Cesarean delivery for twins: a systematic review and meta-analysis

CRD summary
This review assessed whether a policy of planned Caesarean or vaginal delivery was better for twins. Planned Caesarean section might decrease the risk of a low 5-minute Apgar score, particularly if twin A is breech. The conclusions follow from the evidence presented, but are limited by a lack of robust evidence and methodological weaknesses in the conduct of the review.

Authors' objectives
To determine whether a policy of planned Caesarean or vaginal delivery was better for twins.

Searching
MEDLINE and EMBASE were searched from 1980 to May 2001 using a range of keywords detailed in the report. The authors also searched the Cochrane Controlled Trials Register and checked the reference lists of all extracted articles. No attempts to search for unpublished material were made.

Study selection
Study designs of evaluations included in the review
Retrospective and prospective cohort studies and randomised controlled trials (RCTs) were eligible for inclusion in the review.

Specific interventions included in the review
Studies that compared planned Caesarean section with planned vaginal birth were eligible for inclusion in the review. Planned Caesarean sections included those performed before labour or shortly after labour begun, as well as those performed for reasons other than twins, such as placenta previa and hypertension. Planned vaginal births included all births occurring after a trial of labour, irrespective of whether they were delivered vaginally or by emergency Caesarean.

Participants included in the review
Studies were included if they considered twin pregnancies that had reached at least 32 weeks' gestation, or if both babies weighed at least 1,500g. The studies examined breech first twins (1 study), twins of all presentations (1 study), vertex/nonvertex twins weighing at least 1,500g (1 study) and vertex/nonvertex twins with an estimated gestational age of 35 to 42 weeks (1 study).

Outcomes assessed in the review
The inclusion criteria for the outcomes do not appear to have been pre-specified. The included outcomes were perinatal or neonatal mortality, low 5-minute Apgar score, neonatal morbidity and maternal morbidity.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity. [A: Studies with a higher likelihood of selection bias (lower quality) were excluded. For example, if the analysis was not presented according to the intended mode of delivery i.e. intention-to-treat the study was excluded. Rather than giving a validity score to each study, the authors reported descriptively on biases identified. Three individuals abstracted the quality data.]
Data extraction
Three reviewers independently extracted the data and resolved any discrepancies by consensus. Where the studies included data for babies born before 32 weeks or weighing less than 1,500g, these were omitted; the data were extracted only for those twins weighing at least 1,500g or born at 32 or more weeks of gestation.

Methods of synthesis
How were the studies combined?
The studies were combined using meta-analysis techniques. For each outcome of interest a pooled odds ratio (OR) was calculated using the Mantel-Haenszel method.

How were differences between studies investigated?
Differences in the clinical populations were discussed within the text of the report and a statistical test of heterogeneity was performed. Subgroup analyses were performed for twin A breech, vertex/vertex and vertex/nonvertex twins.

Results of the review
Four studies with a total of 1,932 infants were included in the review. The RCT had 120 infants, while the three retrospective cohorts comprised 1,812 infants.

A low 5-minute Apgar score occurred less frequently in twins delivered by planned Caesarean section than by planned vaginal delivery (OR 0.47, 95% confidence interval, CI: 0.26, 0.88). There was significant heterogeneity in the pooled results (P=0.03). Twins with twin A presenting as breech were less likely to have a low 5-minute Apgar score if they had a planned Caesarean section (OR 0.33, 95% CI: 0.17, 0.65). Based on one study, twins delivered by planned Caesarean section spent significantly longer in the hospital (mean difference 4.01 days, 95% CI: 0.73, 7.28). There were no statistically-significant differences between the intervention groups in terms of perinatal or neonatal mortality, neonatal morbidity or maternal morbidity.

Authors' conclusions
Planned Caesarean section might decrease the risk of a low 5-minute Apgar score, particularly if twin A is breech. The authors maintained that, apart from this, there was no evidence to support planned Caesarean section for twins.

CRD commentary
The review had a stated objective with inclusion criteria for the participants, interventions and study designs. The inclusion criteria for the outcomes do not appear to have been pre-specified. The literature search covered a range of sources but did not include unpublished studies, thus potentially missing research. The validity of the included studies does not appear to have been considered; this is all the more important when including retrospective cohort studies, which are more susceptible to bias. It is not usual to pool RCTs and cohort studies since these generally have varying levels of reliability, thus affecting the overall estimate of effect. It was unclear whether certain aspects of the review process, such as decisions on the relevance of studies, were carried out by more than one reviewer. Should this have not been the case, there is the potential for introducing bias into the review.

The authors’ conclusions were broadly supported by their results, but the subgroup analyses were likely to have been underpowered to detect significant effects. Given these limitations, and limitations within the review process itself, the review is perhaps most useful in pointing to the need for a large RCT to fully understand the benefits and risks of modes of delivering twins.

Implications of the review for practice and research
Practice: The authors stated that this review supported the recommendation that planned Caesarean section is appropriate for twins when twin A is breech.

Research: The authors recommended the design of an appropriately sized RCT to determine the best approach for
delivering twins.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.