Reviewer's report

Title: Improvement of fetal heart rate monitoring by exclusion of maternal-fetal heart rate ambiguities in the final hour of labor.

Version: 2 Date: 6 August 2015

Reviewer: Phyllis K Stein

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Basically, this manuscript suggests that when there is signal loss in the fetus, the maternal heart rate might be confused with decelerations in the fetal heart rate and that it would be better to subtract the maternal heart rate from the signal in that situation.

This manuscript has some places in it that are totally unclear and I will list them, but my major concern is the way the tables are presented. Table 1 should contain the data presented in the first paragraph of the results section. No one should have to wade through the description of the population in text.

The actual Table 1 is not very useful and probably could be summarized or put in an appendix.

Table 2 should include the 5 cases where there was no ambiguity as a separate column. The statistical comparisons in Table 2 are of concern. For example, in mode of delivery, I do not know how you can possibly make a statistical comparison between 4 C-sections and 2. One more case in either category and the whole thing would change. Indeed with an N of 17 for the minor group, making sub-categories is statistically very tricky and there is no correction or even discussion of the potential statistical problem of multiple testing.

Table 3 does not make any sense. For example, the change in % signal loss before and after cleaning -13 (7) vs. 14 (7) cannot possibly be significant as described (p<0.001). I am guessing something was significant but this table is very confusing and need to be checked by a statistician.

Table 4 is worse. There was no change in the alarm code for the babies that were in trouble and there was for the ones that were not (p=0.021). The further analysis of the total is more than irrelevant, it is misleading and reduces confidence in the author’s understanding of what statistics are for.

The objective was clearly stated on line 69.

This was not a study of missed fetal death, but I am curious about how many interventions would be caused by misinterpretation of the FHR and how many would have been prevented. This is essentially a pilot study where there was no effect, but I would be interested in your speculation in the discussion.

Were all of the mothers in the study given Pitocin? Any? It appears that there were only two unmedicated deliveries in the dataset. Would a mother delivering naturally usually be monitored too?
The description in the methods of LTV, STV, and the color codes would make perfect sense to someone in the field but was confusing for people who do not regularly deal with this. I would suggest that at the least some terms be used without abbreviations (e.g., SL)

You describe this last hour recorded in labor but then say that some women were pushing but most were not because almost everyone has an epidural. You describe all of the babies as being in good shape at birth, based on the APGAR score but it is unclear if the c-sections were planned or emergent.

Other places where the paper was not clear:

Methods lines 94 on. The definition of STV. The definition for LTV. Please try to run this by someone who knows nothing about the topic and see if you can make it clear enough to understand.

Line 159-161 of methods. The sentence just does not hold together grammatically.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests.