Author’s response to reviews

Title: Diverse definitions of prolonged labour and its consequences with sometimes subsequent inappropriate treatment

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Version: 3  
Date: 28 April 2014

Author’s response to reviews: see over
Dear Editor

Thank you for your valuable comments on our paper MS: 2887050101098130 Misclassification of diagnosis and mistreatment of prolonged labour, Research article. We have revised the manuscript based on suggestions made by the referee. The following revisions have been made to answer the comments.

Comments to Soo Downe

However, I'm still not convinced that there is a clear enough message, or that it identifies the most important elements in the data. To make the message more clearly in the article:

- The title and the aim have been changed;
- In the abstract we have inserted the definitions of the four groups of women;
- Under heading background a new first paragraph has been inserted;
- In figure 1 and page 8 first paragraph, the division in group A, B and C has been deleted,
- On page 4, new sentence with a new reference has been inserted;

New Title: Diverse definitions of prolonged labour and its consequences with sometimes subsequent inappropriate treatment

New aim: This study aimed to explore the prevalence and treatment of prolonged labour and to compare birth outcome and women’s experiences of prolonged and normal labour

Abstract under heading methods last sentences: Four groups were identified; women with prolonged labour as identified by documented ICD-codes; women with prolonged labour as identified by partogram inspection but no ICD-code; women with normal labour and women with normal labour augmented with oxytocin.

Under heading background: A new first paragraph with new reference has been inserted

Diagnosing prolonged labour is inherently difficult and it is a controversial issue that has been discussed ever since Friedman introduced the graphic analysis of labour, a study based on 100 women (Friedman, 1954). Using the same criteria and definition of prolonged labour and labour progress for every woman, both for nulliparaous and multiparaous has recently been questioned by Laughon and coworkers (2012). In their work of defining different patterns in labour progress they propose an alternative approach to diagnose a slow progress of labour. This challenges the established knowledge and highlights that an accurate diagnosis of prolonged labour is important for evidence based clinical decision making and for women who experience a prolonged labour.

Page 4 First paragraph a new third sentence with new reference has been inserted

A historical criteria based on previous evidence about progress of labour in the practise of labour management that may no longer be clinically useful (Calhill, A)

Page 8 first paragraph The sentence has been changed and the division in group A, B and C has been deleted. Of the 829 remaining women included in the study,
649 were not diagnosed with prolonged labour, 113 had an ICD diagnostic code of prolonged labour also confirmed in the partogram, and 67 did not have an ICD code, but it was evident in the inspection of the partogram that labour was prolonged (figure 1). In the group of women with normal labour, 27% received augmentation with synthetic oxytocin despite the lack of documented ICD-code or evidence on the partogram of prolonged labour, (figure 1).

It is highly unlikely that 20% of women actually have a labour that is so prolonged that is dystocic, requiring intervention. This statement therefore raises the question as to whether the negative effects found in the women's experiences are a consequence of having a labour that is, per se, pathological, or whether they are a consequence of being diagnosed as having prolonged labour, and therefore having unnecessary interventions, including oxytocin.

We have only presented the prevalence of dystocia according to the numbers of women who were identified either by a code and inspection of partogram or only by inspection of partogram (fig 1) We also refer to other studies that present higher prevalence than we do in this study (Kjaergard, 2009; Selin, 2009).

The observation that women with a diagnosis of prolonged labour have longer labours, and that they are more likely to be distressed by this is not very novel. Indeed, although there are some associations in the data that suggest this, the actual numbers of women affected are not, apparently, very high (again, as noted by one of the other reviewers).

To make the message clear and to clarify our results we have changed table 2, table 3, 5 and inserted table 6

Page 8 second paragraph we have clarified the groups which are included in respective analyses

Crude and adjusted odds ratios with a 95% confidence interval (Rothman, 2002) were calculated between the two groups of prolonged labour with and without diagnosis and between the groups of normal labour, with and without oxytocin augmentation. Finally, logistic regression models were performed in order to reveal factors most strongly associated with a negative birth experience in women with a prolonged labour and in women with normal labour.

