Reviewer’s report

Title: Association of urinary concentrations of early pregnancy phthalate metabolites and bisphenol A with length of gestation

Version: 0 Date: 18 Jun 2019

Reviewer: Laura Birks

Reviewer's report:

The authors have completed an interesting analysis of urinary concentrations of phthalates and BPA in a small sample of women, pre and post implantation, to evaluate the associations of these concentrations with a very precise measure of length of gestation. This analysis is important and contributes to the existing literature regarding the possible effects of exposure to these chemicals before and during pregnancy. The methods appear thorough and sound. Results are clearly stated, but could be improved a bit. The justification for this analysis could also be improved. It seems the authors have already done a very similar analysis (reference 31), and could perhaps explain early on (in the introduction) why this additional analysis is necessary. Perhaps they could point to their previous results and say that an analysis involving a more precise measure of gestational length could further help understanding of the effects of these chemicals on gestation/fetal development. It would also be helpful to see a diagram in the methods section. Finally, structure of the discussion could be improved. With these small improvements, I think the manuscript would make a nice publication. I will list some specific suggestions.

Page 3, lines 72-75 "In the North Carolina Early Pregnancy Study…length of pregnancy (10)" I had a hard time understanding this sentence, had to read it over several times. Could you rephrase it?

Page 3, lines 75-76 "These findings suggest… length" Do you mean to say that early pregnancy hormonal events can have effects on gestational length? It is a bit unclear to just say "pregnancy events"

In general, the second paragraph of page 3 explains some research background about phthalates and gestational length, pregnancy hormones and gestational length, but it is missing any mention of previous research regarding BPA and gestational length. This is also where authors could improve justification of this analysis.

Page 4, Exposure assessment: this type of exposure assessment is outside my specialty, so I have had a hard time understanding how many samples were collected and how many were used for
this analysis. It would be very helpful to include a figure indicating samples collected pre-implantation, post-implantation, how many of those samples were used in this analysis, how the pools were made. I think I understand there are three Monday pre and post samples that were each pooled, per participant. But it was not easy to figure that out, the explanation could be clarified with a diagram.

Page 5, first full paragraph: "Urine specimens were analyzed…". In this paragraph, it would be better to say here that you dichotomize the exposure variables. For me, it seems out of place in the statistical analysis section.

Page 7, line 166 "However, 27 women were missing data on whether they had such …." It would be helpful if authors could indicate what % of the sample this was.

Page 8, line 191 "…we present only unadjusted estimates." You have justified here why you did not adjust for age, but what about the other confounders such as maternal education, smoking, or parity? You could provide justification for why you did not adjust for these, or you could provide your results adjusted and unadjusted for comparison.

Table 1: The table is missing units. Also, I was curious to also see the concentrations of HCG pre and post implantation. Could that be added to the table?

Table 2: In the Biomarker column, you could indicate that this is a binary variable, and not continuous concentration. If I understand the analysis correctly, I think maybe this table should be more structured like an odds ratio table, indicating that the hazard ratio 1 is for the reference category (mom's below the median), then indicating the listing the HR for mom's with concentrations above the median. It is also not clear how this HR relates to days of gestation. You explain in the text that the MEHHP concentrations correspond to a 3 day longer pregnancy, but it is not easy to understand how this calculation was made, based on the HR. Perhaps you could provide the formula? It would also be helpful in the table to provide the N for mom's above and below the median for each biomarker.

Discussion: I would have structured this discussion a bit differently. In the first paragraph, you don't yet need to mention other literature, you can just summarize the most important findings from your analysis. Second paragraph: strengths, third paragraph: limitations, then after that you can get into how your findings compare to the literature. It would also be helpful to discuss suspected biological mechanism for these findings.

Page 11, line 281-283 "This cohort of naturally… birth." This whole paragraph is not really necessary, you already say it in the strengths paragraph.
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Please indicate how interesting you found the manuscript:

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**Quality of written English**
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