Improving management of breech presentation at term

Vlemmix, F.

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Implementation of external cephalic version in the Netherlands: a retrospective cohort study

Floortje Vlemmix
Ageeth N. Rosman
Susan te Hoven
Suzanne van de Berg
Margot A.H. Fleuren
Marlies E.B. Rijnders
Antje Beuckens
Brent C. Opmeer
Ben Willem J. Mol
Marjolein Kok

Submitted
Chapter 9 Implementation of external cephalic version in the Netherlands

ABSTRACT

Background External cephalic version reduces the rate of elective caesarean sections due to breech presentation at term. The aim of this study was to evaluate the implementation of external cephalic version in the Netherlands and to explain variation in implementation rates by hospital characteristics.

Methods We invited 40 hospitals to participate in this retrospective cohort study. We reviewed hospital charts of singleton breech deliveries from 36 weeks gestation and onwards. We documented whether an external cephalic version attempt was performed, reasons if not, mode of delivery and hospital characteristics.

Results We included 4,770 women from 36 hospitals. External cephalic version was performed in 2,443 women (62.2% of eligible women, range 8.2% to 83.6% in different hospitals). Implementation rates were higher in teaching hospitals, hospitals with special office hours, larger obstetric units and hospitals located in larger cities. Suboptimal implementation is mostly caused by the care provider not offering the treatment and secondly due to women not opting for the offered attempt.

Conclusion External cephalic version implementation rates vary widely among hospitals, and are suboptimal. A prerequisite for designing a proper implementation strategy is a detailed understanding of the reasons for not offering and not opting for external cephalic version.
INTRODUCTION
Breech presentation occurs in 3 to 4% of all term pregnancies.\textsuperscript{1} Vaginal breech delivery is related to increased neonatal mortality and morbidity.\textsuperscript{2,3} As a consequence, planned caesarean section (CS) rates for breech delivery have risen up to 94%.\textsuperscript{4} The downside of this high caesarean rate are risks related to future pregnancies and deliveries with increased maternal and foetal morbidity and mortality.\textsuperscript{5,6,7,8} External cephalic version (ECV) reduces the rate of breech presentation at term and leads to a significant reduction in caesarean delivery from almost 80% till just below 40% (RR 0.63 (95%CI 0.44-0.90), without an increased risk for the neonate.\textsuperscript{9,10} Therefore, ECV is considered as an important obstetrical intervention and is recommended as the first treatment of choice in case of term breech presentation in national and international guidelines.\textsuperscript{11–14} Despite the recommendations of national guidelines, not all women with a term breech presentation receive an ECV attempt. An inventory survey among all hospitals in the Netherlands in 2007 reported that 5% of the gynaecologic practices did not perform or referred for ECV at all, even though women with breech presentation were seen in these hospitals.\textsuperscript{15} A small prospective cohort study in the Netherlands reported that 26% of women with a fetus in breech presentation did not receive an ECV attempt; in 48% of these cases, the obstetrician decided not to perform ECV, 37% of women declined a version attempt, and 15% gave birth before the version was performed.\textsuperscript{16} International studies showed that the number of women eligible for ECV who were not offered an attempt range from 4% to 33% and the number of women declining ECV range from 20-30%.\textsuperscript{17–19} Insight in factors associated with poor implementation of ECV is needed to design effective strategies to improve implementation. The objective of this study was to evaluate the implementation rate of ECV in a large cohort in the Netherlands and to assess the reasons not to perform ECV.

