Acupuncture for labor pain management: A systematic review

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KEY WORDS
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Labor
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Systematic review

Acupuncture is an important treatment modality of traditional Chinese medicine involving stimulation of specific points by manually inserting and manipulating fine needles with the aim of curing disease and/or promoting health. In addition to manual needling, several other methods are used for stimulation of acupuncture points, for example, electrical stimulation, laser, and moxibustion (burning herbal preparations containing Artemisia vulgaris or mugwort on acupuncture point). The most commonly used is manual acupuncture where fine, disposable stainless steel needles are inserted into selected acupuncture points and manipulated by rotating to elicit a characteristic needle sensation called De-Qi. The choice of stimulation modality, acupuncture points, and manipulation method mainly depends on therapist experience/preference, patients, and conditions and is often individualized. Since the 1970s, acupuncture research has been one of the most intensely researched areas of complementary and alternative medicine, and a considerable amount of literature has accumulated on the subject.1,2 Acupuncture has been used, in particular, for a variety of painful conditions and some of them are supported by good evidence from controlled clinical trials.3-6

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In obstetrics and gynecology, acupuncture is applied for a range of conditions, including dysmenorrhea, morning sickness, breech version (moxibustion, ie, burning herbal preparations containing A vulgaris or mugwort on acupuncture point), labor induction, analgesia during oocyte retrieval, and labor. Several observational studies or nonrandomized, retrospective, controlled studies suggest that acupuncture is effective for relieving labor pain but the evidence is contradictory.

Therefore, this systematic review was conducted to critically evaluate and summarize all the evidence from randomized clinical trials (RCTs) of acupuncture as a supportive analgesic method during labor.

Methods

Systematic literature searches were conducted in the following electronic databases: MEDLINE, EMBASE, AMED, CINAHL, PsycINFO, British Nursing Index, and The Cochrane Library (all from their inception to December 2003). The search terms were acupuncture, electroacupuncture, labour/labor, and childbirth. Combinations of these key words were used and no language restriction was imposed. The references of all located articles were reviewed and our department’s own files on acupuncture were hand-searched for further relevant articles.

Studies were included if they were prospective, randomized, clinical studies of acupuncture, electroacupuncture, auricular acupuncture interventions involving needle insertion during labor, and have objective and/or subjective pain-related outcome measures, ie, request for analgesics or epidural analgesia (EDA), request for any pharmacologic or nonpharmacologic analgesia, pain intensity assessed by parturient, and choosing acupuncture for any future labor. The control interventions were usual care only or placebo acupuncture. Data extraction and validation were carried out by using a predefined, standardized form by 2 independent reviewers who resolved differences by discussion. Quality of reporting was assessed on the 5-point Jadad scale. Taking account of the fact that it is virtually impossible for an acupuncturist to be blinded to the treatment, we used a modification of this scale. Points were awarded as follows: study described as randomized, 1 point; additional point for appropriate randomization method, 1 point; inappropriate randomization method, deduct 1 point; patient blinded to intervention (ie, control procedure was indistinguishable from real acupuncture), 1 point; assessor blinded to intervention, 1 point; description of withdrawals and dropouts, 1 point. The maximum points available were 5. Patient-blinding was assumed where the control intervention was indistinguishable from acupuncture, even if the word “blinding” did not occur in the report. Point for assessor-blinding was only given if specified in the text. Trials with 4 or 5 points were considered high quality.

Statistical analysis was performed with Review Manager (RevMan 4.2.3, The Cochrane Collaboration) software. For dichotomous data, summary relative risks (RR) were calculated by using a fixed effects model. For continuous data, weighted mean differences (WMD) were calculated. 95% CI were used. Heterogeneity between trials was sought if applicable and mentioned where found. Pooled data analysis was limited to the percentage of patients using meperidine and EDA, and reanalysis of the data was performed if necessary.

Results

Figure 1 summarizes the results of our literature searches. Three RCTs were included with 496 parturients (Table I). Of the 496, 258 participants received acupuncture treatment in the intervention group and 238 participants acted as controls. Two RCTs compared manual acupuncture with conventional care, and 1 RCT compared manual acupuncture with placebo acupuncture. All were conducted in a hospital setting, 1 in Sweden and 2 in Norway. The methodologic quality was considered good: 3 points on the modified Jadad scale were given to 2 trials and 4 points to 1 trial. Table II shows the comparisons of the available data and meta-analyses for the request for meperidine and EDA. Tests for significance and, if applicable, heterogeneity among trials are also presented.

