Reviewer's report

Title: Direct versus indirect measurement techniques for the measurement of blood loss after delivery

Version: 2, Date: 3 February 2014

Reviewer: Cynthia Wong

Reviewer's report:

General Comments: The manuscript describes an observational study comparing two different methods of estimating blood loss after cesarean delivery. I congratulate the authors for studying an important topic, namely the estimation of blood loss after delivery. The study appears well conducted and the manuscript is well written.

Inaccurate estimation is an important contributor to maternal morbidity and mortality worldwide. However, the information Small differences in estimated blood loss (e.g., 50 mL), especially for small blood loss volumes (e.g., < 500 mL) will likely not change patient management or outcome. Only large differences (perhaps 200 - 250 mL) at large blood loss volumes are clinically significant.

The study included very few women with estimated blood losses greater than 500 mL (n = 60). The difference in the proportion of women diagnosed with PPH (which might trigger a change in management) (http://vassarstats.net/prop2_ind.html) between the two assessment techniques was 4%, but the 95% CI of this difference is 0.6% to 7.5%. Thus, I disagree with the authors' conclusion that "there is an important difference in recorded blood loss between the direct and indirect measurement methods..." In fact, I think the authors could argue the opposite, namely that the small difference in estimated blood loss volumes between the two techniques make either technique acceptable for estimated blood loss after delivery. Finally, most, if not all research studies that use blood loss as a primary outcome will use the same method to estimated blood loss in both the treatment and control groups; thus it is immaterial which method is used.

Major Essential Revision:

1. Title: The title should reflect the study design
2. P2, background and top of P4: Please articulate the study hypothesis.
3. P2, methods: please provide more details about the study group (women undergoing vaginal delivery).
4. P2, result and P9L1-3: please report the difference in mean estimated blood loss between the two groups and the 95% CI of the difference. I suggest that a mean difference of 50 mL is not clinically significant. Given there is no gold standard, we do not know which technique is more accurate.
5. P2, conclusions: Please see General Comments above.
6. P5L7: How was the randomization performed (e.g., computer generated random number table)? How was the allocation concealed? When did the provider learn of the allocation group? Was the person collecting the other data blinded to group assignment?

7. P6L16-17: How were blood-soaked gauze sponges accounted for in the direct group?

8. P6L19: Do the authors mean that the weight of the dry weight of the gauzes and mops were subtracted? How was the dry weight determined?

9. P7L16: Were the data normally distributed? I think this is unlikely; the SDs of the primary outcome, estimated blood loss, are almost as large or larger than the means. Therefore, parametric statistics are likely not appropriate.

10. Figure 2 and Table 3: The data reported in the figure and tables duplicate one another. Please pick on method of reporting the data and delete the other. Additionally, I do not think reporting the results in this manner are important to the study result unless the authors wish to determine if there are differences in the two techniques at low, but not high volumes, or vice versa. In this case, they should perform the statistical analysis to show this is the case, or not.

11. The authors describe hemoglobin measurement in the Results section, but do not report have results.

12. Discussion: The Discussion is quite long relative to the new information presented in the article. As stated above, I do not agree with the authors’ conclusions that the difference they found in the techniques is clinically important (see General Comments), or even important to research studies as long as the same technique is used for all groups compared in a study.

13. Table 1: Please rounds age to whole numbers (fractions of a year are not important). Gravidity and parity should be reported as whole numbers (not continuous data—women cannot have a parity of 1.5) and reported as median and range. One or more complications: the number seems very low.

14. Table 3: These values are not independent of one another. The whole distribution should be compared between groups, not each individual ranges. Thus, there should be one 2 x 6 table, not 6-5 x 2 tables.

Minor Essential Revisions
1. P7L12: I am not familiar with the term “harmonic standard deviation.”
2. P8L12-14: These data are reported in the table and do not need to be reported in the text.
3. P9L1 and abstract: Please round values to whole numbers. Fractions of mL cannot be estimated accurately.

Discretionary Revisions:
1. P3L2-4: Actually, I would argue that accurate assessment of blood loss is vital for taking care of the patient who is bleeding.

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

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.