MATERIAL AND METHODS
We invited 40 randomly selected hospitals in the year 2010, to participate in this retrospective cohort study. Hospitals were asked for permission to review all patient files of singleton breech deliveries from 36 weeks gestation and onwards (as national guidelines advise ECV from 36 weeks). We identified
all consecutive breech deliveries between the 1st of January 2008 and the 31st of December 2009 from hospital birth registers. We collected data on parity, ECV (attempt, outcome of attempt, gestational age at ECV, reasons if no ECV was performed, and mode of delivery. Unfortunately, we were not able to collect data on cephalic deliveries after a successful ECV attempt as the majority of hospitals do not systematically register ECV attempts. We collected baseline characteristics of participating hospitals: number of birth per year (categorized <1000, 1000-1999, ≥2000), type of hospital (teaching hospital or not), presence of ECV office hour within the region of the hospital (either led by midwives, gynecologists or a collaboration), size of the city (categorized in quartiles based on number of inhabitants in the city where the hospital is located), and localization of the hospital in the north, east, west or south of the Netherlands. Our primary outcome was the implementation rate of ECV, for this study defined as the number of ECV attempts performed in women who had a breech presentation at time of delivery and were eligible for ECV. Secondary outcomes were the number of women with a contraindication for ECV according to national guidelines, the number of women who were not offered ECV, and who declined ECV. Statistical analyses were carried out using SPSS 20.0. We used a logistic regression accounting for clustering of observations (generalized estimating equations, or GEE) to analyse the effect of the hospital characteristics on the implementation of ECV. Those characteristics significantly related to ECV in the univariate analyses (p<0.05), were analysed in a multivariate analyses.

RESULTS

Of the 40 invited hospitals, 36 gave approval for participation in this study. We identified 4,770 patients with a singleton fetus in breech presentation at birth. Baseline characteristics are summarized in Table 1. Breech presentation was not diagnosed until birth in 357 women (7.5% (range 0% to 20%)) (Table 2). A contraindication for ECV according to Dutch guidelines was present in 367 women (7.5%). Most common contraindications were structural uterine anomaly (2.5%), and fetal growth restriction (1.6%). Hundred twenty women (2.8%) had an indication for a planned CS other than breech presentation. Thus, 3,926 (82.3%) of women were eligible for ECV.
Counselling for ECV

Of 3,926 women eligible for ECV, 1,483 (37.8%) did not receive an ECV attempt. Reasons for not receiving an ECV attempt are given in Table 3. Of these 1,483 women, 39 (2.6%) cases the women delivered before the scheduled ECV attempt. In 671 (45.2%) cases the women were counselled but they declined ECV while 773 (52.1%) women were not counselled by the health care provider and thus not offered an ECV. Reasons not to offer ECV were reported in only 275 of the 773 cases (35.6%). The most important reasons not to offer ECV were often relative contra indications not mentioned in the national guideline, such as assumed unfavourable factors for a successful ECV (high BMI, macrosomia, anterior placenta, descended breech or advanced gestational age; n= 109 (14.1%)). Other reasons mentioned were possible increased maternal or fetal risk (anticoagulant use, Hepatitis B, HIV, one previous low transverse caesarean, or vaginal blood loss (unknown cause); n = 166 (21.5%)).

Hospital characteristics

Hospitals were located in villages and cities of various sizes; the smallest had 5,000 and the largest 800,000 inhabitants. The categorisation of the hospitals according to the size of the city is shown in Table 4. Twenty six (72%) were teaching hospitals. In 44% of the regions affiliated to the hospitals there was a special ECV office hour, either led by midwives, gynaecologists or a collaboration between these two. Thirteen hospitals had less than 1,000
births per year, 19 with 1,000-2,000 births per year and four with over 2,000 births per year, regional home deliveries not included.

