Authors' objectives
To conduct a systematic review of the techniques proposed to prevent perineal trauma during childbirth, and to summarise quantitatively the evidence from randomised trials for the efficacy of these techniques.

Searching
MEDLINE was searched from 1966 to 1999 for reports of RCTs published in any language. The search terms were 'childbirth or pregnancy or delivery', 'perineum', 'episiotomy', 'perineal massage', 'obstetric forceps', 'vacuum extraction', 'labor (sic) stage-second'. The authors also searched MEDLINE, the Cochrane Library (Issue 1, 1999) and the Cochrane Pregnancy and Childbirth Database (1995) for systematic reviews of the management of the second stage of labour. The reference lists of the identified reviews and articles were examined for original papers.

Study selection
Randomised and quasi-randomised studies were included. Studies with a non-randomised design were included, but only if no randomised controlled trials (RCTs) of an intervention were found.

Specific interventions included in the review
Studies of an intervention to prevent perineal trauma were included. These included the following: episiotomy (median and mediolateral); operative vaginal delivery (vacuum or forceps); perineal massage before or during labour; birthing position; whirlpool baths; head flexion; head restraint; perineal support or easing back the perineum; perineal compress or lubrication; different maternal pushing instructions; timing of delivery relative to contractions; and perineal analgesia.

Participants included in the review
The participants in the included studies were not described in the review.

Outcomes assessed in the review
Studies were included on the basis of their complete reporting of perineal outcomes, including lacerations and episiotomies. Studies that did not report the outcomes by intention to treat, or had incomplete or internally inconsistent reporting of the perineal outcomes, were excluded.

How were decisions on the relevance of primary studies made?
The final selection of the studies for inclusion in the review was by consensus of two reviewers.

Assessment of study quality
Each study was assigned a quality score using the scale proposed by Jadad et al. (see Other Publications of Related Interest no.1). The authors do not state how the papers were assessed for quality, or how many of the reviewers performed the quality assessment.

Data extraction
The data extraction was achieved by consensus of two reviewers. The type of data extracted was not reported.

Methods of synthesis
How were the studies combined?
Data from RCTs that evaluated similar interventions were combined to determine a weighted estimate of risk.
difference. The number of women needed to receive (or avoid) an intervention to prevent one case of sutured perineal trauma or anal sphincter trauma was calculated (i.e. the number-needed-to-treat). A random-effects model was used for meta-analysis (see Other Publications of Related Interest no.2). Non-randomised studies were used only to identify those techniques that needed further study, and were not summarised quantitatively.

How were differences between studies investigated?
The meta-analyses included a chi-squared test of heterogeneity. Significant heterogeneity was explored using sensitivity analyses, sequentially dropping one study at a time, and by restricting the meta-analysis to trials with a quality score of 3 (3 was the highest possible score in this review as double-blinding was not possible for any of the interventions).

Results of the review
There were 5 RCTs (n=4,650) of episiotomy included; 1 RCT (n=333) of spontaneous delivery versus forceps; 7 RCTs (n=2,582) of forceps versus vacuum extraction; 3 RCTs (n=1,547) of perineal massage; 9 RCTs of birthing position, 7 with supporting furniture (n=2,958) and 2 without (n not reported); 1 RCT (n not reported) of whirlpool baths; 1 RCT (n=5,471) of head flexion; and 2 RCTs (n=382) of pushing instructions.

Episiotomy (5 RCTs, n=4,650).
The weighted risk difference in perineal traumas that required suturing was -0.23 (95% CI: -0.35, -0.11) in favour of avoiding episiotomy, compared with liberal episiotomy (n=4,631). This is equivalent to an absolute decrease of 23% in the risk of sutured perineal trauma. Avoiding routine episiotomy in 4.4 women would prevent one case of perineal trauma that required suturing. The risk difference was similar when the only trial of median episiotomy was excluded. There was significant heterogeneity between the trials that was not eliminated by excluding any one trial. When including only the 3 trials with a high quality score, the risk difference was reduced to -0.14 (95% CI: -0.27, +0.01), but there was still significant heterogeneity. No difference was shown in anal sphincter trauma (n=4,650).

Operative vaginal delivery (8 RCTs).
In one RCT (n=333) of spontaneous delivery versus forceps, the risk difference for perineal trauma was -0.11 (95% CI: -0.18, -0.04) in favour of spontaneous delivery. This equates to one in nine women who give birth without forceps avoiding a third degree tear.