Nesheim et al conducted a randomized, unblinded trial in 198 healthy parturients. The acupuncture group who received individualized manual acupuncture (n = 106) was compared with the conventional care-only group (n = 92). Significantly fewer women in the acupuncture group requested meperidine compared with the conventional care group (P < .0001). With regard to the amount of meperidine given, there was no difference between groups (median 75 mg, range 25-100 mg in all groups). Significantly fewer parturients in the acupuncture group requested other analgesia (EDA, meperidine, nitrous oxide, and sterile water papules) compared with conventional care group (RR 0.81, 95% CI 0.69-0.96, P = .01). Of 103 parturients who had acupuncture treatment, 89 stated they would use acupuncture for their next childbirth. There were no significant differences in labor outcomes (ie, duration of labor, weight of infant, frequency of cesarean sections, and Apgar score). No noticeable adverse events were reported in the acupuncture group.

A randomized, nonblinded, controlled trial with 2 parallel groups was performed by Ramnerö et al in 90 parturients with uncomplicated births. Parturients were randomly assigned to either receive manual acupuncture
390 Articles identified

370 Articles excluded on the basis of title and abstract

309 Not specific to area of review

60 No clinical studies/clinical studies not meeting inclusion criteria

1 Reports not assessing an acupuncture intervention

20 Articles selected

17 Articles excluded after obtaining the full text

2 Not specific to area of review

7 Non-randomised studies

8 Commentary/summary/letter related with the included RCTs

3 RCTs evaluated

Figure 1 Flow diagram of literature searching.
The 11 participating midwives had attended a 4-day course in basic and theoretic concepts of acupuncture for labor pain, and had been offering acupuncture treatment in the labor ward for about 1 year. All patients had access to all conventional analgesic methods available at the delivery ward, including nonpharmacologic approaches (ie, transcutaneous electrical nerve stimulation [TENS], warm rice bag, bath/shower, and intracutaneous injections of sterile water) and pharmacologic treatments.

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Statistical significance criteria: *P < .05; **P < .01; ****P < .0001. Acup, Acupuncture; Con, control; ITT, intention-to-treat; MA, manual acupuncture; NRS, numeric rating scale ranging from 0 (“no pain”) to 10 (“worst pain”); pt, patient; ↓, decrease; Δ, change. In none of the RCTs were adverse effects noted.

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<tr>
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<td>Pt using EDA</td>
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Significant differences: P < .05, in bold. Acup, Acupuncture; con, control; n/N, number of patients with the event/total number of patients.
A number of weaknesses with the original RCTs must be noted. We adopted the modified Jadad scale where a point is awarded for patient-blinding and for assessor-blinding, respectively. Of the three RCTs, 2 made no attempt at either subject or assessor-blinding. Lack of blinding or inadequate blinding can cause an overestimation of the treatment. Therefore, the positive conclusions of these studies may be overoptimistic. Placebo or sham acupuncture interventions include minimal acupuncture and sham needle devices that mimic acupuncture stimulation without inserting needles into skin. The only placebo-controlled trial in this review is also not flawless: the credibility of the placebo was monitored retrospectively in only 8 parturients from each group. Although there are some practical difficulties such as recruiting acupuncture-naive parturients and training acupuncturists or midwives to perform indiscernible intervention with a sham needle device, rigorous trials adopting an appropriate placebo control will be helpful in answering the age-old question whether acupuncture generates more than a placebo response. The only placebo-controlled trial also attempted to mask the assessor but this does not seem to have been maintained throughout the trial: thus, the 1 point for assessor-blinding on the modified Jadad scale was not given. In all 3 RCTs, midwives who were the main care providers also performed acupuncture treatment. Assessor-blinding, however, is essential in principle so as to minimize measurement bias. If it is considered impracticable, to include blinded third-party assessor during delivery, at least the data evaluator should be masked.

