Acupuncture treatment for pain: systematic review of randomised clinical trials with acupuncture, placebo acupuncture, and no acupuncture groups

Madsen M V, Gotzsche P C, Hrobjartsson A

CRD summary
This review assessed acupuncture compared to placebo acupuncture and no acupuncture for pain. The authors concluded that there was a small analgesic effect of acupuncture which lacked clinical relevance. The conclusion was an accurate reflection of the results of a generally well-conducted review, and was likely to be reliable.

Authors' objectives
To evaluate the analgesic effect of acupuncture and placebo acupuncture and to assess the relationship between placebo type and acupuncture effect.

Searching
The Cochrane Library, MEDLINE, EMBASE, Biological Abstracts and PsycLIT were searched to the end of 2007. Full details of the search strategy were provided in a related review (see Other publications of related interest).

Study selection
Three-armed randomised controlled trials (RCTs) that described their intervention as acupuncture and their control conditions as placebo acupuncture and no acupuncture standard care were eligible for inclusion. The primary outcome was patient-assessed pain using a visual analogue or other ranking scale. Studies that used transcutaneous electrical nerve stimulation and manual acupressure were excluded from the review. Also excluded were trials in which the intended basic care programme differed between the groups.

Included studies treated pain from the following conditions: knee osteoarthritis, tension headache, migraine, low back pain, fibromyalgia, abdominal scar pain, postoperative pain and procedural pain during colonoscopy. Treatment duration ranged from one day to 12 weeks. Placebo conditions were non-penetrative needling, superficial needling at non-acupuncture points and other forms of penetrative needling. Third arms consisted of a no acupuncture group. Concomitant treatments included analgesics and physiotherapy.

Three reviewers assessed the studies for inclusion and disagreements were resolved though discussion.

Assessment of study quality
Study validity was assessed by one reviewer and checked by another using the criteria of allocation concealment, blinding of patients and whether dropouts were below 15 per cent. Studies meeting all criteria were considered to be at low risk of bias.

Data extraction
Data extraction was performed by one reviewer and checked by two others. Average pain with its standard deviation after treatment ended was extracted; changes from baseline were used where this was not available. Where several pain scales were used, two reviewers selected the most relevant one while blinded to results. Where pain scores for several time points were reported the one nearest to end of treatment was selected. Where standard deviations were not reported and could not be derived, they were estimated based on values from the other trials. Placebo interventions were rated on a scale of 1 to 5 for likelihood of producing a physiological effect, using a number of criteria.

Methods of synthesis
Standardised mean differences (SMDs) and 95% confidence intervals (CIs) were calculated for each comparison. A random-effects analysis was used if statistical heterogeneity was found to be significant, otherwise a fixed-effect analysis was employed. An a priori sensitivity analysis assessed the impact of using the trial authors' primary outcome. Post-hoc sensitivity analyses assessed the effect of study validity and type of acupuncture. Meta-regression was employed to assess the impact of type of placebo employed. A subgroup analysis was performed to assess the impact of
penetration of skin in placebo acupuncture groups. Publication bias was assessed through visual inspection of funnel plots.

**Results of the review**

Thirteen RCTs (n = 3,025) were included in the review. Eight trials reported allocation concealment, none reported blinding of clinicians and 10 reported blinding of patients. Sample sizes ranged from 30 to 1,039.

There was a statistically significant benefit for acupuncture over placebo acupuncture (SMD -0.17, 95% CI: -0.26, -0.08, p < 0.001). Significant statistical heterogeneity was detected, which was reduced following the exclusion of an outlier trial. The absolute difference between the groups was small, corresponding to 4 mm (95% CI: 2 mm, 6 mm) on a 100 mm visual analogue scale.

There was a statistically significant benefit for placebo acupuncture over no acupuncture (SMD -0.42, 95% CI: -0.60, -0.23, p < 0.001). Again, significant statistical heterogeneity was detected.

Results of sensitivity analyses were also reported but were not markedly different from those of the main analyses. Funnel plot analyses showed no evidence of publication bias.

**Authors' conclusions**

A small analgesic effect of acupuncture was found, which seemed to lack clinical relevance and cannot clearly be distinguished from bias. Whether needling at acupuncture points or at any site reduced pain independently of the psychological impact of the treatment ritual was unclear.

**CRD commentary**

The review question and the inclusion criteria were clear. The authors searched a number of relevant databases. The authors did not report searching systematically for unpublished studies, but publication bias was assessed and no evidence of it was found. Rigorous methodology was employed at all stages of the review process, and an appropriate assessment of study validity was conducted and used to inform the synthesis. The decision to employ meta-analysis appeared appropriate and reasonable steps were taken to assess and explore heterogeneity. However, the decision to adopt a random or fixed-effect analysis based on statistical heterogeneity may not have been appropriate. The authors' conclusions accurately reflected the absolute differences in the results and are likely to be reliable.

**Implications of the review for practice and research**

Practice: The authors did not state any implications for practice.

Research: The authors stated that in future acupuncture trials greater attempts to achieve blinding of healthcare providers should be made, and that attempts to separate the effects of the physiological process of needling and the psychological effect of the treatment ritual or of the patient-provider interaction should be made.

**Funding**

None

**Bibliographic details**

Madsen M V, Gotzsche P C, Hrobjartsson A. Acupuncture treatment for pain: systematic review of randomised clinical trials with acupuncture, placebo acupuncture, and no acupuncture groups. BMJ 2009; 338(a3115)

**PubMedID**

19174438

**Other publications of related interest**

Indexing Status
Subject indexing assigned by NLM

MeSH
Acupuncture Analgesia /methods; Acupuncture Therapy /methods; Humans; Pain /prevention & control; Placebos; Randomized Controlled Trials as Topic; Treatment Outcome

AccessionNumber
12009102164

Date bibliographic record published
02/03/2009

Date abstract record published
31/03/2009

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.