Management of prolonged pregnancy

Authors' objectives
The review evaluated the benefits and risks of different strategies for the management of prolonged pregnancy in order to avoid adverse perinatal and maternal outcomes.

Searching
MEDLINE (from 1980 to December 2000), HealthSTAR (from 1980 to December 2000), CINAHL (from 1983 to December 2000), EMBASE (from 1980 to December 2000), the Cochrane Database of Systematic Reviews (Issue 4, 2000; Issues 1 and 2, 2001) and DARE were searched. The references lists of all included articles, particularly Cochrane reviews, were checked and current issues of journals not yet indexed were handsearched; NIS '97 data were also examined. The search strategies were detailed in the review. Only English language articles were included.

Study selection
Study designs of evaluations included in the review
To address the question of the benefit and risks of the interventions reviewed, only randomised controlled trials (RCTs) were included.

Specific interventions included in the review
The review considered three categories of intervention: antepartum testing, interventions to induce labour, and no intervention (neither induction nor testing). The review did not examine the role of routine ultrasound in early pregnancy, or interventions performed during labour and delivery to reduce the risks of adverse outcomes of conditions associated with prolonged pregnancy. The tests reviewed were as follows:

- tests to determine the risk of stillbirth or compromise related to prolonged gestation included maternal measurement of foetal movement, nonstress test, contraction stress test using either nipple stimulation or oxytocin, amniotic fluid measurements, and Doppler measurements of umbilical or foetal cerebral blood flow;
- tests to determine the risk of macrosomia included estimation of foetal weight by maternal judgment, clinical examination and ultrasound;
- tests to estimate the likely success of the induction of labour included clinical estimation of cervical ripeness (Bishop's score) and fibronectin.

The testing varied with regard to timing (40, 41 or 42 weeks) and initiation.

The interventions to induce labour were interventions to prevent prolonged pregnancy, and planned induction of labour (41 weeks, 42 weeks, and later than planned date).

The actual agents or interventions employed to induce labour were: amniotomy, castor oil, extra-amniotic saline instillation, relaxin, sweeping of membranes, foley catheter, nipple stimulation, oxytocin, prostaglandins (prostaglandin E2 and misoprostol) and mifepristone.

Participants included in the review
The patient population comprised pregnant women with a single foetus in the vertex position approaching or past the expected date of confinement, who were without any other medical or obstetrical complications, and where the only potential factor increasing the risk of an adverse perinatal or maternal outcome was advanced gestational age. Prior Caesarean section was an exclusion criterion in the majority of primary studies reviewed.

Outcomes assessed in the review
The review's primary outcomes were measures of reduction in maternal or foetal adverse outcomes: maternal mortality, perinatal mortality, maternal morbidity, perinatal morbidity and surrogate measures (neonatal umbilical artery pH, Apgar scores, meconium-stained amniotic fluid, non-reassuring foetal heart rate tracing, Caesarean section rates). Test operating characteristics were also reported in the review.

How were decisions on the relevance of primary studies made?
Two reviewers independently screened references and any disagreements were resolved by consensus.

Assessment of study quality
The included studies were evaluated in terms of the following: randomisation, description and generalisability of the study population; description of the interventions; description of the criteria used to make management decisions associated with primary outcomes; sample size and power calculations; and appropriate statistical analysis and testing. An overall quality score was not calculated, but findings for individual criteria were considered and reported. One reviewer performed the quality assessment and a second checked it.

Data extraction
One reviewer extracted the data and a second reviewer checked them. Additional checks of the evidence tables were made.

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative according to four specific questions employed by the review.

What are the test characteristics and costs of measures used in the management of prolonged pregnancy to assess (a) risks to the foetus and mother of prolonged pregnancy, and (b) the likelihood of a successful induction of labour?

What is the direct evidence comparing the benefits, risks and costs of planned induction versus expectant management at various gestational ages?

What are the benefits, risks and costs of currently available interventions for the induction of labour?

Are the epidemiology and outcomes of prolonged pregnancy different for women in different ethnic, socioeconomic and age groups?

How were differences between studies investigated?
The studies and their differences were discussed in the text.

Results of the review
Fifteen studies comparing planned induction with expectant management were included, 76 trials investigated specific interventions for the induction of labour, and there were an additional 42 studies on testing. The total number of women included in the review was not reported and, because of the complex nature of the review, was not calculated for this abstract. Details of the individual studies were reported.

There was no direct unbiased evidence that antepartum testing reduces perinatal morbidity and mortality in prolonged gestation, although retrospective data suggested a higher risk of morbidity in women who did not receive testing. There was no evidence that enables the optimal time for the initiation of antepartum testing to be determined. There was also no evidence to support testing prior to 41 weeks gestation in otherwise uncomplicated pregnancies in order to improve outcomes for either mother or infant.

There was a consistent (but usually not statistically significant) finding in trials that perinatal mortality rates are lower with planned induction at 41 weeks or later in comparison with expectant management. The results of a Cochrane review meta-analysis confirmed this. Other perinatal outcomes and maternal outcomes did not differ.
Sweeping of membranes appeared to be effective at inducing labour without increasing adverse maternal outcomes. For induction agents, in general, there was found to be a trade-off between the effectiveness in achieving delivery and increased risks of adverse outcomes.

The current published literature did not provide information on the potential effects of race and ethnicity, socioeconomic status or age on the outcomes of prolonged pregnancy.

**Cost information**
The review did investigate cost-effectiveness but some information was not available: the cost-effectiveness of a test of foetal well-being could not be estimated; planned induction at 41 weeks was less expensive than expectant management, although further research is needed; no conclusions on the relative cost-effectiveness of different agents for the induction of labour could be drawn.

**Authors’ conclusions**
Much remains to be learned about the optimal management of pregnancy of women with prolonged, but otherwise uncomplicated, pregnancy. Whilst it is clear that the risks of adverse outcomes increase with advancing gestational age, the point at which interventions are beneficial is unclear. Planned induction at 41 weeks’ gestation reduces the risk of perinatal mortality compared with expectant management and antepartum testing.

**CRD commentary**
This was a very wide-ranging review with a range of inclusion criteria, although it was not always clear what the criteria were. The literature search was fairly comprehensive in terms of the number of databases searched, but it was limited to English language papers. The methods used by the reviewers were good and clearly described and were likely to have minimised reviewer bias. The number of studies included in the various sections of the report was not always easy to identify; however, all of the studies were included in the evidence tables.

This review presents a useful summary of the available literature on the benefits of interventions for prolonged labour. It included a detailed assessment of the test characteristics of the tests available for antepartum testing, as well as the overall benefits of testing as a strategy. It was unclear why a quantitative synthesis (meta-analysis) was not used for at least some aspects of the review.

**Implications of the review for practice and research**
Practice: The authors did not state any implications for practice.

Research: The authors stated that much further clinical research into the estimation of risks associated with prolonged gestation, the testing methods, and interventions for induction is needed. Such research should be conducted in the general population and in specific populations. Detailed recommendations were listed in the review.

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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.