Acupuncture for chronic pain: individual patient data meta-analysis

Vickers AJ, Cronin AM, Maschino AC, Lewith G, MacPherson H, Foster NE, Sherman KJ, Witt CM, Linde K, Acupuncture Trialists' Collaboration

CRD summary

This meta-analysis concluded that acupuncture added to standard care was more effective than standard care alone or standard care with sham acupuncture for four types of chronic pain. Differences between true and sham acupuncture were relatively modest. The authors' conclusions reflect the high quality evidence presented and appear to be reliable.

Authors' objectives

To determine the effectiveness of acupuncture in four chronic pain conditions.

Searching

The authors searched MEDLINE, the Cochrane Central Register of Controlled Trials (CENTRAL) and the reference lists of relevant systematic reviews. The search terms were reported and there were no language restrictions. For the individual patient data (IPD) meta-analysis, the search was performed up to November 2008. A further search for summary data for a sensitivity analysis was done in December 2010.

Study selection

Randomised controlled trials (RCTs) comparing acupuncture needling with either sham acupuncture or no acupuncture were eligible for inclusion. Trials had to include patients with non-specific back or neck pain, shoulder pain, chronic headache, or osteoarthritis; for musculoskeletal disorders the pain had to have lasted for at least four weeks. The primary outcome had to be measured more than four weeks after the initial acupuncture treatment. Only RCTs with clearly adequate allocation concealment were included.

The included RCTs compared acupuncture with no acupuncture (often described as usual or ancillary care), sham acupuncture (various types) or both. A variety of pain outcome measures, such as the Short Form (SF-36) health survey, visual analogue scale, or Oxford Knee Score, were evaluated, at time points ranging from one to 24 months.

Two reviewers selected trials for inclusion and disagreements were resolved by consensus.

Assessment of study quality

The quality of the IPD was checked by replicating all results reported in the trial publication. For RCTs with a sham acupuncture control the quality of blinding was assessed and those trials with a high risk of bias due to poor blinding were excluded from the meta-analysis.

The authors did not report how many reviewers performed these assessments.

Data extraction

IPD for patient outcomes were obtained from the trial investigators and two eligible trials were excluded because IPD were not available.

Methods of synthesis

Included trial data were reanalysed by analysis of covariance with the standardised primary outcome (pain scores, divided by the pooled standard deviation) as the dependent variable, and with the baseline measure of the primary outcome and variables used to stratify randomisation, as covariates. Effect sizes from this analysis were reported as standardised mean differences (SMDs) with 95% confidence intervals (95% CIs). For the primary meta-analysis, these were pooled using a fixed-effect model. Random-effects analyses were performed and reported. Separate analyses were performed for each condition and type of control.

Statistical heterogeneity was assessed, but the methods were not reported. Sources of heterogeneity were investigated in pre-specified sensitivity analyses. Differences between trials, in terms of control interventions and cointerventions were discussed. Publication bias was assessed by comparing effect sizes from large and small trials and by considering the possible effects of missing high-quality unpublished trials.

Results of the review

Thirty-one eligible RCTs were identified; 11 trials were sham controlled, 10 had a no acupuncture control, and 11 had three arms. The IPD meta-analyses included 29 trials, with 17,922 participants; 14,597 compared acupuncture with no acupuncture and 5,230 compared acupuncture with sham control.

Compared with no acupuncture, acupuncture was significantly superior, with pooled standardised mean differences (random-effects model) of 0.57 standard deviations (95% CI 0.29 to 0.85; six RCTs) for osteoarthritis, 0.38 standard deviations (95% CI 0.22 to 0.55; five RCTs) for chronic headache, and 0.51 standard deviations (95% CI 0.36 to 0.67; seven RCTs) for back or neck pain.

Compared with sham treatment, acupuncture was significantly superior. The pooled standardised mean differences were 0.37 (95% CI 0.03 to 0.72; five RCTs) for osteoarthritis, 0.15 (95% CI 0.05 to 0.24; four RCTs) for chronic headache, 0.52 (95% CI 0.14 to 0.90; eight RCTs) for back or neck pain, and 0.62 (95% CI 0.46 to 0.77; three RCTs) for shoulder pain.

The authors stated that with baseline pain scores of 60 out of 100 and a standard deviation of 25, these effect sizes corresponded to response rates (pain reduction of 50% or more) of approximately 30% for no acupuncture, 42.5% for sham acupuncture and 50% for true acupuncture.

Statistical heterogeneity was significant for five of the seven comparisons in the primary analysis. Removal of three RCTs that strongly favoured acupuncture, reduce the heterogeneity for the acupuncture versus sham comparison. The authors stated that heterogeneity for the acupuncture versus no acupuncture comparison was largely explained by differences between the control groups. Pre-specified sensitivity analyses showed that the inclusion of summary data from RCTs for which IPD were not available or which were published too late for inclusion had little impact on the results. Other sensitivity analyses were reported. No evidence of significant publication bias was found.

Authors' conclusions

Acupuncture was effective for the treatment of chronic pain. Significant differences between true and sham acupuncture indicated that acupuncture was more than a placebo, but the modest size of these differences suggested that needling was not the only important contributor to its effects.

CRD commentary

The research question was clear and the inclusion criteria restricted the meta-analysis to the best evidence to answer this question. The search covered a range of relevant sources, but no efforts to locate unpublished trials were reported and there was no specific search for Chinese trials. Publication bias was assessed and no evidence of bias was found. Studies were selected by two independent reviewers, reducing the risk of reviewer error or bias. The quality of the IPD was assessed appropriately and included trials were assessed for risk of bias from lack of blinding, which is particularly important in comparisons of sham and true acupuncture. Limited details of data extraction were reported, but relevant details of the included trials were given in an appendix. Standard methods were used for meta-analysis and the sources of heterogeneity were investigated.

The authors' conclusions reflect the evidence presented and appear to be reliable.

Implications of the review for practice and research

Practice: The authors stated that acupuncture was a reasonable referral option for patients with chronic pain.

Research: The authors did not state any implications for further research.

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