Acupuncture for the management of chronic headache: a systematic review
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CRD summary
This well-conducted review concluded that needling acupuncture was superior to sham acupuncture and medication therapy for reducing chronic headache intensity, frequency and improving response rate. The authors’ conclusion is an accurate reflection of the results but, given differences between trials and small sample sizes, the reliability is uncertain.

Authors’ objectives
To evaluate the efficacy of acupuncture for the treatment of chronic headache.

Searching
MEDLINE, CINAHL, the Cochrane Central Register of Controlled Trials (CENTRAL, 2006) and Scopus were searched without language restriction for relevant articles to November 2007. Search terms were reported. A Chinese medical journal and the bibliographies of retrieved articles and reviews were scanned for additional articles.

Study selection
Randomised controlled trials (RCTs) evaluating the use of needling acupuncture in comparison with sham acupuncture, medication therapy or other non-pharmacological treatment, for chronic headache in adults (aged 18 or over), were eligible for inclusion. Chronic headache included migraine, tension-type headache or both. To be included trials had to report at least one clinical outcome related to headache, such as headache intensity, headache frequency, global assessment of headache, or health related quality of life (QoL). Trials evaluating trigger-points therapy, acupuncture for neck and facial pain only, or where only different forms of acupuncture were compared were excluded. To be included, trials had to evaluate outcomes four weeks or more from start of treatment.

Interventions in the included studies included manual acupuncture, electro-acupuncture, combined manual and electro acupuncture, semi-standardized acupuncture alone or with medication. The number of sessions ranged from six to 20, and duration of treatment ranged from two weeks to six months. Control groups included sham acupuncture, behavioural program, TENS (transcutaneous electric nerve stimulation) at same acupuncture points, pharmacological treatment, physiotherapy, massage and relaxation. The majority of the participants in the included studies were female (range 49% to 100%) and their mean age ranged from 15 to 58 years.

Two reviewers independently selected studies for inclusion.

Assessment of study quality
Validity was assessed using modified criteria based on Juni and the Oxford scale. One point was assigned to trials where both patient and assessor blinding were reported; 2 points were given to trials where patients could not distinguish group allocation and the blinding of assessor was adequately described. The maximum score possible was 7 points, trials with a score of 4 points or more were considered high quality.

Two reviewers independently assessed validity. Disagreements were resolved through discussion based on assessment of double-blinding.

Data extraction
Data were extracted on headache intensity, headache frequency, and response rates, assessed at early and late follow-up periods, and used to calculate estimates of the mean difference (MD) with 95% confidence intervals (CI). Response rate was defined as at least 33% in improvement by assessing headache index or headache frequency or by overall evaluation. For quality of life, the scores for the physical and mental health components of the SF-36 or SF-12 Health Surveys were extracted. Early follow-up was defined as eight weeks to three months after randomisation; late follow-up was defined as three to six months after randomisation. For crossover trials, only data from the first arm of the trial were extracted.
Two reviewers independently extracted data.

**Methods of synthesis**

Trials were grouped by type of control group and data were pooled using a random-effects model. For continuous data, such as headache intensity and headache frequency, the weighted mean difference (WMD) and 95% confidence intervals were calculated; for dichotomous data, such as response rates, the risk ratio (RR) and 95% confidence intervals were calculated. Where trials used different scales to measure headache frequency, the standardized mean difference (SMD) was used. Comparisons of acupuncture with sham acupuncture were prioritised where trials had multiple arms.

Subgroup analyses were conducted based on type of headache (migraine or tension-type headache). Sensitivity analyses were conducted for RCTs scoring 3 or more on the validity scale, and trial blinding (RCTs with 2 points assigned for blinding). Heterogeneity was assessed using the I² statistic.

