Fetal abdominal wall defects and mode of delivery: a systematic review
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Authors' objectives
To determine whether there is sufficient evidence to support Caesarean delivery over vaginal delivery in women carrying a foetus with an abdominal wall defect.

Searching
MEDLINE was searched from 1966 to June 2000 using the MeSH terms 'gastroschisis', 'omphalocele' and 'fetal abdominal wall defects'. The search was restricted to peer-reviewed studies published in the English language. The references of the retrieved studies and standard obstetrics textbooks were checked for additional articles.

Study selection
Study designs of evaluations included in the review
Studies were excluded if they were a case series. The included studies were prospective cohort, observational studies. No randomised controlled trials were found.

Specific interventions included in the review
Comparisons of Caesarean delivery (elective and following labour) and vaginal delivery were eligible for inclusion.

Participants included in the review
Foetuses with an abdominal wall defect (gastroschisis and omphalocele) were eligible for inclusion.

Outcomes assessed in the review
To be included, the studies had to report neonatal outcomes for time until initiation of enteral feedings, speed of bowel recovery, length of hospital stay, and mortality.

How were decisions on the relevance of primary studies made?
Two of the authors independently reviewed the papers for inclusion. The authors then met to discuss inclusion or exclusion agreements.

Assessment of study quality
The authors did not perform any standardised quality evaluation but have described the quality of the studies using the U.S. Preventive Task Force guidelines (see Other Publications of Related Interest).

Data extraction
One reviewer extracted the data.

Data were extracted for the following categories: study identification; years covered by the study; study origin (country); quality score; the number of participants; the number of participants with diagnosis made prenatally; the number inborn; the number with gastroschisis; the number with omphalocele; the number of Caesarean deliveries; the number of vaginal deliveries; whether primary repair was reported; and whether ischaemic bowel, small bowel obstruction, necrotising enterocolitis, sepsis, or mortality were reported.

The authors also extracted data on differences in the presence of ischemic bowel, small bowel obstruction, necrotising enterocolitis, and sepsis between the two groups, in order to provide insight into the post-operative period and its complications.
Methods of synthesis
How were the studies combined?
Dichotomous data: pooled estimates of the odds ratio were calculated using both random-effects and fixed-effect models, and were expressed as relative risks (RR) with 95% confidence intervals (CIs).

Continuous data: the pooled standard differences of the means were calculated using a random-effects model, and were expressed as RRs with 95% CIs.

How were differences between studies investigated?
A Q-statistic was calculated to examine the inter-study heterogeneity for individual outcomes.

Results of the review
Fifteen prospective cohort studies, with 805 fetuses as participants, were included in the review. Overall, 39% of the abdominal wall defects were diagnosed prenatally. It was not possible to determine whether prenatal diagnosis occurred more often in those who had a Caesarean delivery, compared with those who delivered vaginally.

Dichotomous outcomes.
Caesarean section did not appear to confer any benefit compared with vaginal delivery for any of the dichotomous outcomes. For the relationship between mode of delivery and primary fascial repair, the RR was 1.20 (95% CI: 1.04, 1.39) when using the fixed-effect model and 1.22 (95% CI: 0.99, 1.51; Q=0.09) when using the random-effects model. There was no statistically significant relationship between neonatal sepsis or paediatric mortality. In addition, the presence of ischaemic bowel (RR 0.8, 95% CI: 0.05, 11.75; Q=0.25), small bowel obstruction (RR 0.61, 95% CI: 0.07, 5.06; Q=0.06), and necrotising enterocolitis (RR 1.27, 95% CI: 0.35, 4.58; Q=0.31) were also unrelated to the mode of delivery.

Continuous outcomes.
There were no differences between infants who delivered by Caesarean section and those who delivered vaginally, for time until initiation of enteral feeding (RR -0.12, 95% CI: -0.42, 0.16; Q=0.43) or length of hospital stay (RR -0.16, 95% CI: -0.45, 0.23; Q=0.10).

Authors’ conclusions
The results of this meta-analysis did not support improved neonatal outcomes for infants with abdominal wall defects delivered by Caesarean section, compared with those delivered vaginally. Given the quantifiable increase in the maternal morbidity with Caesarean delivery in comparison with vaginal delivery, and the uncertain benefits of Caesarean delivery, the authors support that women carrying a foetus with an abdominal wall defect should be delivered vaginally; Caesarean delivery should be reserved for unusual obstetric indications.

CRD commentary
The authors have stated their research question and the inclusion and exclusion criteria. The literature search was limited in that only one major database was searched and no unpublished data were sought. The search was also restricted to English publications. There was no assessment of possible publication bias. The authors reported who and how many of the authors performed the study selection and data extraction processes, but have not reported who performed the quality assessment.

The statistical pooling used appropriate methods for both binary and continuous data, and employed both fixed-effect and random-effects models; both sets of results were reported. Heterogeneity was assessed, and while the results determined that the random-effects model was used in some instances, the results from both models were reported in the review. The authors acknowledge that the results were based on data from observational studies rather than randomised controlled trials, and that potentially important confounding factors might be present.
The conclusions appear to follow from the results, but should be viewed with caution given the lower reliability associated with the included study designs.

**Implications of the review for practice and research**

Practice: The authors support the use of vaginal delivery for women carrying a foetus with an abdominal wall defect, and that Caesarean delivery should be reserved for unusual obstetric indications.

Research: The authors state that a randomised trial comparing elective Caesarean delivery with vaginal delivery needs to be performed in order to answer this review question.

**Bibliographic details**


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**Other publications of related interest**


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