Author's response to reviews

Title: Poor adherence to neonatal resuscitation guidelines exposed using camera surveillance at a tertiary hospital in Nepal.

Authors:

Caroline Lindbäck (carolinelindback@hotmail.com)
Ashish KC (aaashis7@yahoo.com)
Johan Wrammert (johan.wrammert@kbh.uu.se)
Ravi Vitrakoti (ravikpi@gmail.com)
Uwe Ewald (uwe.ewald@kbh.uu.se)
Mats Målqvist (mats.malqvist@kbh.uu.se)

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Point-by-point response to peer reviews

Referee 1: Sunil S Vernekar

Major Compulsory Revisions

The HBB protocol does not advocate APGAR score for determining or deciding whether the baby is asphyxiated or whether it needs resuscitation. The author needs to clarify as to what was the reason to include APGAR score when the birth attendents were trained in HBB protocol.

Response: Apgar scores were not included in the HBB training, standard HBB protocol was followed. In order for later comparison before and after HBB intervention, Apgar scores were specifically not included in the HBB training. For analysis purposes Apgar score was however extracted from medical journals. The reason for including Apgar-scores in this study is now mentioned in the Data analysis section.

Minor Essential Revisions

1) Page 07 - Data collection: Last sentence "Material captured by the CCD cameras that did not contain a resuscitation situation, such as equipment checks, not newborn babies placed on the resuscitation table for observation, staff using the table as support for updating medical records etc, where reviewed and disregarded as disturbance" to be corrected as "Material captured by the CCD cameras that did not contain a resuscitation situation, such as equipment checks, newborn babies not placed on the
resuscitation table for observation, staff using the table as support for updating medical records etc, were reviewed and disregarded as disturbance"

Response: In this sentence we were referring to babies who are not newborns, but have been placed on the resuscitation table for other reasons than resuscitation, such as observation. Since this was not entirely clear, the sentence has been changed to:

``Material captured by the CCD- cameras that did not contain a resuscitation situation, such as equipment checks, babies placed on the table for other reasons than resuscitation, staff using the table as support for updating medical records etc, where reviewed and disregarded as disturbance.´´

2) Inter- and intra-rater reliability of the observational forms not mentioned.

Response: The last paragraph in the Results section deals with this issue, and results displayed in Figure 2. Reliability has also been mentioned and discussed both in introduction and discussion (limitations section).

3) Page 08- 3rd para last line "These where then compared with existing guidelines" to be corrected as
"These were then compared with existing guidelines"

Response: The sentence has been changed in accordance with reviewers’ request.

Discretionary Revisions

The full form of abbreviation CCD camera has not been mentioned. Of course Budget Dome camera has been mentioned, but still full form is necessary.

Response: The full form of the abbreviation CCD camera is now stated in the first sentence under Data collection as follows:

`` Budget Dome change-coupled device (CCD) Cameras (model no. MTC-505DH) were used to collect data on the hospital’s neonatal resuscitation routines.´´

Referee 2: Haritha Vellanki

Major Compulsory Revisions

1) You acknowledge that the study was approved by the Nepal Health Research Council and the Ethical Review Board of Uppsala University, but I did not see any mention on whether consent was obtained from the families before video recording was done, or if the families were aware of the video recording. Could you please clarify.

Response: Consent was obtained from case and referent mothers included in the
larger HBB trial. For the CCD observations it was not feasible to obtain consent from families in advance, since it is not possible to know in advance which newborns will end up at the resuscitation table. The matter was discussed in the ethical application and it was agreed that anonymity could be maintained.

2) The observation form that was used you stated had 14 sections that were filled out but you only listed 8 (place, date, time of resuscitation, whether the baby was crying when resuscitation was initiated, which specific resuscitation techniques were used, time intervals when they were performed, time to first cry and outcome). In figure 2, you show 12 variables. Could you clarify the inconsistency. If you could share the template of the observation form, that might be helpful. Also, was this form validated for use in your setting?

Response: There were 14 sections to be filled out when the observational forms were filled out. You had to fill out a separate section for whether or not each of the individual resuscitations techniques (stimulation, suction, oxygen and ventilation) was used, and separate sections for the time intervals each resuscitation technique was performed, making 8 variables in total.

