CRD summary
This well-conducted review found that there is some evidence that manual vacuum aspiration is as effective and acceptable as electric vacuum aspiration (EVA) and that it may be safer than EVA. These conclusions are likely to be reliable, although the authors appropriately recommended some degree of caution in interpreting the results given the small sample sizes and methodological limitations of some of the included studies.

Authors' objectives
To evaluate the safety, efficacy and acceptability of manual vacuum aspiration (MVA) in comparison with electric vacuum aspiration (EVA) for first-trimester abortion.

Searching
MEDLINE, EMBASE, the Cochrane Library and Chinese Biomedical Database were searched from inception to December 2006; the search terms were reported. The reference lists of retrieved papers were screened. No language restrictions were applied.

Study selection
Randomised controlled trials (RCTs) that compared MVA with EVA in pregnant women aged at least 15 years in good physical and mental health, whose pregnancy was 12 weeks or less from the last menstrual period (as dated by ultrasonography) and that reported primary outcomes of complete abortion, uterine perforation, blood loss or severe pain perception, were eligible. The secondary outcomes were operation time, cost and acceptability of the abortion method. The studies were conducted in the USA, China and Sweden. Where reported, women were given paracervical block for pain management. The mean age of the participants ranged from 23 to 29 years, and gestational age ranged from ≤42 to ≤77 days. The duration of follow-up ranged from 1 to 8 weeks, with four only following up until discharge from hospital.

Two reviewers independently assessed studies for inclusion, and any disagreements were resolved through consensus or by referral to a third reviewer.

Assessment of study quality
The methodological quality of the studies was assessed on the basis of the following criteria: randomisation, allocation concealment, blinding, reporting loss to follow-up or withdrawal, and baseline comparability. Items were rated as adequate (A), unclear or partially met (B), or inadequate (C). Studies were considered to be of a high quality if all items were rated as adequate; studies that scored all A or B were considered to be of a moderate quality, while those with one or more C scores were considered to be of a low quality.

Two reviewers independently performed the quality assessment, and any disagreements were resolved through consensus or by referral to a third reviewer.

Data extraction
The data were extracted on an intention-to-treat basis. If trials did not perform an intention-to-treat analysis then the results were recalculated for all randomised women with drop-outs assigned the best outcome (dichotomous variables) or the mean (continuous variables). Data were extracted as relative risks (RRs) or risk differences (RDs) for dichotomous outcomes, and as mean differences for continuous outcomes.

Two reviewers independently extracted the data, and any disagreements were resolved through consensus or by referral to a third reviewer.
Methods of synthesis
Pooled RRs, RDs and weighted mean differences (WMDs) were calculated, together with 95% confidence intervals (CIs), using a fixed-effect meta-analysis. Heterogeneity was assessed using the $\chi^2$ (p<0.10 indicating heterogeneity) and $I^2$ statistics. If significant heterogeneity was found, pooling was not carried out; instead, possible explanations for heterogeneity were investigated using either a narrative description or through subgroup analysis. Publication bias was assessed using a funnel plot.

Results of the review
Ten studies (1,660 women) were included in the review. None were considered to be of a high quality, three were considered to be of moderate quality, and seven were considered poor quality. Only one study described the randomisation process, three reported concealment of allocation, and none reported the use of blinding.

Both techniques had high complete abortion rates of over 97% (5 studies); there was no significant difference between the two techniques (RR 1.00, 95% CI: 0.99, 1.02, p=0.66). One study (n=172) reported no incidence of uterine perforation with either technique, whilst a second study (n=300) reported 8 cases of uterine perforation with EVA and none with MVA (RD 0.05, 95% CI: 0.02, 0.09). MVA was associated with reduced blood loss compared with EVA (RD -1.83, 95% CI: -2.43, -1.22, p<0.0001; 3 studies). MVA was associated with reduced pain at gestational age <50 days (RR 0.04, 95% CI: 0.01, 0.12, p<0.001; 4 studies), but not at less than 77 days (RR 0.78, 95% CI: 0.43, 1.41, p=0.41; 2 studies). MVA was also associated with an increase in operation time (WMD 0.32, 95% CI: 0.02, 0.63; 2 studies). There was no difference in patient preference for procedure (3 studies), however, physicians found MVA more difficult to perform than EVA (RR 5.70, 95% CI: 2.45, 13.28, p<0.001; 2 studies). There was no evidence of publication bias.

Cost information
None of the trials reported data on costs.

Authors' conclusions
There is some evidence that MVA is as effective and acceptable as EVA and that it may be safer than EVA. However, the results should be interpreted with some caution given the small samples sizes and methodological limitations of the included studies.

CRD commentary
The review addressed a focused question and the inclusion criteria were clearly defined. The literature search was adequate, although there were no specific attempts to locate unpublished studies. Publication bias was considered in the review and no evidence of its existence was found. Appropriate steps were taken to minimise bias and errors at all stages of the review process. A detailed quality assessment was carried out using appropriate criteria, and the results were tabulated clearly and discussed in the text. Adequate study details were presented in tabular format. The decision to pool the data was appropriate, and heterogeneity was assessed and investigated further when found. This was a well-conducted review and the authors' conclusions are likely to be reliable. However, as already stated, the results should be interpreted with some caution given the small samples sizes and methodological limitations of the included studies.

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

Research: The authors stated that large, well-designed RCTs of good methodological quality with longer durations of follow-up and consideration of operation settings, for example the possibility of carrying out such operations in primary care settings, are needed.

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