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Expectant parents’ preferences for mode of delivery and trade-offs of outcomes for breech presentation

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Abstract

Objective
To assess patients’ preferences and trade-offs for mode of delivery in case of breech presentation at term.

Methods
Eighty women (40 with a fetus in breech presentation and 40 with a fetus in cephalic presentation) with a gestational age from 36 weeks onwards were offered scenarios of vaginal and caesarean breech delivery in which one-month and two-year neonatal and maternal complication rates were varied; expectant fathers (when present) were interviewed separately. Thresholds for complication rates where patients switch preferences were visualised graphically in trade-off curves. Differences in preference thresholds were tested using the Wilcoxon signed ranks test.

Results
Caesarean delivery was the preferred mode of delivery for breech presentation in 65% of the patients interviewed. The trade-off questions showed that the two-year neonatal outcome after breech delivery was the most important outcome for the mothers, whereas the fathers were more influenced by the maternal outcome.

Conclusion
When realistic assumptions for complications are made, most women prefer a caesarean delivery over vaginal delivery for at term breech presentation. In the balance of pros and cons, two-year neonatal outcome is the most important factor in the decision between caesarean and vaginal delivery.

Practice implications
The results of this study can be used by the clinician to help patients weigh risk, benefit, and potential harm with regard to breech delivery.
Introduction

Breech presentation occurs in 3% to 4% of all term pregnancies\(^1\). Breech presentation refers to the position of the baby in the uterus such that it will be delivered buttocks first as opposed to the normal head first position, which is called cephalic position. Breech delivery is associated with a higher neonatal mortality and morbidity as compared to cephalic delivery\(^2;3\). In October 2000, the results of a large multi-centre randomised controlled trial (Term Breech Trial), comparing planned vaginal delivery with a planned caesarean delivery, were published\(^4\). Data from this trial demonstrated a reduction in perinatal and neonatal mortality or serious morbidity one month after birth for those who had a caesarean delivery.

Since the publication of this trial, the caesarean delivery rate in women with a fetus in breech presentation in the Netherlands has increased from 45% to around 80%. This change was accompanied by a substantial decrease in perinatal mortality\(^5\). This beneficial effect might have a drawback as caesarean deliveries are associated with increased maternal morbidity, longer hospital admission and consequences for future pregnancies, such as an increased risk of abnormal placental implantation, uterine rupture and, ultimately, fetal death due to uterine rupture\(^6;9\).

The two-year neonatal outcomes of the Term Breech Trial did not differ between the two groups\(^10\). In view of this possible discrepancy between short-term and long-term neonatal outcome, insight into whether and how patients trade-off outcomes with their preferred mode of delivery is needed\(^11\).

To our knowledge, patient’s preferences for mode of delivery have been addressed in only a few earlier studies. A search of the major databases with the search terms “delivery”, “patient”, “preference” and “request” yielded one relevant review\(^12\). In this review of nine articles that focused on women’s preference for caesarean delivery, the request rate for a caesarean delivery varied between 7% and 100%. However, these articles focused on the general population or were limited to women undergoing a caesarean delivery. A patient satisfaction study, in which participants of the Term Breech Trial were sent a questionnaire to assess retrospectively likes and dislikes about their childbirth experiences and their views about their intrapartum care and care providers, showed that planned caesarean delivery was associated with significantly less concerns about the baby’s health. Other aspects did not differ in the planned caesarean delivery and planned vaginal birth groups\(^13\). None of the studies report on the fathers’ preferences. We are not aware of prospective studies that focused on patients’ preferences on breech delivery, i.e. prior to the actual delivery.
The aim of this study was to assess expectant parents’ preferences for mode of delivery in case of term breech position, and their judgment of the neonatal short- and long-term risks as well as the maternal risks.

**Materials and methods**

**Study design**
Pregnant women were offered scenarios of vaginal and caesarean breech delivery in which one-month and two-year neonatal and maternal complication rates were varied. The design of the current study was based on previous published studies on patients’ preferences in subfertility\textsuperscript{14,15}, and consisted of structured verbal face-to-face interviews administered in a cohort of pregnant women and expectant fathers. The study was conducted alongside a randomised controlled trial comparing external cephalic version with nifedipine, which causes uterine relaxation, with external cephalic version without nifedipine. Results of this trial will be reported in detail elsewhere.

**Setting and patients**
Women who had an otherwise uncomplicated singleton pregnancy with a fetus in breech position at a gestational age of 36 weeks and onwards were invited to participate in this study. This was before possible randomisation in the external cephalic version trial. A second group was recruited among pregnant women with a singleton fetus in cephalic presentation. The latter were asked to imagine their baby was in breech position. Expectant fathers (if present) were interviewed separately. Interviews were performed at the outpatient department of three teaching hospitals and in a midwives clinic. Selection of participants was not consecutive, but depended upon the presence of one of the interviewers on non-fixed scheduled days.