Table 2. Contraindications for ECV according to national guidelines

<table>
<thead>
<tr>
<th>Category</th>
<th>Eligible</th>
<th>Overall N= 4,770 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligible</td>
<td>3,926 (82.3)</td>
<td></td>
</tr>
<tr>
<td>ECV attempt</td>
<td>2,443 (51.2)</td>
<td></td>
</tr>
<tr>
<td>No ECV attempt</td>
<td>1,483 (31.1)</td>
<td></td>
</tr>
<tr>
<td>Not Eligible</td>
<td>844 (17.7)</td>
<td></td>
</tr>
<tr>
<td>Undiagnosed breech presentation</td>
<td>357 (7.4)</td>
<td></td>
</tr>
<tr>
<td>Absolute contraindication ECV</td>
<td>367 (7.5)</td>
<td></td>
</tr>
<tr>
<td>Uterine anomaly</td>
<td>119 (2.5)</td>
<td></td>
</tr>
<tr>
<td>Fetal growth restriction</td>
<td>75 (1.6)</td>
<td></td>
</tr>
<tr>
<td>Hypertension /PE / HELLP</td>
<td>46 (1.0)</td>
<td></td>
</tr>
<tr>
<td>Oligohydramnion</td>
<td>52 (1.1)</td>
<td></td>
</tr>
<tr>
<td>Non reassuring CTG before ECV</td>
<td>10 (0.2)</td>
<td></td>
</tr>
<tr>
<td>Placental abruption in previous pregnancy</td>
<td>5 (0.1)</td>
<td></td>
</tr>
<tr>
<td>(P)PROM</td>
<td>50 (1.0)</td>
<td></td>
</tr>
<tr>
<td>Elective CS indication</td>
<td>120 (2.8)</td>
<td></td>
</tr>
<tr>
<td>&gt; 1 previous SC</td>
<td>48 (1.0)</td>
<td></td>
</tr>
<tr>
<td>Contra indication vaginal delivery</td>
<td>46 (1.0)</td>
<td></td>
</tr>
<tr>
<td>Placenta praevia</td>
<td>36 (0.8)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Eligible patients not having an ECV attempt.

<table>
<thead>
<tr>
<th>Category</th>
<th>Overall N=1,483 (%)</th>
<th>Range among hospitals (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not opting</td>
<td>671 (45.2)</td>
<td>0 - 88.9</td>
</tr>
<tr>
<td>Birth before planned ECV</td>
<td>39 (2.6)</td>
<td>0 - 9.1</td>
</tr>
<tr>
<td>Not offered</td>
<td>773 (52.1)</td>
<td>0 - 96.8</td>
</tr>
<tr>
<td>Reasons to not offer ECV other than contraindication in guidelines</td>
<td>275 (18.5)</td>
<td>0 - 62.9</td>
</tr>
<tr>
<td>HIV, Hep B, anticoagulants</td>
<td>32 (2.2)</td>
<td></td>
</tr>
<tr>
<td>Multiple factors decreasing success rate</td>
<td>109 (7.3)</td>
<td></td>
</tr>
<tr>
<td>One previous CS</td>
<td>52 (3.5)</td>
<td></td>
</tr>
<tr>
<td>Vaginal blood loss</td>
<td>14 (0.9)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>68 (4.6)</td>
<td></td>
</tr>
<tr>
<td>Not offered for unknown reason</td>
<td>498 (33.6)</td>
<td>0 - 96.8</td>
</tr>
</tbody>
</table>
ECV implementation rates

The ECV implementation rate at the hospital level is visualized in Figure 1. [figure 1 invoegen] The mean implementation rate of ECV among eligible women was 62.2% (range 8.2 to 83.6%). Table 4 shows the results of the univariate and multivariate analysis of hospital characteristics in relation to ECV attempts. [table 4 invoegen] Univariate analysis shows a higher ECV implementation rate in teaching hospitals (66.3 vs. 46.8%, OR 2.35 (95% CI 1.4-4.0), and in regions with an ECV office hour (68.1 vs. 56.1%, OR 1.9 (95% CI 1.2-3.0)). There was a lower implementation rate of ECV in hospitals with less than 1000 annual deliveries compared to those with more than 2000 (44.7 vs. 66.1 vs. 56.1%, OR 0.36 (95% CI 0.22-0.59)), and in hospitals located in smaller villages compared to the largest cities (47.3 vs. 71.0%, OR 0.17-0.69)). Most of the hospitals were located in the west of the Netherlands and had a higher ECV implementation rate compared to hospitals located in the North of the Netherlands (68.8 vs. 46.4, OR 3.0 (95% CI 1.1-8.3)). Only size of the city (smaller than 49,000 inhabitants) remained significantly related to ECV implementation rate in the multivariate analyse. The other factors (teaching hospital, ECV office hour, birth per year and region) are closely related to size of the city.

Figure 1. Implementation rate of ECV per hospital. Horizontal line represents the mean implementation rate (62.2%). Hospitals are presented from poorest implementation (below 10%) to good implementation (over 80%), with the majority between 50% and 70%.
DISCUSSION

This study shows that the ECV implementation rate in women with a breech presentation at birth is generally low, and varies widely across hospitals. Poor implementation is mainly caused by health care providers who do not offer ECV to eligible women, followed by women declining an offered ECV. Furthermore, ECV implementation and success rates are poorly registered by hospitals.