The other 6 variables were place, date, and time of resuscitation, whether the baby was crying or not, time of first cry and outcome.

A template of the observational form has now been added in additional files to make it clearer.

There were actually 17 variables that were cross-compared when analyzing reliability. A paragraph under Data analysis has been added to explain this:

``Out of the 14 original sections in the Observational form, 12 were used when analyzing the reliability of the form; place and date of the resuscitation had already been filled out in order to match the two sets of forms together, and thus were not included in the analysis. Using the time intervals given for each individual resuscitation technique, the total times for which each technique were performed were calculated accordingly and analyzed as 4 separate variables. The total time passed from when the baby was placed at the resuscitation table until the first cry was also calculated. In total there were 17 variables individually analyzed and cross-compared in each resuscitation case.``

The form was developed for this study and has therefore not previously been used in this setting.

Figure 2 does contain 17 bars, but unfortunately 5 of the legends seem to have been removed when changing the format of the figure. This has now been corrected.

3) Could you clarify the guidelines currently in-place at your institution that were used to assess the resuscitations.
Response: The guidelines that were used to assess the resuscitations were “Guidelines on Basic Newborn Resuscitation” by World Health Organization and not guidelines from our institution. Some key points are described in both the Background and the Discussion, and there is also a reference to the WHO guidelines in the reference list. The guidelines used at the hospital were also very similar to the WHO guidelines, as stated in the first paragraph in the Discussion.

4) You mentioned in the background section that video recording can provide important information used for quality assessment and education as well as improving teamwork, leadership and communication within the resuscitation work group. I did not see any mention or evaluation of teamwork or communication skills during resuscitation process. You may want to clarify or talk about why that was not studied in your discussion.

Response: The scope of this study did not allow for the evaluation of teamwork and communication skills, since it would require other methods of investigation as well as a separate intervention utilizing the video material. It is however an interesting potential use of the CCD camera technique worth mentioning. This has now been clarified in the Discussion.

5) It would have been useful and interesting to record how many of the deliveries were attended by qualified skilled birth attendants. You could use this data to maybe explain some of the deviation from guidelines during resuscitation.

Response: The study took place at a tertiary referral hospital and it is fair to assume that although a lot of the resuscitations were performed by nursing students, all deliveries were to some extent supervised by qualified skilled birth attendants. There were always qualified birth attendants present in the labour rooms that could assist, especially during the complicated deliveries that end up on the resuscitation table.

Minor Essential Revisions

1) In the 1st paragraph under the section titled Background - you could consider changing the tense in the sentence to say : About 5-10% of babies do not spontaneously breath at birth and require some degree of assistance.

Response: The sentence has been changed in accordance with reviewers’ request.

2) Last sentence in under the section titled background, may need to be shortened. You could consider saying : Video recording had great potential in optimizing newborn resuscitation and therefore further studies are needed to assess its validity and reliability.
Response: The sentence has been shortened to:
``Video recordings have great potential in terms of optimizing newborn resuscitation, and therefore further studies are needed to assess the validity and reliability when used in clinical practice.``

3) 1st paragraph under the section titled Data Collection: the location of cameras needs to be better described. The current language used is a little confusing.

Response: The location of the cameras has now been more clearly described;
``A camera was placed at each of the 6 resuscitation tables in the hospital, arranged accordingly: one in the Operating Theatre, one in the maternal and newborn service centre (MNSC), one in the emergency admission room and three in the labour rooms.``

4) How were the resuscitation cases on the cameras matched to a case record form? Could you clarify.

Response: Time and place of the video recording was captured and compared to medical record and case forms. This has now been explained in the Data collection section.

5) In the 2nd paragraph under the section titled Data Analysis, did you mean: 50 CCD camera recordings were randomly selected (instead of randomized) out of 257 recorded in October and November 2012.

Response: Yes, that is what we meant. The sentence has been corrected to:
``50 CCD-camera recordings were randomly selected out of 257 recorded in October and November 2012.``

Discretionary Revisions
Could you clarify how heart rate was monitored (as you mentioned that pulse oximeters were not used due to technical difficulties)?

Response: Heart rate was not monitored in the study.