Improving management of breech presentation at term

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Contraindications for external cephalic version in breech position at term: a systematic review

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ABSTRACT

Objective External cephalic version (ECV) is a safe and effective intervention that can prevent breech delivery, thus reducing the need for cesarean delivery. It is recommended in national guidelines. These guidelines also mention contraindications for ECV, and thereby restrict the application of ECV. We assessed whether the formulation of these contraindications in guidelines are based on empiric data.

Design Systematic review.

Population Pregnant women with a singleton breech presentation from 34 weeks.

Methods We searched the National Guideline Clearinghouse, the Cochrane Central Register of Controlled Trials, MEDLINE (1953-2009), EMBASE (1980-2009), TRIP database (until 2011), NHS (National Health Services, until 2011), Diseases database (until 2011) and NICE guidelines (until 2011) for existing guidelines on ECV and studied the reproducibility of the contraindications stated in the guidelines. Furthermore, we systematically reviewed the literature for contraindications and evidence on these contraindications.

Main outcome measures Contraindications of ECV.

Results We found five guidelines mentioning 18 contraindications, varying from five to 13 per guideline. The contraindications were not reproducible between the guidelines with oligohydramnios as the only contraindication mentioned in all guidelines. The literature search yielded 60 studies reporting on 39 different contraindications, of which we could only assess evidence of six of them.

Conclusions The present study shows that there is no general consensus on the eligibility of patients for ECV. Therefore we propose to limit contraindications for ECV to clear empirical evidence or to those with a clear pathophysiological relevance.
INTRODUCTION

Breech position of a singleton fetus at term occurs in 3–4% of all term pregnancies, and it imposes an increased risk during delivery for mother and child. Nowadays, about 80–96% of all women with a fetus in breech position opt for a planned cesarean section (CS) as this is the safest way to deliver their child.\textsuperscript{1–3}

External cephalic version (ECV) at or near term is a safe procedure that effectively reduces the risk of a CS in pregnancies with breech presentation.\textsuperscript{4,5} International guidelines recommend that all women with an uncomplicated breech pregnancy at term should be offered an ECV.\textsuperscript{6–10} These guidelines also mention contraindications for ECV, restricting the application. Contraindications for ECV are often based on the safety of the procedure, but also on the fact that the probability of success of ECV in the presence of such contraindications is low.

Prediction models on ECV success rates show us that the outcome is multifactorial and that the presence of one negative prognostic factor should not be a reason to withhold ECV.\textsuperscript{11} Therefore, excluding patients from ECV in the presence of only one clinical factor that could affect its success rate is not desirable. ECV contraindications should therefore be limited to factors affecting the safety of the procedure.

Considering the fact that ECV is an important obstetric intervention to prevent breech presentation there should be consensus on women considered eligible for the procedure. Therefore, the primary goal of this study was to systematically assess whether the formulation of contraindications for ECV in guidelines is consistent and based on empirical data. Hence, we assessed the reproducibility of the contraindications for the different guidelines and we systematically reviewed the literature on contraindications and the evidence for each contraindication. A secondary goal is to make recommendations for ECV contraindications based on this systematic review.
MATERIAL AND METHODS

Guidelines

To identify all guidelines, we searched the National Guideline Clearinghouse, the Cochrane Central Register of Controlled Trials, MEDLINE (1953–2009), EMBASE (1980–2009), TRIP database (until 2011), NHS (National Health Services) (until 2011), Diseases database (until 2011) and NICE (until 2011) using a search strategy with keywords: ‘version fetal’, ‘cephalic version’, ‘external version’ and ‘contraindications’.

Literature

We searched the databases UpToDate, PubMed, The Cochrane Central Register of Controlled Trials, MEDLINE (1953–2011), EMBASE (1980–2011) and the Web of Science (until 2011) for studies reporting on ECV and cited contraindications. Furthermore, we analysed the evidence for each contraindication. References from identified publications were manually searched to identify additional relevant articles. No time or language restrictions were applied. In this review, all studies reporting on ECV in the case of a singleton pregnancy from 36 weeks without a contraindication for vaginal delivery were selected. We included guidelines, case reports, randomized controlled trials and case-control studies.

