**Intrapartum cesarean delivery after successful external cephalic version: a meta-analysis**

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**CRD summary**
This review assessed the effect of successful external cephalic version on intrapartum Caesarean delivery. The authors concluded that the risk of Caesarean delivery after successful version was about twice that of spontaneous cephalic-presenting pregnancies. This was generally a well-conducted review, but the reliance upon observational studies weakens the evidence.

**Authors' objectives**
To determine if the risk of intrapartum Caesarean delivery was higher in pregnancies with successful external cephalic version compared with spontaneous cephalic-presenting pregnancies.

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**Searching**
MEDLINE and EMBASE were searched; the search terms were stated. The Cochrane Library was also searched and reference lists of articles and reviews were screened. Abstracts of the American College of Obstetricians and Gynecologists Annual Clinical Meeting (1999 to 2002) and the Society for Maternal-Fetal Medicine Annual Meeting (1996 to 2002) were examined to identify relevant unpublished data. Only studies published in the English language between 1980 and 2002 were included.

**Study selection**

- **Study designs of evaluations included in the review**
Prospective and retrospective cohort studies were eligible for inclusion.

- **Specific interventions included in the review**
Studies that compared pregnancies after successful external cephalic version, performed at or after 36 completed weeks of pregnancy, with spontaneous cephalic-presenting pregnancies were eligible for inclusion.

- **Participants included in the review**
Women with singleton pregnancies were eligible for inclusion.

- **Outcomes assessed in the review**
Studies that assessed mode of delivery were eligible for inclusion. The review assessed Caesarean section performed for any cause, dystocia and foetal distress.

**How were decisions on the relevance of primary studies made?**
Two reviewers independently selected studies and any disagreements were resolved with the help of a third reviewer.

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**Assessment of study quality**
The authors did not state that they assessed validity.

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**Data extraction**
Two reviewers independently extracted the data using a standardised data extraction form. The extracted data included the numbers of patients in the study and control groups, the number of Caesarean sections (estimated if necessary from reported percentages) and the indication for Caesarean delivery.

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**Methods of synthesis**
How were the studies combined?
Pooled relative risks (RRs) with 95% confidence intervals (CIs) were calculated using a random-effects model when statistically significant heterogeneity (P<0.10) was present, or a fixed-effect model otherwise. The possibility of publication bias was explored using a funnel plot and was tested using Egger's test.

How were differences between studies investigated?
Statistical heterogeneity was assessed using the chi-squared statistic. Where statistically significant heterogeneity was found, the study responsible was identified and the meta-analyses repeated after excluding this study. The relationship between study-specific RR and the percentage of Caesarean delivery was examined using a hierarchical regression model. Meta-analyses were also performed separately using data from studies with and without matched controls.

Results of the review
Six cohort studies were included (637 women who had versions plus 36,556 controls). In three studies the controls were matched to cases.

Compared with cephalic-presenting pregnancies, successful version was associated with a significantly increased risk for all-cause Caesarean section (27.6% versus 12.5%; RR 2.04, 95% CI: 1.43, 2.91), Caesarean section for dystocia (RR 2.19, 95% CI: 1.38, 3.48) and Caesarean section for foetal distress (RR 2.10, 95% CI: 1.18, 3.75).

The increased risk of Caesarean section was statistically significant for studies with and without matched controls (the data were not presented).

The funnel plot showed no evidence for publication bias (P=0.263).

Statistically significant heterogeneity was found and attributed to one study with a high rate of Caesarean section in the control group. After excluding this study, the increased risk of Caesarean section was still statistically significant for all-cause Caesarean section (RR 2.62, 95% CI: 2.27, 3.03), Caesarean section for dystocia (RR 2.80, 95% CI: 2.20, 3.56) and Caesarean section for foetal distress (RR 2.80, 95% CI: 2.01, 3.90). Heterogeneity was no longer statistically significant for any of the meta-analyses (P>0.32).

Authors' conclusions
The risk of intrapartum Caesarean section delivery after successful version was about twice that of spontaneous cephalic-presenting pregnancies.

CRD commentary
The review question was clear in terms of the study design, participants, intervention and outcomes. Several relevant sources were searched and attempts were made to locate unpublished studies, thus limiting the possibility of publication bias. Appropriate methods were used to assess the presence of publication bias, but no evidence for it was found. No attempts were made to minimise language bias. Two reviewers independently selected studies and extracted the data, thus reducing the potential for bias and errors.

Adequate information on the included studies was given. The studies were combined in a meta-analysis and, when statistically significant heterogeneity was found, the study responsible was identified and the differences between this study and the others were examined. Studies with matched controls were analysed separately from those without matched controls. This was generally a well-conducted review, but the reliance upon observational studies does weaken the evidence.

Implications of the review for practice and research
Practice: The authors stated that women with breech-presenting pregnancies should be informed about the increased risk of Caesarean section after successful version. They also stated that pregnancies after successful version should not be viewed as normal pregnancies.
Research: The authors stated that future studies should attempt to determine why women have an increased Caesarean section rate after successful version compared with cephalic-presenting pregnancies. They suggested that the stress response of breech foetuses and mechanical factors should be some of the variables examined.

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