Author’s response to reviews

Title: Effect of team training and monitoring on the rate of failed mid and low cavity vacuum extraction: a hospital based intervention study

Authors:

Kristina Pettersson (kristina.a.pettersson@sll.se)
Magnus Westgren (magnus.westgren@ki.se)
Rebecca Götze-Eriksson (rebecca.gotze-eriksson@sll.se)
Gunilla Ajne (gunilla.ajne@sll.se)

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Author’s response to reviews:

Rev 1

Rev 1: The present study aimed to observe measurable effects on the safety of vacuum extraction deliveries when introducing team training and increased monitoring aimed at vacuum extraction between three different periods. The main finding is the decreased frequency of failed extractions after introduction of clinical team training, and a decreased risk of complicated extraction at the additional introduction of monitoring through traction force measurement. The paper is easy to read with a clear description of the results.

Nevertheless, several data are missing to enhance quality of the paper:

Reply: Please specify what data are requested here, if the editor finds it important to explain why we have not presented the data that might have enhanced the quality of the paper. If this note refers to the comments immediately below, please see reply

Rev 1: I don't understand the following indication for one assisted delivery (fetal distress or dystocia, where dystocia included maternal fatigue and prophylactic; large for gestational age 4500g) Is Large for gestational age an indication for assisted delivery? Does the team used a tool
to predict fetal macrosomia during labor? - Please define more precisely fetal dystocia … does it mean lack of progress? –

Reply: This comment I believe represents a misunderstanding due to a careless mistake on my behalf. In the original manuscript row 151 an ending parenthesis is missing after the word “prophylactic” to denote the end of a specification of the indication variable. Large for gestational age is therefore not an indication subtype, and furthermore we did not intend to claim that there is such a thing as “fetal dystocia”, but rather “fetal distress” or “dystocia”. The item has been corrected and rephrased for clarity. See page 6, row 159 in revised manuscript

Rev 1: Please give precisions about types of metallic vacuum which were used in the study

Reply: A description has been added in the methods section, page 4, row 117.

Rev 1: - The program of training is not described enough: Was a simulator used? Who was the teacher? Was the video used during training sessions with feedback? –

Reply: The description of the training program has been elaborated accordingly, see page 5, rows 136-138

Rev 1: In the period 2, there was introduction of an electronic extraction handle which objectively measures and records the magnitude and duration of traction force employed in metal cup extractions. It could be interesting to remember in this paper why the authors think that monitoring traction could be beneficial to reduce failed extractions

Reply: We did not specify any direction of effect on the failure rate after traction force measurement, as stated on page 4, row 101.
Rev 2

Reply: Reviewer 2 recommends additional statistical review. Please specify, if deemed necessary by the editor.

Rev 2: This is an interesting paper assessing three periods of VE after institutional training implementation. Since the main intervention/exposure is the structured measure to reduce failed VE, I strongly recommend including these interventions in a table or a figure in methods section and not leaving them in a supplementary file.

Reply: We have added a timeline figure illustrating the exposure periods and including a specification list of the training. See figure 1 legend page 5, row 142

Rev 2: A few questions to the authors: 1. How did you come up with the sample size of 1074? was there a power calculation? or did you include all patients undergoing vacuum during that time that met inclusion criteria? It would be helpful to see power calculation

Reply: Yes, we included all patients undergoing vacuum extraction who met the inclusion criteria. No, there was no power calculation

Rev 2: 2. Please explain/speculate why the adjusted RR for failed extraction was non significant in period 0 versus 2. Did the training effect fade out? If so, this is very discouraging that the improvement happened only for a short time and takes away from the impact of this intervention. If anything, the authors state that complicated extractions decreased in that period, so this should lead to higher success rates for vacuums.

Reply: A comment on this has been added in the interpretation section in the discussion chapter, pages 11-12, rows 264-271.

Rev 2: 3. Also, please clarify, did the training happen in the year 2009-2010, prior to period 1, or was period 1 a period of active training? This was unclear from introduction and methods 4.
Reply: The training began during 2009, but it was not until 2011 that all staff members had participated in the sessions. The training is recurring annually from 2009, with the ambition to cover all staff members every two years.

Rev 2: Please describe suction cups used for all extractions- was it always a metal cup?

Reply: The type of cup was not included as a variable in this study, since we know from our previous data that metal cup (Bird size 50 mm) is used in nearly all cases of non-outlet extractions at the clinic.

Rev 2: Was there a shift in type of vacuum used over the study period?

Reply: During the traction force measurement period, doctors were recommended to choose metal cup at all instances in order to include all extractions in the measurements. This may have influenced the plastic/metal ratio in outlet extractions, but it is not likely to have influenced the mid and low extractions, since those were already carried out with metal cup in nearly all instances.