Reviewer’s report

Title: Gestational exposure to endocrine disrupting chemicals in relation to infant birth weight: A Bayesian analysis of the HOME Study

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Reviewer: Maribel Casas

Reviewer's report:

This paper of Woods et al examines the association between multiple endocrine disrupting chemicals exposure during pregnancy and birth weight by using bayesian hierarchical linear models in the population-based birth cohort HOME study in US. The study included around 300 mothers and the authors concluded that EDCs had null or very low influence on birth weight in comparison with the effect that social determinants have on birth weight in this population. Hereby I include my comments:

Abstract

- The authors conclude that more studies with larger sample size than the current one are needed to explore the association between PFAS and lower birth weight; however, in the introduction they say that "There is sufficient evidence that increased PFAS (especially PFOA) exposure is associated with low birth weight" and include a reference of a meta-analysis of 9 studies with more than 4000 subjects included.

Introduction

- BPA is not mentioned in the abstract although it is included in the analysis.

- This sentence confuse the reader a little bit since it seems that all are non-persistent; please rewrite: "Five important EDC classes are non-persistent compounds like phenols (e.g., bisphenol A [BPA]) and phthalates, polychlorinated biphenyls (PCBs), perfluoroalkyl substances (PFAS), polybrominated diphenyl ethers (PBDEs), and organochlorine pesticides (OCPs)."

- Start describing BPA before phthalates to always follow the same order.

- In the first paragraph of the introduction I miss an explanation why we have to be worried about EDC exposure during pregnancy (not only is because they widespread use).
- In my opinion the section of the description of the previous studies is difficult to follow. The authors do not mention BPA studies for example although the authors BPA mentioned it as the first EDC in the introduction.

- Please revise other papers assessing the association between PCBs and birth weight. I suggest the recent review of Vrijheid et al 2016 (Int J Hyg Env Health) which includes most of them.

Methods

- I am wondering if it would be possible that in order to compare the results with the Lenters' study, the authors could apply the elastic net regression analysis in their study.

- I recommend imputing the values below the LOD rather than reply them by LOD/ √2.

- Please, explain the method to select the confounders included in the analysis.

- In my opinion this sentence confuses the reader since the objective of the study is to analyze the effect of multiple EDCs and not each EDC group separately: "We did not fit a model with all 5 EDC classes simultaneously because it would make it more difficult to interpret the model regression coefficient".

- The authors should explain why they perform these 5 different groups of EDC (and also why phthalates and BPA - non-persistency should not be the main reason). There are new approaches suggesting to pool them based on the mode of action (please see Sharma et al Env Int 2016 as example).

- It would be nice to see the results stratified by sex.

Results

- This sentence confuses since before they have mentioned associations with two phthalates (MEOHP and MCPP): "There was no overall pattern for phthalates".

- Please, try to avoid these type of sentences: "Lastly, there was a range of associations between individual OCPs and birth weight".

- I do not know what the authors would like to mean in this sentence: "… and the factors mediating social disparities are poorly understood".
Discussion

- In my opinion I will not include ref 15 as a study assessing the association between PCBs and birth weight because it uses fish consumption as a proxy of PCB exposure.

- Please, include a paragraph comparing the levels of the different EDCs in the HOME study with other study populations. I think it is important to emphasize that PFAS exposure in the HOME study are particularly high in comparison to other study population and maybe this is the reason why the authors only found associations with these EDCs.

Tables

- Table 2 is cited previous to Table 2. Please, consider changing the order.

- It would be nice if Table 2 includes a column with the LOD of each pollutant.

- Numbers are confusing since Table 1 shows a sample size of 384 and Table 2 of 319. I recommend to impute missing values in covariates so then the different models will have similar sample sizes.

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