Studies were selected in a two-stage process. First, two reviewers (A.G., A.R.) scrutinized the titles and abstracts of all references possibly reporting on contraindications for ECV. For all studies that were selected by at least one of the reviewers, full manuscripts were obtained. Secondly, final in-/exclusion decisions were made after independent and duplicate examination of the full manuscripts of selected references by two reviewers. For each included article, data on clinical and methodological study characteristics were extracted independently by two reviewers on piloted data-extraction forms. Any disagreements were resolved by consensus and, if necessary, by a third reviewer (M.K.).

From the included studies reporting on ECV, we extracted a list of all contraindications mentioned in the studies. We classified the contraindications in three predetermined categories: maternal factors, fetal factors and other factors. Maternal factors were defined as contraindications that can affect the safety of the mother or affect the procedure of ECV by maternal charac-
teristics. Fetal factors were defined as contraindications that can affect the safety of the fetus or affect the procedure of ECV by fetal characteristics.

Table 1. Overview of the potential contraindications for external cephalic version in the five international guidelines.

<table>
<thead>
<tr>
<th>Contraindications</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NVOG¹</td>
</tr>
<tr>
<td>1. Oligohydramnios</td>
<td>+</td>
</tr>
<tr>
<td>2. Fetal growth restriction</td>
<td>−</td>
</tr>
<tr>
<td>3. Uterine anomaly</td>
<td>+</td>
</tr>
<tr>
<td>4. Ruptured membranes</td>
<td>+</td>
</tr>
<tr>
<td>5. Abnormal CTG</td>
<td>+</td>
</tr>
<tr>
<td>6. Preeclampsia, hypertension</td>
<td>−</td>
</tr>
<tr>
<td>7. Fetal anomaly</td>
<td>−</td>
</tr>
<tr>
<td>8. Antepartum bleeding</td>
<td>−</td>
</tr>
<tr>
<td>9. History of placental abruption</td>
<td>+</td>
</tr>
<tr>
<td>10. Second trimester bleeding</td>
<td>−</td>
</tr>
<tr>
<td>11. Hyperextension fetal head</td>
<td>−</td>
</tr>
<tr>
<td>12. Maternal cardiac disease</td>
<td>−</td>
</tr>
<tr>
<td>13. Macrosomia &gt;4000 g</td>
<td>−</td>
</tr>
<tr>
<td>14. Maternal obesity</td>
<td>−</td>
</tr>
<tr>
<td>15. Two or more CS in history</td>
<td>−</td>
</tr>
<tr>
<td>16. Active labor</td>
<td>−</td>
</tr>
<tr>
<td>17. Unstable lie</td>
<td>−</td>
</tr>
<tr>
<td>18. Restrictive nuchal cord</td>
<td>−</td>
</tr>
<tr>
<td>No. of contraindications per guideline</td>
<td>5</td>
</tr>
</tbody>
</table>

¹NVOG Dutch Society of Obstetrics and Gynecology.
²KNOV Royal Dutch Organization of Midwives.
³ACOG American College of Obstetricians and Gynecologists.
⁴RCOG Royal College of Obstetricians and Gynaecologists.
⁵RANZCOG Royal Australian New Zealand College of Obstetricians and Gynaecologists.
RESULTS

Guidelines

The electronic search yielded three international guidelines on ECV.\textsuperscript{7–9} Furthermore, there are two Dutch guidelines on the topic.\textsuperscript{6,10} These five guidelines reported on 18 different contraindications varying from five to 13 contraindications per guideline (Table 1).