Two of the authors (MK or LG) individually administered the face-to-face interviews. Participants in the breech group were interviewed in the period after the discovery of the breech presentation, but before a possible external cephalic version. Participants in the cephalic group were interviewed after 36 weeks, but prior to delivery. Baseline characteristics recorded were age, parity, ethnicity and level of education. Ethnicity was defined as Caucasian, Surinam, African or other. Level of education was classified as low (i.e. completion of secondary school or less), median (i.e. undergraduate education) or high education (i.e. post graduate education).
Methods

A structured interview was designed to assess preferences for the mode of delivery in women with a fetus in breech presentation. Furthermore, the extent to which these preferences were sensitive to changes in maternal and fetal risks (preference switch) was investigated. This interview was developed after consultation with clinical and methodological experts. The interviews were conducted in a standardised manner with the aid of an information sheet (see appendix) on both modes of delivery. The interviews lasted approximately 30 to 45 minutes. The first five interviews were used as pilot interviews. Fetal and maternal outcome mentioned were death or serious morbidity as defined in the Term Breech Trial7. Poor short-term neonatal outcome was defined as death or serious morbidity in the first month after birth. Poor long-term neonatal outcome was defined as death or neurodevelopmental delay at two years of age. Poor maternal outcome was defined as death or serious morbidity that occurred within six weeks post partum. A more detailed description of poor neonatal and maternal outcome is given in Table 1. Participants were informed about the hypothetical character of the interview and the fact that their answers would have no consequences for treatment.

Table 1 Neonatal and maternal mortality and serious morbidity as defined in the Term Breech Trial.

<table>
<thead>
<tr>
<th>Neonatal consequences</th>
<th>Maternal consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term mortality</td>
<td>Short-term mortality</td>
</tr>
<tr>
<td>Perinatal or neonatal mortality at &lt; 28 days of age</td>
<td>Maternal mortality during the first 6 weeks post partum</td>
</tr>
<tr>
<td>Short-term serious morbidity</td>
<td>Short-term serious morbidity</td>
</tr>
<tr>
<td>Morbidity at &lt; 28 days of age:</td>
<td>- Haemorrhage &gt; 1500 ml</td>
</tr>
<tr>
<td>Birth trauma: cerebral haemorrhage</td>
<td>- Blood transfusion</td>
</tr>
<tr>
<td>Spinal cord injury</td>
<td>- Dilation and curettage</td>
</tr>
<tr>
<td>Basal skull fracture</td>
<td>- Extension of the uterine scar</td>
</tr>
<tr>
<td>Significant genital injury</td>
<td>- Pneumonia</td>
</tr>
<tr>
<td>Seizures</td>
<td>- Early postpartum depression</td>
</tr>
<tr>
<td>Hypotonia</td>
<td></td>
</tr>
<tr>
<td>Coma</td>
<td></td>
</tr>
<tr>
<td>Low Apgar scores</td>
<td></td>
</tr>
<tr>
<td>&gt;=24 h intubation and ventilation</td>
<td></td>
</tr>
<tr>
<td>&gt; 7 tube feeding</td>
<td></td>
</tr>
<tr>
<td>&gt;=4 days care in neonatal ICU</td>
<td></td>
</tr>
<tr>
<td>Long-term mortality</td>
<td></td>
</tr>
<tr>
<td>Death at &lt; 2 years of age</td>
<td></td>
</tr>
<tr>
<td>Long-term serious morbidity</td>
<td></td>
</tr>
<tr>
<td>Neurodevelopmental delay at two years of age</td>
<td></td>
</tr>
</tbody>
</table>
Interview: treatment preferences and outcome trade-offs

Firstly, participants were presented with a hypothetical scenario representing the decision concerning mode of delivery for a fetus in breech presentation (baseline scenario). This scenario was visually supported by a schematic drawing representing the baseline scenario (see appendix). The interviewer systematically explained the scenario including the nature of fetal and maternal consequences of a planned vaginal and planned caesarean delivery in case of breech presentation. The initial risk of poor short-term neonatal outcome after planned vaginal delivery and planned caesarean delivery was set at 5% and 2%, respectively (initial risk difference of 3% between both modes of delivery). The risk of poor long-term neonatal outcome was set at 3% for both modes of delivery. The risk of poor maternal outcome after a planned vaginal delivery and planned caesarean delivery was set at 3% and 4%, respectively. Based on the information presented in this baseline scenario, which is in agreement with the findings in the Term Breech Trial, women were asked to indicate their preferred mode of delivery.

