Reviewer's report

Title: Screening for inter-hospital differences in cesarean section rates in low-risk deliveries using administrative data. Can it contribute to quality of care initiatives?

Version: 2 Date: 13 April 2007

Reviewer: K.S. Joseph

Reviewer's report:

General

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

Summary

The authors discuss the issue of cesarean delivery rates in the population and propose to use hospital rates of cesarean delivery for the purposes of quality improvement in health services. Towards this end they propose to:

1. carry out analyses to “....document..... the existence of both clinical and statistically significant inter-hospital differences in CSRs (Cesarean Section Rates) among low risk deliveries.”
2. “hypothesize that hospitals with a high CSR would not experience better neonatal outcomes”.

The study elaborates a methodology for identifying hospitals with high, average and low CSRs and graphically demonstrates the findings with regard to the experience of hospitals in Belgium between 2001 and 2004. In the second part of the study, neonatal outcomes are examined and it is observed that low and very low Apgar rates are less frequent in the high CSR hospitals. Respiratory outcomes are also examined. Adjustment is carried out for gender, age, and time period and contrasts between high CSR, average CSR and low CSR hospitals for 1 minute Apgar scores show that very low Apgar scores are significantly less frequent in the high CSR hospitals compared to the average CSR hospitals and significantly less frequent in average CSR hospitals compared with low CSR hospitals. The authors conclude that there is ‘overuse’ of cesarean delivery in high CSR hospitals as one would expect to see more cases of very low Apgar scores if the cesarean deliveries were in fact medically indicated. The low CSR hospitals are identified as not providing sufficient cesarean deliveries as outcomes there were worse than in average CSR hospitals.

Comments

1. The first part of the study, related to identifying hospitals with high, average and low rates of cesarean delivery appears straightforward. The second part of the study, especially the apparent disconnection between the hypothesis, the findings and the interpretation, is less clear. As mentioned, the authors hypothesized that “hospitals with a high CSR would not experience better neonatal outcomes” (page 4). However, when they did find that the frequency of very low Apgar scores was lower in high CSR hospitals they made the rather convoluted argument that one would expect to see worse outcomes in high CSR hospitals if the cesarean deliveries had been medically indicated. Note also that the higher frequency of very low Apgar scores in the low CSR hospitals are interpreted in a straightforward manner - very low Apgar scores in this context are taken to indicate poor neonatal outcomes and deemed to be due an underuse of cesarean delivery.

2. The authors’ attempt to identify high CSR, average CSR and low CSR hospitals and to provide feedback to individual hospitals is a laudable attempt to improve quality and the data used appears appropriate for the purpose. However, the attempt to quantify quality of care and obtain an estimate of cesarean delivery ‘overuse’ probably requires a study that is based on more detailed clinical information than what may be obtained using administrative databases and ICD codes.

3. Analyses of neonatal outcomes are all stratified by route of delivery. It may be preferable to examine the overall experience (irrespective route of delivery) first. Ultimately, the issue is whether all women delivering
in the hospital are being appropriately served. Stratification by route of delivery may be helpful as a second step in explaining findings etc but may complicate/obscure the overall picture (especially given that rates of cesarean delivery are different in the 3 groups).

4. On page 7, lines 11-13, the authors state that a departure of 5% above or below the national trend was deemed to be important. On page 12, lines 9-10, they state that trend departures “...ranged from -6% to +6% and no outlying hospitals were encountered. This needs clarification. First, it is unclear what they mean by outlying hospitals. Do they mean no hospitals had a trend that constituted an “important” departure from the national trend? Figure 2 does show to at least 5 such hospitals. Also, there appears to be at least 1 hospital which had a departure in trends that was greater than -6% (Figure 2).

5. There is little discussion regarding two of the most substantive findings in the manuscript. First, there is an enormous difference between high CSR hospitals, average CSR hospitals and low CSR hospitals in terms of the rate of Transfer to a specialized perinatal service (it is unclear if this refers to the mother or infant or both). The differences in the transfer rates suggest that the larger (tertiary) hospitals are falling into the high CSR category (i.e., no need to transfer). If this is the case, it could also be that the patients in the high CSR centres are also relatively ‘high risk’ compared with those in the low and average CSR hospitals. Neither the administrative data used nor the ICD-9 coding of the data provide assurance that all suspected risk factors were eliminated from the group identified as low risk. A relative higher cesarean rate in the group excluded does not provide complete assurance that all cases with known risk factors were excluded.

The other significant finding is the 2 fold variation in cesarean delivery rates by weekday. This would appear to be an issue worth clarifying. Is this because of inductions being scheduled in the early part of the week or because obstetricians are unavailable on certain days of the week?

6. There is a need to clarify the term ‘elective cesarean’ i.e., to distinguish between cesarean delivery that is carried out before the onset of labour and cesarean delivery carried out without any medical indication.

7. The manuscript needs to be substantially edited. English does not appear to be the authors’ first language. Although the meaning is mostly clear, there are several instances where one has to deduce the meaning through context or reference to other sections of the manuscript because of ambiguity in wording. A second issue deals with manuscript organization. Although I understand that BioMedCentral Journals do not place a restriction of manuscript size, an attempt at making the manuscript more reader friendly would be appreciated. This could be done by relegating all extraneous material to an Appendix (to which interested readers can refer).

8. The inconsistent use of commas and periods for the decimal point is confusing and should be corrected both in the text and in the Tables.

9. There appear to be several typographical errors with regard to the numbers in Table 4.
   591 cesarean deliveries among women aged 20-24
   428 cesarean deliveries in January
   404 in November
   956 on Monday
   878 on Wednesday
   4557 with Apgar >6
   etc

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Page 14 bottom and page 15 top
This speculation regarding the expectations of the low Apgar belongs in the Discussion section.

Page 6, lines 1-4 from the bottom.
These sentences need to be reworded. It is not clear what populations are being alluded to (when the authors refer to study and control populations).

Page 6, line 11
IUGR is equated with birth weight <2500 g. A birth weight <2500 g is more appropriately labelled “low birth weight”.
Apgar is categorized as “very low”, “low” and “good”. These words do not represent points on the same continuum. A scale can go from low to medium to high or from poor to fair to good to excellent but not from low to good.

It is sufficient to provide non-significant p values correct up to the second decimal place.

The definitions of the P values provided in the footnotes to Table 2 and Table 3 are not exactly correct (it is the probability of observing rates/odds ratios such as these assuming the null hypothesis of no difference is true). They are also perhaps unnecessary.

The current Table 3 should precede the current Table 4 i.e., provide cesarean rates, which are easier to understand, before odds ratios.

Discretionary Revisions (which the author can choose to ignore)

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

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

Quality of written English: Not suitable for publication unless extensively edited

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

Declaration of competing interests:

I declare that I have no competing interests