**Results of the review**

Thirty-one RCTs (n=3,916) were included in the review. Five RCTs scored a maximum of 7 points on the quality scale and 14 RCTs scored more than 4 points. Nine RCTs reported that randomisation was sufficiently addressed and concealment of allocation was appropriately performed. Sample sizes ranged from 28 to 794.

**Acupuncture versus sham treatment:** Acupuncture showed statistically significant improvements in response rate compared with sham acupuncture for all headaches at early follow-up (RR 1.19, 95% CI 1.08 to 1.30; 14 RCTs) and late follow-up (RR 1.22, 99% CI 1.04 to 1.43; two RCTs), for tension headaches at early follow-up (RR 1.26, 95% CI 1.10 to 1.44), but showed no benefits for migraines. There was no evidence of statistical heterogeneity for these analyses (I²=0%). There were no significant differences between acupuncture and sham groups for all headache intensity at early follow-up. However, at late follow-up acupuncture showed statistically significant reductions in headache intensity for all headaches compared to sham acupuncture (WMD -2.62mm, 95% CI -5.07 to -0.17; seven RCTs) and for tension headaches at early follow-up (WMD -3.77mm, 95% CI -7.00 to -0.55; six RCTs) and late follow up (WMD -3.66mm; 95% CI -6.54 to -0.79; four RCTs), but no benefits for migraine headache only (three RCTs). There were no significant differences between groups for headache frequency (nine RCTs), or quality of life (four RCTs). There was no evidence of statistical heterogeneity for these analyses. Sensitivity analyses reported no significant differences to the results.

**Acupuncture versus medication:** Overall, there was a significantly higher response rate for acupuncture compared to medication at early follow-up (RR 1.80, 95% CI 1.16 to 2.81; seven RCTs). However there was evidence of significant heterogeneity (I²=92.6%). Acupuncture showed statistically significant reductions in headache intensity at early follow up compared to medication (WMD -8.54mm, 95% CI -15.52 to -1.57; two RCTs), but there was evidence of heterogeneity (data not reported). The acupuncture group experienced fewer days per month with headache (WMD -0.22, 95% CI -0.41 to -0.03; two RCTs), fewer attacks per month (WMD -1.22, 99% CI -2.34 to -1.10), and better physical function at early follow-up (WMD 4.16, 95% CI 1.33 to 6.98; three RCTs) compared to medication groups, but there were no significant differences between groups for mental health.

Results for other types of control group (non-pharmacological and waiting list) were reported in the paper.

**Safety of acupuncture:** Minor bleeding and bruising or local paraesthesia at needle insertion points (six RCTs) and triggering of a migraine attack (five RCTs) were the most frequently reported adverse effects (six RCTs). The total number of adverse effects was reported to be significantly lower in the acupuncture group compared with medication treatment (three trials; data were not reported).

**Authors' conclusions**

Needling acupuncture was superior to sham acupuncture and medication therapy for reducing headache intensity, frequency and improving response rate.
CRD commentary
The review addressed a clear question with appropriate inclusion criteria. Some relevant sources were searched and attempts were made to reduce language bias. Two reviewers independently selected studies, assessed validity and extracted data, reducing the potential for reviewer bias and errors. Validity was assessed using published criteria and the results of the assessment were reported.

Data from some trials were combined in a meta-analysis, where controls were similar and heterogeneity assessed. However, there was evidence for statistical heterogeneity for some analyses; the authors reported differences between trials in acupuncture treatment, headache type and sham control designs. Some data were reported narratively, as control groups varied too greatly to be combined in a meta-analysis. Sample sizes were generally small in the included trials.

The authors’ conclusion of this well-conducted review is an accurate reflection of the results but, as they point out, due to differences between trials, the reliability is uncertain.

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

Research: The authors stated that further prospective, well-controlled, adequately powered RCTs, using multimodal regimens, are required to define the role of acupuncture for the management of chronic headache. Future studies should ensure that a validated instrument, such as SF-36, should be used to assess quality of life, and long-term outcomes should be considered.

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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.