Considering the high CS rates for breech presentation we can conclude from the above that there is considerable room to improve obstetric care in women with a term fetus in breech presentation. Ideally, improvement activities should focus on those hospitals with low implementation rates, but without a systematic registration of all external cephalic versions in the Netherlands, this is difficult to establish. Our multivariate analyses show that hospitals in small cities more often have poor implementation rates of ECV. This can be explained by the other regional characteristics: the small hospitals are less frequently teaching hospitals and less often have an ECV office hour. Thus either care in these small hospitals need to be improved or centralising care for breech presentation to larger hospitals nearby might be indicated. One reason that ECV is often not performed, is that care providers do not offer an ECV to their patients. In order to address this reason, it is important to explore the underlying rationale why care providers do not offer ECV. In our study, reasons for not offering an ECV were not registered in the majority of patients’ files. If reported, reasons often did not correspond to the contraindication for EVC as mentioned in the current national guidelines. The large amount and range in percentage of women not opting for ECV might be a reflection of the counselling skills of care providers, or explained by different socio-demographic backgrounds of women. Providing standardized information and offering clients the opportunity to discuss their fears or restraints might abate irrational ideas, and improve the number women opting for ECV. However, a study by Nassar et al. evaluating a decision aid for ECV did show a reduction in decisional conflict scores in women deciding on ECV, but did not alter the amount of women opting for ECV. The number of undiagnosed breech presentations is an important issue in order to improve care for women with breech presentation. The percentage of undiagnosed breech ranged from 0 to 20.0% among hospitals, partly reflecting poor diagnostic quality of care within that hospital and the referring midwifery practices associated with that hospital. This might be improved by the use
of ultrasound during the regular pregnancy check-ups. An Australian study showed a sensitivity of 70% (95%CI 68-72%) and specificity of 95% (96-97%) of clinical examination. They concluded that clinical examination alone as diagnostic test is not sensitive enough in the management of non-cephalic presentation.

**Strengths and limitations**

To our knowledge, this is the largest cohort on ECV implementation thus far and it reflects the implementation rate in a random selection of hospitals and their surrounding midwife practices with varying regional characteristics. Our findings are in line with earlier research. Several studies showed that the number of women eligible for ECV who were not offered an attempt range from 4% to 33%. (17,18,19) We reported that 52.1% of women who did not have an ECV attempt, were not offered one. This corresponds to 19.7% of all eligible women (773/3,926). The number of clients refusing ECV in other studies ranged between 20% to 30%. We reported that 45.2% of women not undergoing ECV declined the treatment, which corresponds to 17.1% of all eligible women (671/3,926).

The detailed information on reasons why ECV was not provided, and which hospital characteristics are related to better ECV implementation rates provide valuable information to improve care for breech presentation. Although prevalence of breech presentation in a general population is low, only 3-4% of term pregnancies, they represent 33.2% of the planned CS in singleton pregnancies at term in the Netherlands in 2012 (3,258 of 9,811 CS). A limitation of this study is the retrospective data collection. Because there is no official registry of ECV attempts, we used data from women with a breech presentation at delivery. Therefore, data on women with a spontaneous version from breech to cephalic presentation and those who delivered in cephalic presentation after a successful ECV are lacking. The average success rate of ECV in the Netherlands is around 40%, thus the 2,443 women with an ECV attempt and breech presentation at birth included in this study probably represent 60% of all women with an ECV attempt. After adjusting for this selection bias, the actual ECV implementation rate is estimated to be around 73%.
CONCLUSIONS

ECV implementation rates vary widely among hospitals. Especially in hospitals with low implementation rates, improvement is urgently needed to reduce the number of planned CS for singleton (breech presenting) pregnancies at term. Suboptimal implementation is mostly caused by care providers who do not offer ECV to eligible women and secondly due to women not opting for the offered ECV attempt. Follow-up studies should focus on the exact reasons for not offering ECV. A detailed understanding of these reasons is a prerequisite for designing implementation strategies that can achieve real change.
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