Subsequently, the information in the scenario was systematically adjusted depending on the preferred mode of delivery expressed at the baseline scenario. For women preferring a vaginal delivery, the risk of short-term neonatal adverse outcome after vaginal delivery was increased with steps of 1% until women switched their preference to a planned caesarean delivery. Alternatively, if a planned caesarean delivery was the preferred mode of delivery, the risk of short-term neonatal adverse outcome for a caesarean delivery was raised with 1% steps until the preference changed to a vaginal delivery. Similar trade-off procedures were followed for long-term neonatal risks and short-term maternal risks. The decision to adjust the percentages for various adverse outcomes by 1% steps was based upon the small initial difference between the two treatments. We assumed smaller steps would be too difficult to grasp. There are however no method guidelines for studies like this, and we realize the choice for 1% steps is somewhat arbitrary.

Questionnaire: judgment of treatment characteristics

Patients’ judgments of the importance of individual characteristics of treatment modalities, such as fear for the surgical procedure or fear for consequences for mother or child, were assessed for various aspects using five-point Likert scales. These scales were anchored as “strongly agree”, “agree”, “neither agree nor disagree”, “disagree”, and “strongly disagree”. The items were arranged by their average score and grouped by statement.

Statistical analysis

To visualise the preference thresholds we calculated the percentage of women who preferred caesarean delivery for the particular probabilities of poor maternal or neonatal outcome.
The cumulative percentage of women preferring a caesarean delivery was plotted against the difference in poor outcome rates between a caesarean delivery and a vaginal delivery. In the resulting trade-off curves, negative difference in poor outcome rate represented a risk difference in favour of a vaginal delivery, whereas a positive difference represented a difference in favour of a caesarean delivery. Differences in preference thresholds were tested using the Wilcoxon signed ranks test.

Finally, we explored whether preferences were associated with the baseline characteristics age, parity, ethnicity and level of education, using tests for parametric measures of association (Chi square test and Student’s T-test for categorical and continuous data, respectively). We assumed that 80 women would be sufficient to determine the variability across individual women’s preferences, and 40 in each group to detect important differences between women with breech versus cephalic pregnancies.

Results

We interviewed 80 expectant mothers (40 with a fetus in breech position and 40 women with a fetus in cephalic position) and 27 expectant fathers (six with a fetus in breech position and 21 with a fetus in cephalic position). The patient characteristics are listed in Table 2.

Table 2 Baseline characteristics

<table>
<thead>
<tr>
<th></th>
<th>All women (N = 80)</th>
<th>Breech (N = 40)</th>
<th>Cephalic (N = 40)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (years)</td>
<td>32 (18-43)</td>
<td>32 (18-43)</td>
<td>32 (22-43)</td>
<td>0.75</td>
</tr>
<tr>
<td>Mean gestational age (weeks)</td>
<td>37.0</td>
<td>36.7</td>
<td>37.4</td>
<td>0.16</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
<td></td>
<td>0.89</td>
</tr>
<tr>
<td>0</td>
<td>42 (53%)</td>
<td>22 (55%)</td>
<td>20 (50%)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>24 (30%)</td>
<td>11 (28%)</td>
<td>13 (33%)</td>
<td></td>
</tr>
<tr>
<td>&gt;1</td>
<td>14 (18%)</td>
<td>7 (18%)</td>
<td>7 (18%)</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td>0.39</td>
</tr>
<tr>
<td>Caucasian</td>
<td>52 (65%)</td>
<td>26 (65%)</td>
<td>26 (65%)</td>
<td></td>
</tr>
<tr>
<td>Surinam</td>
<td>12 (15%)</td>
<td>3 (7.5%)</td>
<td>9 (23%)</td>
<td></td>
</tr>
<tr>
<td>African</td>
<td>10 (13%)</td>
<td>6 (15%)</td>
<td>4 (10%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>6 (8%)</td>
<td>5 (13%)</td>
<td>1 (3%)</td>
<td></td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
<td></td>
<td></td>
<td>0.28</td>
</tr>
<tr>
<td>Low</td>
<td>14 (18%)</td>
<td>4 (10%)</td>
<td>10 (25%)</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>23 (29%)</td>
<td>12 (30%)</td>
<td>11 (28%)</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>39 (49%)</td>
<td>21 (53%)</td>
<td>18 (45%)</td>
<td></td>
</tr>
</tbody>
</table>

* Chi square test
Mean maternal age was 32 years, mean gestational age was 37 weeks and 53% of the women were nulliparous. Patient characteristics of the two groups showed no statistically significant differences.

**Interview: treatment preferences**

For the baseline scenario, based on the findings in the Term Breech Trial, 70 (65%) participants preferred a planned caesarean delivery (66% of the mothers and 63% of the fathers). There was no difference between the breech group and the cephalic group ($P = .81$).

