Active management of labor: a meta-analysis of Cesarean delivery rates for dystocia in nulliparas

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Authors' objectives
To determine through a meta-analysis of the published literature, whether active management of labour lowers the Caesarean delivery rate for dystocia (difficult or ineffective labour) in nulliparas.

Searching
MEDLINE was searched back to 1966 for reports in the English language, using the following keywords: 'active management', 'labor', 'oxytocin', 'augmentation' and 'dystocia'. Additional publications were obtained by examining the references of these studies. Abstracts and unpublished results were not sought.

Study selection
Study designs of evaluations included in the review
Studies with a control group were included. These had to adhere to at least four of the five tenets of active management, provide a detailed description of patient selection and analysis, and provide numerical data on Caesarean deliveries for dystocia in nulliparas.

Specific interventions included in the review
The active management of labour, i.e. adherence to at least four of the following: definition of labour, early amniotomy, early oxytocin, rapid increase in oxytocin rate, one-to-one labour support.

Participants included in the review
Nulliparas who experienced dystocia were included.

Outcomes assessed in the review
Caesarean rates for dystocia were assessed.

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
A modification of the quality scoring system by Chalmers et al. (see Other Publications of Related Interest no.1) was used to rate each included study; the results were shown in an appendix to the paper. The highest possible score was 60 to 63, depending upon the applicable criteria. Both authors separately ranked each study and consensus was attained. One of the authors was blinded to the study authors, institutions, journals, and discussion sections.

Data extraction
Both authors independently abstracted data (based on intention to treat) from the selected studies of Caesarean deliveries performed on nulliparas for dysocia onto 2x2 tables. One of the authors was blinded to the study authors, journal, institution, and conclusions. Any differences were resolved by consensus.

Methods of synthesis
How were the studies combined?
The Mantel-Haenszel method was used to give inverse variance-weighted odd ratios (ORs), whilst serial fixed-effect
analyses of the reports yielded summary ‘typical’ ORs. The 95% confidence intervals (CIs) for Caesarean rates were also calculated.

How were differences between studies investigated?
The Mantel-Haenszel Q statistic was used to evaluate the homogeneity of treatment effects. The authors calculated variance using the method of Robins et al. (see Other Publications of Related Interest no.2) Randomised and non-randomised studies were also analysed separately.

Results of the review
Two prospective randomised controlled trials (RCTs), and 3 non-randomised trials with historical controls. There were 5,324 participants in the actively-managed group and 4,973 participants in the control group.

The summary OR for all five studies was 0.61 (95% CI: 0.50, 0.75). However, there was significant heterogeneity in the studies (Q=11.8, d.f.=4, P=0.019). The OR for the two RCTs was 0.81 (95% CI: 0.58, 1.12).

Cost information
Active management of labour has the potential to decrease the total Caesarean delivery rate in the USA by 13%, or approximately 120,000 surgical deliveries per year, with a potential yearly cost-saving of up to $500 million.

Authors’ conclusions
Based on the results of this meta-analysis, active management of labour seems to lower the odds of undergoing Caesarean for dystocia by 34%, without compromising foetal status.

A 39% decrease in the OR for Caesarean birth for dystocia in nulliparas was evident when all five included studies were combined. However, significant heterogeneity indicates variance of treatment effects. The summary OR for these five reports largely reflected the contribution of the three non-randomised trials; inclusion of only the two RCTs resulted in a trend towards a decrease in the summary OR, which did not meet statistical significance (P<0.05).

CRD commentary
The authors searched MEDLINE electronically, and the reference lists of the identified studies by hand for additional studies. Since they limited themselves to English language studies, it is therefore unclear how many relevant studies may have been excluded. The inclusion and exclusion criteria were described well, and the authors assessed each included study. The included studies were described, and the synthesis of the five included studies was discussed comprehensively.

The review focused primarily on studies from the United States, which has a higher rate for Casarean delivery than elsewhere.

In summary, the main findings should be treated with caution as RCTs were combined with studies with historical controls. In the analysis which included only the two RCTs, there were no statistically-significant differences in Caesarean rate between the actively-managed group and the control group.

Bibliographic details

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Other publications of related interest

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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.