Reviewer's report

Title: Cesarean section: The importance of telling the woman's story for effective clinical audit. Findings from a multi-center record review study.

Version: 2 Date: 22 July 2013

Reviewer: Nanna Maaløe

Reviewer's report:

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Dear Janelyn Ann Cruz and Thomas van den Akker

Thanks for considering me to review the manuscript “Cesarean section: The importance of telling the woman's story for effective clinical audit - findings from a multi-center record review study”.

I find the study to be a coherent and sound addition to scientific knowledge, revealing some important quality issues that are widespread in developing countries. It is an interesting multi-country criterion-based audit of cesarean section cases including findings on suboptimal maternal and fetal monitoring during labor, severely poor record keeping of key assessments, alarming diversity among study sites in when to perform (emergency) cesarean sections and due to which medical indications, and what seems to be unnecessary high rates of poor maternal and fetal outcomes. While there are reports on audits on various aspects of maternal care, there are still few reports similar to this, and to my knowledge there are none that are this big with nearly 3000 cases.

Please see my suggestions for revisions below.

Compulsory and Essential Revisions

Background:

1. Another reference should be applied for “CS also exposes women to an increased risk of complications and perinatal mortality in subsequent pregnancies”. Souza et al. only considered outcomes (maternal and perinatal) up to hospital discharge of the current pregnancy.

Methods:

2. More details should be given on how the study sites were “purposively selected”.

3. It is described how the two-person research consultant teams interviewed key informants. However, these interviews are not mentioned in the result section of the manuscript. It should be clearer whether the interviews are a part of this paper. Also, it is unclear whether it is the consultants who collected the retrospective data.

4. The description on how the AMDD module 8 questions on primary indications
was “substantially modified” and on the collapsing of indications into 18 groups according to Stanton et al.’s proposed classification (reference 19) is unclear. The authors may consider a diagram/figure to explain this.

While Stanton et al. recommend division of indications into absolute maternal indications and non-absolute indications, table 4 is divided into maternal and fetal indications. The reasons for this should be explained. Please also see the questions to table 4 below (9.).

5. The definitions of when to classify the indication as ‘other’ and ‘data missing’ are overlapping?

Results:

6. ‘Type of CS: emergency or non-emergency’
- How are emergency and non-emergency cesarean sections defined in this study?

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7. ‘Use of the partograph’:
- How did the authors define incorrect completeness of partographs?
- According to WHO, a crossed action line does not necessarily indicate “the need for emergency surgical intervention”, but indicates that obstetric action should be taken. Importantly, less invasive procedures such as artificial rupture of membranes, oxytocin, or assisted vaginal delivery should be considered - if applicable - prior to surgery.

8. ‘Timing of care’
- The time interval from admission to delivery as a proxy measure for decision-to-delivery interval seems irrelevant. For instance, if a woman was admitted early in labor and developed a poor fetal heart rate at 9 cm of cervical dilation leading to an emergency cesarean section, a long interval is acceptable and shows good quality of labor management.

9. ‘Table 4: Primary indications for all cesarean sections by hospital’:
- The list of indications is a little confusing. Consider emphasizing (by e.g. bold typing) the main groups of indications applied, which currently is ‘maternal indications’ and ‘fetal indications’. Alternatively, consider dividing into groups of absolute and relative indications as well as – if applicable – cesarean sections without medical indication.
- How do the authors distinguish between ‘obstructed labor’, ‘failure to progress’ and ‘cephalopelvic disproportion’? It seems that there is disagreement internationally in the use of these terms, and it might be argued that cephalopelvic disproportion and obstructed labor are diagnosed only when a trial of labor shows failure to progress (unless there is a grossly abnormal pelvis or obvious fetal hydrocephalus). The authors may consider whether all of these indications should be considered as “failure to progress / prolonged labor”?
- Also, the indications ‘maternal medical disease’ and ‘pre-eclampsia / eclampsia’
seem overlapping?
- What is the definition of ‘precious pregnancy’ as indication for cesarean section?

10. ‘Table 6: Fetal and maternal labor outcomes by site’:
- What does “Experienced complications” include?
- The “Birth outcomes” are unclear. E.g. consider rephrasing “No. of fetal deaths” to “No. of perinatal deaths”, and “Dead” to “Stillbirths”.

Discussion:
11. In general:
- In the background section, the authors write: “This paper explores the relationship between the quality of data found in obstetric records and the quality of decision making and how this relationship impacts the quality of care for CS.” Please make this clearer in the discussion.

12. ‘Improving the quality of labor monitoring – use of the partograph’:
- Are the authors a little too certain in their conclusion regarding obstructed labor and uterine ruptures as being correlated to pre-hospital delays?

