth restriction stratified by maternal employment

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Reviewer: Chenxiao Ling

Reviewer's report:

This study examined effect modification by maternal employment in the association between exposure to PM10 and PM2.5 during pre-pregnancy and pregnancy and fetal growth restriction (LBW and SGA). This study included a large representative sample and conducted proper statistical analysis. However, the exposure assessment could be improved, and the results need better interpretation.

Abstract

1. Background: please state the main objective (i.e., to examine effect modification) clearly in the background section.

2. Methods: "Individual-level" seems to be conflicting with "district-level". It may be more clear just to say "district-level".

3. Results: the sentence "Proportions were different for LBW (1.5% in employed and 1.6% in non-employed, P < 0.001) and similar for SGA (12.7% and 12.8%, P= 0.124)." is not very convincing when the differences between 1.5% and 1.6% was simply due to a "statistically significant" p-value. Please rephrase.

4. Results: again, it is not convincing to claim an association of SGA for PM10 with an OR=1.02 or OR=1.01 with a 95% lower confidence limit of 1.00.

5. Results: according to my comments above, I believe there is insufficient evidence to support the conclusion that maternal employment modifies the association.

Methods

6. Third paragraph: I suggest the authors to focus more on the biological mechanism of particulate matter potentially causing fetal growth restriction and the reason why there is effect modification. Are there any other justifications for the proposed effect modification other than misclassification of exposure?

7. Line 95: "In addition, misclassification of exposure is possibly larger than for the non-employed, …" Is there an extra "than" in the sentence?
7. Line 131: please explain why "we excluded measurements at urban 132 roadside sites located next to large and busy roads". This might result in the lack of exposure contrast leading to almost null associations.

8. Line 133: the district-level exposures with a coarse spatial resolution may also explain the lack of association, especially when the authors focused on term births with LBW and SGA. Is there any way to improve the exposure assessment first to increase the main effect of PM on fetal growth restriction before even looking at effect modification?

9. Last paragraph discussing effect modification should have its own subheading (e.g., effect modification) and moved above "statistical analysis".

Results
11. Line 188: "Proportions of both SGA and LBW were consistent between 189 employed and non-employed mothers (12.7 and 12.8% for SGA, 1.5 and 1.6% for LBW)." This is different from what the authors concluded in the abstract. Please be consistent and make the appropriate statement.

12. Table 2: It's difficult to find a difference in ORs for SGA between employed mothers and unemployed mother. They all seem to be very close to the null associations with borderline statistical significance'.

Discussion/Conclusions
13. Please update the first paragraph of discussion and conclusions according to the abovementioned comments.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.
I am able to assess the statistics

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