Expectant, medical, or surgical management of first-trimester miscarriage: a meta-analysis
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CRD summary
This review compared surgical, expectant and medical management of first-trimester miscarriage. Surgical management was significantly more likely to induce complete evacuation of the uterus after miscarriage than medical management. The review was fairly well conducted, but the results should be interpreted with caution given the variable quality and differences between the included studies.

Authors’ objectives
To assess the relative benefits and harms of different management options for first-trimester miscarriage.

Searching
MEDLINE, EMBASE and the Cochrane Controlled Trials Register were searched from 1966 to July 2004, and the references from retrieved articles screened. The keywords were provided. Studies reported in any European language were eligible for inclusion.

Study selection
Randomised controlled trials (RCTs) or quasi-randomised controlled trials were eligible for inclusion. Trials reported in abstracts and letters were eligible for inclusion.

Specific interventions included in the review
Three types of management were eligible for inclusion: surgical management (i.e. dilation and curettage or aspiration), expectant management or medical management (e.g. vaginal and oral misoprostol). Information on drugs and dosages was provided.

Participants included in the review
Women with first-trimester missed or incomplete miscarriage (delivery or loss of the products of conception before the 20th week of pregnancy) were eligible for inclusion. Miscarriage ranged from less than 7 weeks' gestation up to less than 16 weeks' gestation.

Outcomes assessed in the review
The primary outcomes of interest were successful treatment in terms of the complete evacuation of the uterus, and patient satisfaction or method preference. The secondary outcomes included incidence of moderate or severe bleeding, need for blood transfusion, need for emergency curettage, and incidence of pelvic inflammatory disease (PID), nausea, vomiting and diarrhoea.

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

Assessment of study quality
Study quality was assessed by the adequacy of randomisation, allocation concealment, double-blinding and withdrawal description. The authors did not state how many reviewers performed the assessment.

Data extraction
Two reviewers independently extracted the data and any disagreements were resolved through consensus. Authors were contacted where data were missing.

Methods of synthesis
How were the studies combined?
A meta-analysis was used to estimate the pooled risk ratio and risk difference (RD), with 95% confidence intervals.
(CIs), using both fixed-effect and random-effects models. The results obtained using random-effects models were presented in the text. The authors also calculated the number-needed-to-treat (NNT). The following comparisons were made: medical versus expectant management, surgical versus expectant management, surgical versus medical management, and vaginal versus oral misoprostol. The authors stated that whilst they did not formally assess publication bias, they did consider the overall effectiveness of the largest trials in comparison with the results from the meta-analyses.

How were differences between studies investigated?
A chi-squared test was used to test statistical heterogeneity. Where possible, studies were split into subgroups: studies that included only cases of gestational age of 8 weeks or less, those that included only incomplete miscarriages, and those that reported success at 48 hours or more.

Results of the review
Twenty-seven trials (n=3,177) were included; the number of participants in each trial ranged from 20 to 611.

The authors reported that 3 studies were double-blind, 16 adequately described the method of randomisation, 15 adequately described allocation concealment and 26 adequately described withdrawals.

Seven studies compared medical with expectant management (n=513). Medical management was almost three times more likely than expectant management to induce complete evacuation of conception products (RD 49.7%, 95% CI: 28.3, 71.1, p<0.001) with an NNT of 2. However, there was significant heterogeneity between the studies (p<0.001). Patient satisfaction could not be compared. 

Five studies compared surgical with expectant management (n=545). There was no significant difference in complete evacuation of the uterine cavity between the two management strategies, although the results favoured surgical management (overall RD 16.2%, 95% CI: -2.5, 35.0, p=0.09). There was significant heterogeneity between the studies (p<0.001). Based on 2 studies with significant heterogeneity (p=0.02), there was no significant difference in the rate of patient satisfaction.

Nine studies compared surgical with medical management (n=1,376). Surgical management was more likely than medical management to induce complete evacuation of conception products (RD 32.8%, 95% CI: 14.4, 51.1; p<0.001) with an NNT of 3. However, there was significant heterogeneity between the studies (p<0.001). Patient satisfaction did not significantly differ between surgical and medical management. 

Four studies compared vaginal with oral misoprostol (n=496). These medical treatments did not significantly differ in rates of successful treatment (RD 8.3%, CIs not reported, p=0.29). There was significant heterogeneity between the studies.

In addition, one study compared different doses of oral misoprostol, one compared misoprostol with dinoprostone, and one compared methotrexate plus misoprostol with misoprostol alone (overall n=247).

Subgroup analyses did not change directions of significance for any of the comparisons. No differences in major complications or adverse events were reported for any of the comparisons.

Authors’ conclusions
Surgical management was significantly more likely to induce complete evacuation of the uterus after miscarriage than medical management. Expectant management had a variable success rate, probably depending on the type of miscarriage. Patient satisfaction was only reported in a few trials, with only small differences observed between the various methods.

CRD commentary
The review addressed a clear question and undertook a comprehensive search for published trials. The potential for publication bias was not formally assessed, but was considered. Two reviewers independently extracted the data, thus reducing some risk of reviewer bias, although it was not stated how many reviewers were involved in the selection.
process. A quality assessment was conducted, but it appears that approximately 40% of the studies were methodologically poorly reported. The quality of these included studies was not addressed when interpreting the data.

The authors conducted a meta-analysis but found significant statistical and clinical heterogeneity between the studies, suggesting that it might not have been appropriate to pool the results. Regardless of this, the lack of significant results between surgical and expectant management is surprising given the results from the other comparisons. This review was fairly well conducted, however, owing to the variable quality of the included studies and heterogeneity between them, the statistical results should be interpreted with caution.

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

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