Some studies from resource poor settings report a high number of these complications to arise after admittance due to suboptimal surveillance at the labor wards. Information on labor progress at the time of admittance for these cases would be interesting. Alternatively, in cases

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where uterine rupture or obstructed labor was the indication for cesarean section, the time interval from admission to delivery might be seen as a proxy indicator of whether the complication was due to pre- or intra-hospital delay.

Conclusion:
13. This needs a rewrite. It should clearly conclude on the objectives mentioned in the background section, which were “to assess the overall quality of cesarean section recordkeeping and data management, and to assess the quality of care in cesarean section services to identify areas for quality improvement”.

In the conclusion (as well as the title), it seems that the focus on poor record keeping outweighs concluding on the suboptimal quality of care found.

The manuscript in general:
14. The paper is unnecessarily long. The authors need to make the presentation more concise and shorten the overall length of the article (especially the sections on background and discussion).

Discretionary Revisions

Results:
15. ‘Characteristics of the women’:
- Consider ‘referrals’ as a paragraph heading after ‘characteristics of the women’.
- Do the authors have information on how far in labor (e.g. latent phase, or first/second stage of active labor) the women were when referred?

16. ‘Key aspects of surgery and care’:

- Consider changing the heading. The manuscript does not report key aspects of the surgery, but of care and decision making on cesarean section.

17. ‘Indications for CS’:

- The study reports a very big number of cesarean sections performed due to clinical signs of uterine rupture. Do the authors have information from the operation descriptions on whether there was an actual rupture? And as mentioned above (12.), do the authors have information on whether the ruptures occurred pre- or intra-hospital?

18. ‘Maternal outcomes’:

- The study reports a high rate of maternal deaths (46 deaths in 2941 cases). Do the authors have information on the causes of these deaths and when they occurred (intra- or post-partum)?

19. ‘Fetal outcomes’:

- Regarding the high rates of perinatal deaths, it would be interesting to know when during labor the women were admitted (latent phase, first/second stage of active phase), and if there were positive fetal heart rate found at the time of admission?

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- Also, have the authors looked at how many cesarean sections were performed on intra-uterine fetal deaths? If known to be stillbirths at decision to deliver, a vaginal delivery (including destructive delivery if necessary) should be aimed for.

Discussion:

20. ‘Improving the quality of record keeping’:

- The authors write that “no standard format or terminology was used for patient files or documentation”. What about the partograph?

21. ‘Improving the quality of labor monitoring – use of the partograph”

- The authors may consider including this section under the sub-heading on improving the quality of record keeping. The partograph is a kind of record keeping and record keeping is correlated to the quality of labor monitoring (at least if labor monitoring is recorded prospectively).

22. ‘Reducing the decision-to-delivery interval

- The authors may consider including the decision-to-delivery interval of 45 minutes, which is suggested by RCOG and might me more feasible in resource poor settings.

23. ‘Cesarean section indications’

- The authors may consider phrasing all sub-headings in the discussion as recommendations to improve quality of care (as the previous sub-headings).
With the data available, would it be possible for the authors to estimate how many of the cesarean sections that were performed unnecessarily at the time, when considering the indication mentioned and/or the preceding labour management (e.g. artificial rupture of membranes and assisted vaginal delivery)?

24. ‘Improving access to delivery at health facilities’

- This was not a part of the current study and should shortly be included in the paragraph below on ‘limitations’.

Limitations:

25. The authors write: “Despite its limitations, we believe the institutional CS rate to be a useful descriptive indicator that sheds light on the volume that a site is managing and on the site’s place in the broader health care system”. This seems contradicting to the findings of the study showing great differences in hospital-based cesarean section rates, which do not seem to be correlated to workload (when considering table 1), and diversity in the indications used for when to decide on cesarean section. When analyzing the findings of this and other studies on the quality of care preceding cesarean sections, it may be suggested that there is a tendency in low resourced settings to perform cesarean sections without clear medical indications when other less invasive interventions have not yet been considered, and conversely, that some women in need of the procedure do not receive it. Hence, it may be concluded that without assuring that the quality of the decision process is acceptable, increasing hospital-based CS rates are not a proxy indicator of improved emergency obstetric care or of “the volume that a site is managing”.

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Minor issues not for publication

26. In the background section, the sentence “the risk of severe adverse maternal and perinatal outcomes is increased when cesarean section (CS) is performed without medical indication” is unclear. The risk is higher than for vaginal birth, but not higher than for cesarean sections performed due to evidence-based medical indications.

27. In the background section, the sentence “…in Latin America and South Asia and some low-income countries…” is unclear.

28. The abbreviation ‘FC’ is not used continuously.

29. “About one-third of the women referred in Mali came with a partograph, as did more? than 10% from Niger B”

30. Underlining of headings is inconsistent.

31. Please rephrase “…or a the model developed at large maternity in Bangladesh”.

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.