Page 9 The second paragraph and Table 2 has been changed.
Length of labour and experience of pain are shown in Table 2. Both groups of women following a prolonged labour reported longer lengths (measured in hours), and they also viewed the progress of labour as prolonged and they experienced labour pain more negatively compared to women with normal labour. In the group of women with normal labour, women with oxytocin augmentation reported significantly longer lengths (measured in hours) compared to women without oxytocin augmentation. They also perceived their progress of labour as slow although the progress of labour was not diagnosed as prolonged. The pain experience did not differ between the two groups of women with normal labour.
Table 6 presents the results from a multiple regression analysis of the most important feelings associated with a negative birth experience among women following a normal labour (n=649). Women with a normal labour who had a negative birth experience agreed significantly more with the statement that it was exciting to give birth and agreed more often with the statement that it was a pain to give birth.

I think that, if they were inclined to do this, the authors could be advised to restructure the paper to make something like the following points, as this will make it an important paper, with new observations that challenge current maternity care norms and practices, and that will definitely be worth publishing:

The data of this study was collected with the intention of classifying labours if they were prolonged or not and of recording the use of oxytocin augmentation. The numbers of prolonged with and without codes and the use of oxytocin augmentation are the result of the study. It would be wrong to make hypothesis testing with data that does not permit statistical analysis with that kind of division in comparative groups. We think that the statistical analyses we have used are appropriate for this data collection because of its descriptive and comparative quality. We have showed that the experiences differ between and within the group of prolonged labour compared with and within the group of normal labour. And that mode of delivery, the length of labour and pain experience differs between women with and one without diagnosis of prolonged labour and between women with normal labour with and without oxytocin augmentation. The result showed significant differences between women with normal labour, with and without oxytocin augmentation. We also present the factors and feelings that contributed most strongly to a negative birth experience both in women with prolonged and normal labour.

I would recommend that they don't focus in the discussion and conclusions on the need for staff to respond to womens experiences, but that the conclusion should be a call to reduce the overdiagnosis and overuse as a means to improving womens experiences. This second argument is more like the one I have proposed at the beginning of this comments section.

Abstract conclusion and page 13 The third sentence in the conclusion has been changed.

Abstract conclusion: There is a need for increased clinical skill in identification and classification of prolonged labour, in order to give care with high quality for all women regardless of whether they experience prolonged labour or not to improve women’s maternal health and wellbeing after birth

Page 13 Conclusion third sentence
Increased clinical skill and a good documentation of the progress of labour in medical records, are of great importance to identify and classify prolonged labour, in order to give care with high quality for all women regardless of whether they experience prolonged labour or not to improve women’s maternal health and wellbeing after birth.
Needs some language corrections before being published

We have restructured and reworked the manuscript and a new proof reading has been done

Comments to Susan McDonald

1. Page 6 How closely aligned was the women's self rating of length of labour and the length of labour recorded/reportedin the medical history

In table 2 we present women’s self-rated length of labour and birth (in hours), their perceived length of labour (0-7, prolonged to rapid), pain intensity (0-7, no pain to worst pain imaginable). We found in both groups of prolonged labour with and without diagnosis that women’s self rated length was closely aligned through observation of the partogram since they reported longer births (measured in hours) more than twelve hours. Twelve hours or more is one of the definitions of prolonged labour according to World Health Organization: International statistical classification of diseases and related health problems: ICD-10, 10. rev., 2008 edn. Geneva: World Health Organization; 2009.

2. Page 7 What other reasons were cited for augmentation of labour (or use of oxytocin in the absence of prolonged labour. For example prolonged ruptured membranes, spurious labour etc)

Page 7 A new paragraph has been inserted

Prolonged labour was identified in two ways. First, all birth records were scrutinized manually for medical diagnosis according to the international classification for disease (ICD10) (World Health Organization, 2009), which defines prolonged active phase of labour as progress of slower than one cm per hour with the following codes (O62, O62.0, O62.1),

a) as irregular or poor uterine contractions with the following codes (O62.4, O62.8, O62.9),

b) as a labour with regular uterine contractions for more than 12 hours (O63, O63.0 O63.9),

c) and/or as a cervical dilation of ten cm for more than three hours (O63.1).

In reporting the use of oxytocin, only records which indicated use for augmentation of labour were included. In the context of this paper normal labour refers to women who did not have a prolonged labour. Four groups were identified; women with prolonged labour as identified by documented ICD-codes; women with prolonged labour as identified by partogram inspection but no ICD-code and women with normal labour and women with normal labour augmented with oxytocin.