Literature

We detected 890 studies on ECV, of which 261 were retrieved for complete assessment after reading the title or abstract. Of the 261 primary articles, 201 were excluded after further research: 199 articles because no contraindications were mentioned and two articles which were unobtainable. The 60 articles that were finally included in the systematic review reported on 39 different contraindications for ECV. Forty-three studies (72\%) were designed as a cohort study, six (10\%) as case-control studies and 11 (18\%) as randomized controlled trials. \textbf{Table 2 shows all 39 contraindications categorized by the three predetermined categories: maternal factors, fetal factors and other factors.} For each contraindication we performed a literature search to determine whether it was an evidence-based contraindication.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|}
\hline
\textbf{Guidelines} & \textbf{Maternal factors} & \textbf{Fetal factors} & \textbf{Other factors} \\
\hline
\textbf{(no. of guidelines)} & Uterine anomaly (4) & Fetal growth restriction (4) & Oligohydramnios (5) \\
\hline
 & Preeclampsia/ hypertension (3) & Abnormal CTG (3) & Restrictive nuchal cord (1) \\
\hline
 & Ruptured membranes (3) & Fetal anomaly (3) & \\
\hline
 & Antepartum bleeding (3) & Macrosomia >4000 g (1) & \\
\hline
 & Second trimester bleeding (2) & Hyperextension fetal head (1) & \\
\hline
 & Abruption placenta in history (2) & Unstable lie (1) & \\
\hline
 & Active labor (1) & \\
\hline
 & Maternal cardiac disease (1) & \\
\hline
 & Maternal obesity (1) & \\
\hline
\hline
\textbf{Literature} & Maternal problems & Cephalopathy & Inexperienced obstetrician \\
\hline
 & ECG abnormalities & Doppler abnormalities & Anterior placenta \\
\hline
 & Abnormal pelvic & Fetal distress & Polyhydramnios \\
\hline
 & Age >45 years & Positive non stress-test & Single umbilical artery \\
\hline
 & Allergy & Rhesus immunization & \\
\hline
 & CS in history & Uteroplacental transfusion & \\
\hline
 & Diabetic & & \\
\hline
 & Dilated cervix & & \\
\hline
 & Grand multipara & & \\
\hline
 & Hyperthyroidism & & \\
\hline
 & Irregular thyroxin & & \\
\hline
\end{tabular}
\caption{Overview of all contraindications for external cephalic version reported in guidelines and literature.}
\end{table}

\textit{CS, cesarean section; CTG, cardiotocography; ECG, electrocardiogram.}
Maternal factors

We found two cohort studies and one review reporting on ECV in women with a previous CS. The review also included the cohort study of de Meeus et al. The review reported on 166 cases in which one emergency CS was performed with good neonatal outcome. The authors concluded that women with a breech-presenting fetus at term and a previous CS, who desire a trial of labor, should be counselled regarding the accumulating evidence about the efficacy and apparent safety of this procedure and possibly offered an ECV attempt. The prospective cohort study of Abenhaim et al. was published after the review of Sela et al. and did not report on complication rates, but only reported success rate in the 36 women with a scarred uterus (which was similar to success in women without a scarred uterus).

We found two case reports on ECV in the case of premature rupture of the membranes (PROM). The first study reported on one woman who underwent an ECV with ruptured membranes. The ECV was successful, but within two hours after the ECV the umbilical cord prolapsed. The other report concluded that the key indicators for ECV with ruptured membranes might be the absence of labor, normal amniotic fluid index by ultrasound, and a visually closed cervix at the time of the procedure.

We could not find evidence for the other contraindications mentioned in this category; however, some main risks factors are based on clinical physiological knowledge and are therefore discussed. There were no studies reporting on the relationship between ECV and placental abruption; however, it is considered a rare complication of ECV. Considering the seriousness of the complication and the higher risk of recurrence in patients with a history of placental abruption, it seems justified to withhold ECV in patients suspected of an imminent abruption (for example vaginal blood loss) or with a history of abruption.

Fetal factors

We found one meta-analysis on the relationship between the success rate of ECV and estimated fetal weight. Five studies reporting on estimated fetal weight and ECV outcome were included. The weight categories reported on were too heterogeneous to pool results from. Although there were no
adverse events reported for small-for-gestational age foetuses, there was not enough evidence to conclude that ECV is safe in cases of severe growth restriction with Doppler abnormalities.

Other factors

We found three systematic reviews reporting on the relationship between success rate of ECV and oligohydramnios.\textsuperscript{17–19} The studies conclude that an amniotic fluid index (AFI) above 10 cm was associated with an increased chance of success, but did not report any adverse events of ECV in those women with low amniotic fluid index.

