Reviewer’s report

Title: Trends of blood pressure and heart rate in normal pregnancies: A systematic review and meta-analysis

Version: 0 Date: 03 May 2019

Reviewer: Nelson Wang

Reviewer's report:

This manuscript titled "trends of blood pressure and heart rate in normal pregnancies: A systematic review and meta-analysis" looks at the blood pressure and heart rates of healthy pregnant women to provide a reference range for expected physiological changes in pregnancy.

The authors should be commended for the tremendous amount of work required to undergo such a task. However, as the authors also point out, there are many severe limitations that hinder a clinician's ability to interpret these results.

There was significant statistical heterogeneity in the analyses, which not only reflects potential differences in the patient populations but also methodological differences between studies. Unfortunately, there was little data available on the patient populations, so the between study differences could not be more accurately explained. Differences in measurements of gestational age, blood pressure measurement and heart rate are also important. Even differences in the time of day, can have a large impact on blood pressure readings. If the heterogeneity was able to be explained by the patient characteristics or differences in measurements, then the results would be of more merit.

I do not think the authors should have included participants who subsequently developed gestational hypertension or pre-eclampsia because these patient's would likely have much higher blood pressure readings. It also goes against the purpose to establish a reference range for healthy women.
What is also concerning is that some studies had BP and HR trajectories in the opposite direction to the overall trend. There should be some attempt at explaining, perhaps in a table, the BP and HR trends within each study. The authors could then provide a thoughtful discussion about which of these studies would be more appropriate as a reference range.

It is interesting that there was no BP difference between nulliparous and multiparous women, but this may be secondary to the other limitations above.

When creating reference ranges, there usually needs to be some form of age adjustment, which was not possible in this study.

The authors should propose mechanisms to account for their SBP/DBP changes they observed.

Overall, I appreciate the lack of high quality evidence in this space, and the authors should be commended on their attempt at undertaking this difficult task. The paper should focus more on the individual studies, and try to bring light to those that are high quality and provide a reference range using these studies. I would also suggest a formal statistician review from the journal.
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Yes

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