Vacuum extraction caused less anal sphincter trauma than forceps delivery (risk difference -0.06, 95% CI: -0.10, -0.02), based on 7 RCTs (n=2,582). One anal sphincter tear would be avoided for every 18 women whose delivery was assisted by vacuum rather than forceps. Heterogeneity between the trials was not significant.

Perineal massage (3 RCTs, n=1,547).
In nulliparous women, perineal massage in the weeks before giving birth protected against trauma to the perineum (risk difference -0.08, 95% CI: -0.12, -0.04). One case of perineal trauma that required suturing would be avoided for every 13 women who did prenatal perineal massage. Heterogeneity between the trials was not significant.

No RCTs of easing back the perineum in the second stage of labour were found.

Positioning for birthing (9 RCTs).
No statistically-significant difference was found in perineal trauma when comparing the supported upright position versus recumbent position of the mother during the second stage of labour (risk difference 0.02, 95% CI: -0.05, +0.09), based on 7 RCTs (n=2,958). Heterogeneity between the trials was significant. Analysis of only the 3 good-quality trials (n=1,825) eliminated the heterogeneity without changing the findings (risk difference -0.03, 95% CI: -0.07, +0.01). The effect of birthing position on perineal trauma could not be assessed adequately from the 2 trials that compared the two positions (recumbent and upright) without the use of supporting furniture.

Whirlpool baths (1 RCT, n not reported).
The RCT of using a jacuzzi during labour (but not for birth) found fewer operative deliveries and less perineal trauma in the jacuzzi group (no further details were reported).

Flexion of the head (1 RCT, n=5,471).

A large RCT of infant head flexion and perineal support, as applied by a midwife, versus no such support, found no statistically-significant difference in sutured perineal trauma (risk difference 0.01, 95% CI: -0.02, +0.04).

Minimising pushing (2 RCTs, n=382).

The 2 RCTs that compared instructed with spontaneous pushing found no difference in perineal trauma (the data were not reported).

**Authors’ conclusions**
Factors shown to increase perineal integrity include avoiding episiotomy, spontaneous or vacuum-assisted birth rather than forceps delivery, and in nulliparous women, perineal massage during the weeks before childbirth. The second-stage position has little effect.

**CRD commentary**
This review addressed a clear question in terms of the intervention and outcomes, as well as the study design, of interest. The search strategy was adequate to identify relevant RCTs and no language restrictions were applied to the search. The included RCTs were assessed for quality in a systematic way; however, how this was performed, and the results of it, were not presented. Quality was taken into account in the interpretation of the results. The findings based on the meta-analysis where heterogeneity was significant should be interpreted with caution; although potential sources of heterogeneity were explored it could not always be accounted for. It would have been helpful to have tabulated the characteristics of the included studies, to further clarify the key differences between the trials. In particular, the participants in each trial were not defined other than occasionally (e.g. as nullipara) in the narrative results section, and it would be useful to practitioners and mothers to know more about the setting in which the trials were conducted. The pooled results from the RCTs were presented in clear graphs as risk differences, and were discussed clearly in the text. The numbers-needed-to-treat, however, were reported without CIs. The findings from non-randomised studies were reported in the narrative to highlight areas where research evidence was found to be weak or lacking.

In general, the conclusions follow from the results; however, in some cases, the lower limits of the CIs and the analysis of only higher-quality trials might suggest a more cautious conclusion. The reader should pay attention to these factors when applying the findings from this review to their own practice. The indications for research highlighted by the authors are clearly stated. In addition, they appear to be sensible and to follow on from the findings of the review.

**Implications of the review for practice and research**
Practice: The authors did not state any implications for practice.
Research: The authors state that more information from RCTs of techniques to protect the perineum during spontaneous delivery is sorely needed. This should including perineal stretching massage during labour, perineal compresses, techniques of flexion of the infant’s head during delivery, and techniques aimed at slowing delivery to allow time for perineal stretching.

**Bibliographic details**

**PubMedID**
10711565
Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Delivery, Obstetric /adverse effects; Episiotomy /adverse effects; Extraction, Obstetrical /adverse effects; Female; Humans; Massage; Perineum /injuries; Pregnancy

AccessionNumber
1200000534

Date bibliographic record published
30/06/2002

Date abstract record published
30/06/2002

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.