**Interview: outcome trade-offs**

Figure 1 shows the cumulative percentages of mothers preferring a planned caesarean delivery in relation to neonatal or maternal risks. In this figure it is visible that between risk differences of -5% and +8% in one-month neonatal complication rate, 80% of the mothers changed their preference. In contrast, variations in the two-year neonatal complication rate generated a preference switch for 80% when risk differences were varied between -2% and +2% ($P = .01$). The window for the maternal complication rate was the widest (between -21% and +5%). There were no differences between the breech and cephalic group. We did not find a significant association between any of the baseline characteristics and the preferred mode of delivery.

Figure 2 shows the cumulative percentages of fathers preferring a planned caesarean delivery in relation to neonatal or maternal risks. The window between which 80% of the
Figure 2 Paternal preferences for a caesarean delivery (CD) relative to a vaginal delivery (VD): trade-off curves for neonatal and maternal outcomes combined in one graph. The dotted horizontal lines represent the point where 80% prefers a caesarean and vaginal delivery respectively.

Figure 3 Relative importance of arguments for patient’s preferences. Data presented as 100% stack bars.
fathers switched their preferences was very narrow for all complication rates (between -1% and +8% risk difference) with the narrowest window for maternal complications. We performed no additional analysis because of the small size of this group.

**Questionnaire: judgment of treatment characteristics**

The evaluation of treatment characteristics affecting their preferences indicated that the arguments “safest route for the baby” and “fear for a handicapped child” were considered to be of most importance for the women. On the other hand, “chance of home delivery in a next pregnancy” (when caesarean delivery could be avoided) and “fear for the gynaecologist” were factors of the lowest importance (Figure 3).

**Discussion and conclusion**

**Discussion**

We studied preferences of expectant parents with an at term fetus in breech position for either planned vaginal delivery or planned caesarean delivery. These parents indicated a preference for a caesarean delivery. The mother’s preference for mode of delivery was mostly influenced by a change in two-year neonatal outcome, whereas maternal outcome was only of minor importance. In contrast, the father’s preference was mostly influenced by the maternal outcome.

A limitation of this study is the fact that we adjusted the percentages for various adverse outcomes, whereas in reality the incidence of adverse outcomes is not amenable to change. However, the results of this study put forward that there is a patient tendency to pursuit an absolute zero risk for the fetus. This tendency has also been described about clinicians 16. There will however always be a risk of pregnancy and childbirth which is no less than in life generally. The results of this study can be used by the clinician to help patients weigh risk, benefit, and potential harm with regard to breech delivery.

We used a face-to-face interview as assessment procedure. The flexible nature of the interview is both a methodological strength and weakness at the same time. The provided information can be tailored to the needs of individual patients, but it also makes it prone to bias of both patient and interviewer. Such instrument related bias can occur due to a subjective presentation of the case scenario by the interviewer. Since two interviewers performed the interview in a structured way we feel that this bias is limited. Another possible limitation is the fact that we interviewed mothers and fathers separately. However, as in reality decisions regarding delivery are also influenced by the partner, it cannot be excluded.
that in reality, couples’ preferences might turn out to be different. A strong point of our study is the inclusion of a control group of women with a fetus in cephalic presentation. Although the dilemma is more hypothetical for women in the cephalic group as compared to the breech group, the preferences of women with a fetus in breech presentation and in cephalic position were similar.

In the process of decision making it is also important to realise that a caesarean delivery has consequences for future reproductive performance. Complications like uterine rupture and major haemorrhage, occur more often in women with a previous caesarean delivery as compared to women without a previous caesarean. As the dimension of future reproductive health would have complicated our preference study, we did not consider this issue in our interviews. However, we think that future reproductive health issues would probably shift the preference more towards vaginal delivery.

Our preference study showed that the two-year neonatal outcome was more important in the choice for the mode of the delivery than the one-month neonatal outcome. The Term Breech Trial did not show difference in two-year neonatal outcome. This trial was however stopped after an interim analysis. In view of this finding, one could question whether the decision to stop the Term Breech Trial was justified. Now, due to sample size limitations, a definitive conclusion about the two-year neonatal risk either in favour of caesarean delivery or in favour of vaginal delivery could not be drawn. It is therefore questionable whether evidence from the Term Breech Trial is sufficient to make a definitive decision on the mode of delivery, since we found that the two-year neonatal outcome is the most important one.

Conclusion
In conclusion, when realistic assumptions for complications are made, most women prefer a caesarean delivery over vaginal delivery. In the balance of pros and cons the two-year neonatal outcome was the most important factor.

Practice implications
This study adds to the understanding of decision making of expectant parents’ in case of breech presentation. As long-term consequences seem to play the most important role in the decision making process, the clinician has to address this when counselling patients with breech presentation.
Acknowledgements

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References