The choice of outcome measure is another important determinant of study quality. All 3 RCTs reported the request for meperidine and EDA as an objective measure of pain and 2 studies also assessed maternal pain relief on a numeric rating scale as subjective outcome measures of pain. Previous studies have demonstrated a discrepancy between the labor pain perceptions of patients and the pain assessments by midwives or physicians. An optimal way of quantifying analgesic effects of interventions with potentially powerful placebo effects, would be to include both subjective and objective measures of pain. The trial by Ramnér et al was successful in reducing the request for EDA by about 50%, but in the subjective pain assessment on a numeric rating scale, no intergroup difference emerged. In 1 study in which only objective outcome measures of pain were used, acupuncture reduced the request for meperidine but it is not clear whether the request for EDA was also significantly diminished. Only 1 RCT showed a consistent analgesic effect of acupuncture assessed by patient and midwife. This study constitutes the best evidence to date of an analgesic effect of acupuncture. Although all 3 RCTs arrive at positive conclusions regarding the analgesic effects of acupuncture for labor pain, further trials are required to confirm or refute the
effectiveness of this approach. One noticeable finding was that parturients who received acupuncture reported a significantly higher degree of relaxation. As this trial was not blinded in any way, the finding could be unrelated to specific effects of acupuncture. An interesting research question for future trials could be to test whether the acupuncture primarily causes relaxation and as a consequence reduces pain or vice versa.

Safety issues of an intervention are important for estimating its risk-benefit profile. Serious adverse events of acupuncture are on record but infrequent, provided that it is practiced according to established safety rules in appropriate anatomic regions. Nonserious adverse effects such as mild pain or bleeding are reported in about 7% of all cases. Similarly, one might be concerned about the extra cost of acupuncture. At present no conclusive cost evaluations of acupuncture for labor pain are available. Generally speaking, however, prospective economic evaluations of complementary therapies suggest that they would incur additional cost rather than cost savings.

Acupuncture’s mode of action is not well established. In the West, acupuncture is best known for its analgesic effects. There are differences in the concepts of pain between traditional Chinese medicine and conventional Western medicine. In traditional Chinese medicine, pain is believed to be caused by a stagnation of Qi. In Western medicine, the mechanism whereby acupuncture works is believed to be neurohumoral. In addition, a range of investigations have proposed different mechanisms of acupuncture analgesia (eg, different modes of neuronal activation by acupuncture) and intramuscular stimulation for pain relief on the basis of the radiculopathy model. Despite these laboratory findings, the scientific basis of acupuncture analgesia remains hypothetical, and its clinical value in pain control is still controversial. Good evidence for its effectiveness exists in acute dental pain, low back pain, and recurrent headache, whereas the evidence is inconclusive for fibromyalgia and neck pain. In obstetrics and gynecology, acupuncture is often used for dysmenorrhea, nausea and vomiting during pregnancy, breech version (moxibustion), labor induction, and analgesia, but the evidence is limited both in quantity and quality.

Our systematic review has several important limitations. Even though our search strategy was thorough, we cannot be absolutely sure that all RCTs were located by it. Given the small number of studies included, even 1 additional RCT could change the conclusion considerably. The paucity of primary studies, of course, renders any conclusions less certain than one would hope them to be. All systematic reviews are vulnerable to publication bias (eg, the tendency of negative trials remaining unpublished). If publication bias has prevented negative trials to be included in our review, our conclusions might be overoptimistic.

We tested possible statistical heterogeneity between trials. Statistical heterogeneity may be caused by known clinical or methodologic differences between trials, or may be related to unknown trial characteristics. Non-significance of the test of heterogeneity can never be interpreted as evidence of homogeneity of the results of the included trials as tests of heterogeneity have low power and may fail to detect even a moderate degree of genuine heterogeneity as statistically significant. For policy recommendations, a large number of acupuncture trials would be needed to investigate potential sources of heterogeneity.

In conclusion, the collective data from RCTs suggest that acupuncture alleviates pain and reduces analgesic consumption during labor. One RCT suggests that real acupuncture is more effective than placebo acupuncture for this indication. Mainly because of the paucity of primary studies in this area, the effectiveness of acupuncture remains uncertain. Further research is required to establish the value of acupuncture as an adjunctive treatment during labor.

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References