**Reviewer’s report**

**Title:** Association between thyroid-stimulating hormone and maternal hemodynamics in hypertensive disorders of pregnancy: An observational study

**Version:** 0  **Date:** 02 Aug 2019

**Reviewer:** Andrea Kattah

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This is a study looking at the correlation between TSH and free T4 with maternal hemodynamics in women with gestational hypertension. It is a cross-sectional study and thus any conclusions on cause and effect need to be very cautious. There is no comparison to women without gestational hypertension, which I think is a limitation, as it is hard to know if the correlation between TSH and CO really has anything to do with gestational hypertension, or whethehr this is true of all pregnancy.

1. The authors do not say how many women had gestational hypertension versus preeclampsia. It would be useful to know what type of hypertensive disorders the women in this study had, as preeclampsia is characterized by more systemic endothelial dysfunction that gestational hypertension alone. One would expect more hemodynamic alterations in the more severely affected group and it would be good to see this added to any models (preeclampsia vs. gestational hypertension).

2. Were urinary proteins measured? Women with preeclampsia and heavy proteinuria could lose thyroid-binding globulin in the urine and develop subclinical hypothyroidism.

3. Why would cardiac output, but not cardiac index, but correlated with TSH?

4. On page 9, line 193, would not say that TSH contributes to cardiac output reduction as you have only identified a correlation, not a causation. Similarly, the first line of the discussion uses the word 'risk'. This study has only looked at associations and a cross-sectional study cannot assess risk.

5. The authors appropriately bring up the associations of thyroid disorders and growth restriction, but do not provide any data in this regard. What were the brith weights, number of low birth weight infants, etc.? Did women with low cardiac output have fetal growth restriction as hypothesized?

6. It would nice to see if this relationship between CO and TSH is true regardless of whether a woman has hypertensive pregnancy. Are there studies looking at maternal hemodynamics in relation to TSH in normal pregnancy? This would be a good control group for this study.

7. Page 12, line 261. Cannot say that you discovered that elevated TSH contributes to CO reduction in GHD without comparing to women without GHD.
8. In Table 1, the number of women with gestational diabetes seems quite high. How was this defined and is this typical of this population?

9. Would include urine protein and birthweights in Table 1 as well. What gestational age did women go on to deliver at?

10. Table 2 - explanations of the abbreviations are needed below the table.

11. Table 3 - I would suggest that authors reorganize Table 3 with the r and p values side by side, instead of on top of each other.

12. Would avoid CO disturbance and instead so reduced cardiac output, or something to that effect.

Some grammatical and English errors need to be corrected.

**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.

Yes

**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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