The effect of routine early amniotomy on spontaneous labor: a meta-analysis

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Authors' objectives
To obtain estimates of the effects of amniotomy on the risk of Caesarean delivery, and on other indicators of maternal and neonatal morbidity.

Searching
MEDLINE and the Cochrane Pregnancy and Childbirth Database were searched for published studies. Further computerised and manual searches of unpublished reports were conducted by a librarian at the National Research Council of Canada.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) achieving a minimum quality score were included.

Specific interventions included in the review
Routine amniotomy compared with an attempt to conserve the membranes.

Participants included in the review
Multi- and nulliparas women in labour were included.

Outcomes assessed in the review
Labour duration; risk of Caesarean delivery; perception of pain in labour; neonatal morbidity (including Apgar score less than 7 at 5 minutes, admission to neonatal intensive unit, meconium aspiration syndrome, jaundice, infection requiring antibiotics, resuscitation and convulsions).

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

Assessment of study quality
The validity of the studies was assessed using an adaptation of the methods described by Chalmers et al. (see Other Publications of Related Interest no.1). Three main areas were assessed: trial methodology (60% of total score), quality of presentation of results (10% of total score), and approach to analysis (30% of total score). A score of at least 50% was considered acceptable. All trials were evaluated by two independent reviewers using an adaptation of the quality assessment instrument developed by Chalmers et al. (see Other Publications of Related Interest no.1).

Data extraction
All trials were evaluated by two independent reviewers. As far as possible, reviewers were blinded to authorship of articles and the journals in which they were published. Disagreements were resolved by consensus.

Methods of synthesis
How were the studies combined?
For each outcome, within individual studies, odds ratios (ORs) and their 95% confidence intervals (CIs) were calculated using the method of Yusuf et al. (see Other Publications of Related Interest no.2). A summary estimate was then calculated for each outcome measure, unless there was significant heterogeneity.
How were differences between studies investigated?
A chi-squared test of homogeneity was used to assess the consistency of treatment effects across trials for each outcome.

Results of the review
Seven RCTs (n=3,098) were included, whilst 3 other trials were excluded due to methodological limitations.

Quality scores for the included studies ranged from 53.26 to 91.04%.

Homogeneity tests for the estimates of the effects for the major outcomes of interest revealed non statistically-significant differences, with the exception of the use of oxytocin (p=0.007).

All 7 trials reported a shortening of labour duration in association with amniotomy. The magnitude of reduction was 0.6 to 2.3 hours.

Six trials provided sufficient information on the risk of Caesarean delivery. The results show a trend towards an increased risk of Caesarean delivery associated with a policy of early amniotomy (OR 1.21, 95% CI: 0.91, 1.61). This difference was not statistically significant.

There was no evidence of an effect of amniotomy on the likelihood of operative vaginal delivery (OR 1.0, 95% CI: 0.8, 1.2), use of analgesics (OR 1.2, 95% CI: 0.9, 1.5) or epidural analgesics (OR 0.9, 95% CI: 0.8, 1.1). A reduction in oxytocin use was observed in 4 of the 5 trials reporting this outcome.

A policy of early amniotomy was associated with a statistically-significant reduction in the likelihood of an Apgar score greater than 7 at 5 minutes. However, there was no evidence for an effect on any other indicators of neonatal morbidity.

Maternal perception of pain was assessed in 3 trials. A policy of early amniotomy was associated with a reduction in the proportion of women reporting the most severe level of pain at some point in labour (OR 0.60, 95% CI: 0.76, 0.97).

Three trials assessed mothers’ views on their labour and childbirth experience. The results of the meta-analysis did not indicate that the policy of amniotomy is associated with maternal satisfaction with labour (OR 1.2, 95% CI: 0.9, 1.5).

Authors’ conclusions
Routine amniotomy is associated with both benefits and risks. Benefits include a reduction in labour duration and a possible reduction in abnormal 5-minute Apgar scores. This meta-analysis provides no support for the hypothesis that routine early amniotomy reduces the risk of Caesarean delivery. An association between early amniotomy and Caesarean delivery for foetal distress was noted in one large trial, suggesting that amniotomy should be reserved for patients with abnormal labour progress.

CRD commentary
A clear, well-documented systematic review. More detail of the search strategy, including search terms and years covered, would have enhanced the review.

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