Induction of labor versus expectant management for post-date pregnancy: is there sufficient evidence for a change in clinical practice?

Wennerholm U B, Hagberg H, Brorsson B, Bergh C

CRD summary
This generally well-conducted review concluded that elective induction of labour was associated with a lower rate of meconium aspiration syndrome and caesarean section, but not a lower risk of perinatal mortality, when compared with expectant management for post-date pregnancy. Some caution might be required in interpreting these conclusions because of the poor quality of most of the included trials.

Authors' objectives
To compare elective induction of labour with expectant management for post-date pregnancies.

Searching
PubMed, CINAHL, DARE, PsycINFO and Cochrane Database of Systematic Reviews were searched from 1980 to November 2007. Search terms were reported. Reference lists of retrieved publications were screened. Abstracts and studies published in languages other than English were excluded.

Study selection
Randomised controlled trials (RCTs) that compared elective induction of labour with expectant management in women at 41 weeks gestation or more were eligible for inclusion. Studies published before 1980 (when ultrasound was introduced) were excluded. Eligible outcomes were: perinatal death; intrauterine fetal death; early neonatal death; asphyxia; an Apgar score of less than 7 at five minutes; meconium aspiration; admission to neonatal intensive care unit; birth weight; caesarean section; assisted vaginal delivery; perineal injury; postpartum haemorrhage; and maternal satisfaction. The primary review outcome was perinatal mortality.

The methods of elective induction of labour differed in the included studies. The definition of post-date pregnancy in included studies ranged from 287 to 294 days. The included studies originated from Norway, China, Thailand, Turkey, Canada, India, Hong Kong and United States. The control group was monitored using the following methods: non-stress test; fetal kick counts; atropine test; ultrasound; urinary estriol; biophysical profile; and amniotic fluid index. The age of the women was not reported.

The authors stated neither how the papers were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
The quality of studies was assessed using the JAMA validity score (which scores to a maximum of 5), Swedish Council on Technology Assessment in Healthcare and the CONSORT checklist (Consolidated Standards of Reporting Trials checklist). The criteria of internal validity included randomisation, comparability of groups, blinding, compliance, loss to follow-up, evaluation of outcomes and adverse events, intention to treat analysis and the study power. The external validity of studies were evaluated. A quality rating of high, fair or poor was given for each study.

Three reviewers independently performed the validity assessment. Disagreements were resolved by discussion.

Data extraction
The authors extracted data on the outcomes of interest. It appeared that the authors estimated relative risks for dichotomous outcomes and mean differences for continuous outcomes, both with 95% confidence intervals (CIs).

Two reviewers performed the data extraction. Any disagreements were resolved by discussion.
Methods of synthesis
The studies were combined in meta-analyses, using a fixed-effects model in the absence of statistical heterogeneity. Pooled relative risks with 95% CIs were calculated for dichotomous outcomes. Weighted mean differences with 95% CIs were estimated for continuous outcomes. Statistical heterogeneity was investigated using \( \chi^2 \) and \( I^2 \) statistics. Sensitivity analysis was conducted to assess the influence of the largest RCT because of different induction management between the intervention and control groups. Publication bias was visualised using funnel plots. Subgroup analyses were conducted based on gestational age.

Results of the review
Thirteen RCTs (n=6,708) were included in the meta-analysis. Sample size varied from 22 to 3,407. Three RCTs were judged as fair quality and 10 were judged as poor quality.

Pooled analysis:
When the studies were pooled, elective induction of labour was associated with a non-significant difference in perinatal mortality compared with expectant management for post-date pregnancy (relative risk 0.33, 95% CI: 0.10 to 1.09, \( p=0.07 \); 11 RCTs). Elective induction of labour was associated with a significant reduction in meconium aspiration syndrome (relative risk 0.43, 95% CI: 0.23 to 0.79, \( p=0.007 \); seven RCTs), a significantly lower mean birth weight (weighted mean difference -44.41, 95% CI: -79.37 to -9.45, \( p=0.01 \); eight RCTs) and a significant reduction in caesarean section (relative risk 0.87, 95% CI: 0.80 to 0.96; \( p=0.004 \); 13 RCTs). There were no statistical differences in other outcomes for the two groups.

Subgroup analyses:
Elective induction of labor in the 41-week group was associated with a significant reduction in meconium aspiration syndrome (relative risk 0.35, 95%CI: 0.16 to 0.75, \( p=0.007 \); five RCTs) and a significant reduction in caesarean section (relative risk 0.87, 95% CI: 0.79 to 0.96, \( p=0.006 \); nine RCTs). In the 42-week group, elective induction of labour was associated with a significant lower mean birth weight compared with expectant management (weighted mean difference -101.58, 95% CI: -179.01 to -24.15, \( p=0.01 \); three RCTs).

No statistically significant heterogeneity was observed in the outcomes. Sensitivity analysis altered the result for the outcome of caesarean delivery significantly. The result of assessing publication bias was unreported.

Authors' conclusions
Compared with expectant management for post-date pregnancy, elective induction of labour was associated with a lower rate of meconium aspiration syndrome and caesarean section, but not a lower risk of perinatal mortality.

CRD commentary
This review's inclusion criteria were clear. Several relevant databases were searched. The decision to restrict the review to published studies reported in English may have increased the chances of publication and language biases. Publication bias was evaluated, but the result was not presented in the report. Steps were taken to minimise bias by having more than one reviewer undertake the validity assessment and data extraction. It was unclear whether the process of study selection was performed in duplicate. Relevant criteria were used to examine the study quality. Statistical heterogeneity was assessed and appropriate statistical methods were used to pool the results.

This review was generally well-conducted and the authors' conclusions reflected the evidence presented. However, some caution might be required in interpreting these conclusions because of the poor quality of most of the included trials.

Implications of the review for practice and research
Practice: The authors stated that the strategy involving either induction of labour or active expectation should be regarded as a relevant approach for the management of post-date pregnancies.

Research: The authors stated that further RCTs with an adequate power were required to compare elective induction of
labour with expectant management for post-date pregnancies.

**Funding**
Sahlgrenska University Hospital.

**Bibliographic details**

**PubMedID**
19140042

**DOI**
10.1080/00016340802555948

**Original Paper URL**
http://www.informaworld.com/smpp/content~db=all?content=10.1080/00016340802555948

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Adult; Cesarean Section /statistics & numerical data; Elective Surgical Procedures /methods /trends; Female; Fetal Death; Follow-Up Studies; Gestational Age; Humans; Infant, Newborn; Labor, Induced /methods /trends; Maternal Mortality /trends; Perinatal Mortality /trends; Postpartum Period; Practice Patterns, Physicians' /standards /trends; Pregnancy; Pregnancy Outcome; Pregnancy, Prolonged /mortality /surgery /therapy; Randomized Controlled Trials as Topic; Risk Assessment; Sensitivity and Specificity; Young Adult

**AccessionNumber**
12009103400

**Date bibliographic record published**
20/05/2009

**Date abstract record published**
12/08/2009

**Record Status**
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.