3. Pages 7-11. The aim of your outcomes is also still a little unclear to the reader.
While it is well documented and perfectly understandable that women who have a prolonged labour, unplanned operative birth express much more negative feelings about their birth experience, unless you can clearly show that for the group of women who did receive oxytocin augmentation in the absence of prolonged labour were negatively affected in terms of birth outcome and or emotional impact, perhaps you should concentrate on the women who upon retrospective note review were shown to have had a labour classifiable as prolonged, in terms of the possible impact of not having had oxytocin, when you are talking about maltreatment (perhaps even using the word inappropriate application of oxytocin).

**Page 8 first paragraph** we have clarified the groups which are included in respective analyses. Crude and adjusted odds ratios with a 95% confidence interval (Rothman, 2002) were calculated between the two groups of prolonged labour with and without diagnosis and between the groups of normal labour, with and without oxytocin augmentation. Finally, logistic regression models were performed in order to reveal factors most strongly associated with a negative birth experience in women with a prolonged labour and in women with normal labour.

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Length of labour and experience of pain are shown in Table 2. Both groups of women following a prolonged labour reported longer lengths (measured in hours), and they also viewed the progress of labour as prolonged and they experienced labour pain more negatively compared to women with normal labour. In the group of women with normal labour, women with oxytocin augmentation reported significantly longer lengths (measured in hours) compared to women without oxytocin augmentation. They also perceived their progress of labour as slow although the progress of labour was not diagnosed as prolonged. The pain experience did not differ between the two groups of women with normal labour.

**Page 10 Third paragraph Table 6 has been inserted**

Table 6 presents the results from a logistic regression model of the most important feelings associated with a negative birth experience among women following a normal labour (n=649). Women with a normal labour who had a negative birth experience agreed significantly less often with the statement that “it was exciting to give birth” and agreed more often with the statement that it was “painful to give birth”.

3. Pages 7-11. The aim of your outcomes is also still a little unclear to the reader. Perhaps you should concentrate on the women who upon retrospective note review were shown to have had a labour classifiable as prolonged, in terms of the possible impact of not having had oxytocin, when you are talking about maltreatment (perhaps even using the word inappropriate application of oxytocin).

**Page 10 under heading Discussion second sentence has been changed**
There was also an inappropriate use of oxytocin augmentation among the groups.

**Page 11 last paragraph maltreatment has been replaced**

The paradox that healthy women received treatment for prolonged labour and women with prolonged labour sometimes (14.5%) were not treated could be viewed as an inappropriate use of oxytocin (affecting 40%) that should be noticed and dealt with regarding identification, classification and treatment of prolonged labour.

4. Page 12. In your conclusion when referring to to the need for increased skill being required in identification of prolonged labour to avoid mistreatment, you may wish to highlight the importance of clear documentation in the clinical record.

**Page 13 Conclusion, we have inserted a new third sentence.**

Increased clinical skill and a good documentation of the progress of labour in medical records, are of great importance to identify and classify prolonged labour, in order to improve care for all women regardless of whether they experience prolonged labour or not.

5. I would also suggest that 2 months post birth is still quite an early timeframe to elicit information regarding future pregnancies, particularly if the birth experience has been very different from what the woman had planned or anticipated. Most women experiencing birth for the first time need a significant period of time to recover and perhaps 12 months might be a more realistic marker for reviewing all aspects of emotional and physical health.

**Page 11 first paragraph, second sentence has been changed**

Maybe this could reflect a negative attitude towards having more children although two months after birth is a very early timeframe regarding future pregnancies. Still the negative birth experience can make the woman associate birth with fear for future pregnancy and childbirth (Gottvall 2002).

**Page 12 first paragraph, third sentences, we have inserted, that it is their view two months after birth**

As it was shown that these more ‘soft variables’ had a strong impact on women’s experiences of the length labour and emergency cesarean as well as their view towards future reproduction two months after birth.

6. I appreciate your fantastic skill in writing your paper in English. There are still just a little more work required to refine the English.

**We have restructured and reworked the manuscript and a new proof reading has been done**