This is also the case with an anterior placenta. One systematic review reported the relationship between anterior placenta and a lower success rate of ECV, but in none of the included studies were complications reported in this group of women.

DISCUSSION

Our review of international guidelines showed that there was only a slight agreement on contraindications for ECV between the guidelines, oligohydramnios being the only contraindication mentioned in all guidelines. We summarized the available evidence on potential contraindications for ECV. Of the 39 contraindications for ECV mentioned in the guidelines and literature, we could only assess evidence for six. Five could be rejected based on evidence of systematic reviews (one previous CS, fetal growth restriction, macrosomia, oligohydramnios, polyhydramnios) and one was still debatable due to a low level of evidence (case reports, premature rupture of the membranes). The extensive adherence to contraindications that were not well defined, indicates that ECV may potentially be withheld from a significant proportion of women who could benefit from it without increased risks of adverse events. To our knowledge this is the first review on contraindications for ECV. We conducted this review with a comprehensive search strategy and made a concerted effort to find all the evidence. For each contraindication mentioned in the literature and guidelines, we searched for evidence and thereby exposed gaps in the knowledge about contraindications for ECV. More than three-quarters of the identified contraindications (33 of 39) were not based on any evidence. Publication bias could have influenced the results of our literature search; however, (case) reports on
negative outcomes are more likely to be written down and published compared with reports on cases with good outcomes. Therefore, we think that the chance we have missed adverse outcomes related to suggested contraindications in guidelines and literature is very low. A limitation of this study is the low occurrence rate of complications of ECV, which makes it difficult to prove a (significant) relation between certain patient characteristics and adverse events. A systematic review by Grootscholten et al.\textsuperscript{20} reported on 60 severe adverse outcomes in 12,955 ECVs (0.5\%) from 84 studies. Severe adverse outcomes included stillbirth (20\%), placental abruption (20\%), prolapsed cord (13\%) and abnormal CTG after ECV resulting in emergency CS (47\%). Considering the safety and effectiveness of ECV in preventing cesarean delivery in the case of breech presentation, international agreement on contraindications for ECV is important. According to several international studies, we estimate that worldwide ECV is not offered to about 10–15\% of eligible women.\textsuperscript{21–24} Therefore, we would like to propose a reduced list of three contraindications. This list of recommended contraindications is reported in table 3. (table 3 invoegen) Placental abruption is mentioned as a rare complication of ECV in two articles.\textsuperscript{5,25} Therefore, we think it is justified to withhold ECV from patients with an increased risk of placental abruption (a history of placental abruption and severe preeclampsia or haemolysis elevated liver enzymes low platelets (HELLP) syndrome. Furthermore, we included signs of fetal distress, as distressed foetuses should not be exposed to more stress. The above-mentioned systematic review on complications\textsuperscript{5} reports that ECV can result in (passing) fetal distress, as seen on CTGs afterwards.

**Table 3.** Recommended restriction of contraindications (level of evidence).

<table>
<thead>
<tr>
<th>Maternal factors</th>
<th>Fetal factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placental abruption in history or signs of placental abruption (level III)</td>
<td>Signs of fetal distress (abnormal CTG and or abnormal Doppler flow) (level III)</td>
</tr>
<tr>
<td>Severe preeclampsia or HELLP syndrome (level III)</td>
<td></td>
</tr>
</tbody>
</table>

1. Level I: Evidence obtained from at least one properly designed randomized controlled trial.
2. Level II-1: Evidence obtained from well-designed controlled trials without randomization.
3. Level II-2: Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group.
4. Level II-3: Evidence obtained from multiple time series with or without the intervention.
5. Dramatic results in uncontrolled trials might also be regarded as providing this type of evidence.
6. Level III: Opinions of respected authorities, based on clinical experience, descriptive studies or reports of expert committees.
7. CTG, cardiotocography; HELLP, haemolysis elevated liver enzymes low platelets.
REFERENCES


Chapter 4 Contraindications for external cephalic version in breech position at term


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