Meta-analysis: acupuncture for osteoarthritis of the knee
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CRD summary
This review concluded that acupuncture showed clinical benefits compared to usual care and waiting-list for the treatment of knee osteoarthritis, and clinically irrelevant short-term benefits compared to sham. This was a generally well-conducted piece of research. The authors’ cautious conclusions reflected the limitations of the evidence and appeared reliable.

Authors’ objectives
To assess the safety and effects of acupuncture for the treatment of knee osteoarthritis.

Searching
MEDLINE, EMBASE and the Cochrane Central Register of Controlled Trials were searched to January 2007 for publications in any language. Search terms were broadly stated.

Study selection
Studies eligible for inclusion were: randomised controlled trials (RCTs) with an observation period of six weeks or more comparing acupuncture treatment with a sham, usual care (patients receive additional standard care therapy not provided to the acupuncture group) or waiting list control group (patients allowed to receive the current level of oral non-steroidal anti-inflammatory drug (NSAID) or analgesic therapy) in patients with diagnosed osteoarthritis of the knee reporting pain and function. Acupuncture treatment included the insertion of needles into traditional meridian points (with or without needle insertion into tender points) and could be electrically stimulated. Studies using dry needling or trigger-point therapy or only comparing two active forms of acupuncture were excluded.

Included studies were conducted in one or many practices in the USA, Europe and Thailand, and conducted by one or many acupuncturists. Included participants were mainly women aged between 60 and 69 years with a mean duration of pain from knee osteoarthritis of five years or more. The number of acupuncture sessions ranged from six to 23; treatment duration ranged from three to 26 weeks, with measurements taken at different time points. Some patients received co-intervention (diclofenac, placebo diclofenac, or physical therapy). Outcomes were measured using various tools including the visual analogue scale or Likert version of the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC).

Two reviewers independently screened studies for relevance, with disagreements resolved by discussion.

Assessment of study quality
Studies were assessed on quality using a previously published 11-item scale including adequacy of patient and outcome assessor blinding. A score of six or more indicated good quality.

The authors did not state explicitly how many reviewers performed the quality assessment and how discrepancies were resolved, but two acupuncturists assessed the adequacy of the acupuncture treatment, including aspects on: choice of acupuncture points, number of sessions, needling technique and experience of the acupuncturist.

Data extraction
Two reviewers independently extracted data on changes in pain and function for each treatment group to calculate the effect size using the standardised mean difference (SMD) (Hedge adjusted g), with their 95% confidence intervals (CIs). Where these data were not available, conservative assumptions were made to calculate the SMD. Where studies reported more than one pain or function outcome measure, results from the WOMAC were given preference. The number of serious adverse events for each treatment group was extracted. Authors were contacted for missing data and to check the accuracy of data extraction. Disagreements were resolved through discussion.
Methods of synthesis
A random-effects model was used to pool the effects of acupuncture according to type of control group and length of follow-up: short-term (eight weeks to three months) and long-term (three to six months). Pooled effects of acupuncture were assessed for clinically relevant effects, estimated as an SMD of 0.39 for WOMAC pain and 0.37 for WOMAC function. Heterogeneity was assessed using the I^2 test. Sensitivity analyses were undertaken for short-term outcome of sham-controlled RCTs of adequate quality, for funding source (industry versus non-industry) and for follow-up at six months. Publication bias was assessed using funnel plots and the Egger test.

Results of the review
Eleven RCTs (n=2,821, with 1,155 receiving acupuncture and 1,660 controls) were included in the review. There was a slight discrepancy between the total number of patients reported in the text and tables (total quoted is the figure given in the text). Sample sizes ranged from 30 to 1,039 participants. RCTs scored between four and 10 on the validity assessment, with seven (possibly eight) scoring six or more. Experience of acupuncturists was adequate in five RCTs, but adequacy assessments were partially unblinded.

Acupuncture compared with waiting list (four RCTs): clinically relevant short-term improvements in pain and function were reported by patients receiving acupuncture, SMD: -0.96 (95% CI: -1.21, -0.70) compared with patients on the waiting list, SMD: -0.93 (95% CI: -1.16, -0.69).

Acupuncture compared with usual care (two RCTs): clinically relevant short-term improvements in pain and function were reported by patients receiving acupuncture, SMD: -0.62 (95% CI: -0.75, -0.49) compared with patients receiving usual care SMD: -0.56 (95% CI: -0.69, -0.43). These improvements were maintained at six months for pain, SMD: -0.52 (95% CI: -0.66, -0.39) and function, SMD: -0.45 (95% CI: -0.59, -0.32).

Clinically irrelevant improvements were reported in the acupuncture groups compared to sham groups for pain and function outcomes in the short term (seven RCTs) and long term (three RCTs). There was evidence of significant heterogeneity in the short term for RCTs comparing acupuncture (I^2=66%) with sham (I^2=69%).

Sensitivity analyses on patient blinding and funding source significantly altered the results. SMD for function was no longer statistically significant and was borderline significant for pain (two RCTs).

Where reported, adverse events were similar for acupuncture and control groups, but pooling could not be undertaken due to heterogeneity. Funnel plots and the Egger test indicated potential small-study bias, but the Egger test results were not statistically significant.

Authors’ conclusions
Acupuncture produced clinically irrelevant short-term benefits in sham-controlled trials, but clinically relevant benefits compared to usual care and waiting-list controls for the treatment of knee osteoarthritis. Some benefits may be due to placebo or expectation effects. However, due to heterogeneity and small effects, current evidence should be regarded with caution.

CRD commentary
The review question and supporting inclusion criteria were clear. An adequate literature search was conducted using three electronic databases. There were no language restrictions, thus reducing the potential for language bias. Small-study bias was assessed using appropriate methods and assumptions were made about unidentified or unpublished RCTs, although this did not completely rule out the potential for publication bias. Validity, including acupuncture adequacy, was assessed using appropriate methods. Attempts were made to minimise the potential for reviewer error and bias for study selection and data extraction, but it was unclear how quality assessment was performed. Appropriate methods were used to pool the data and investigate potential sources of heterogeneity. However, the authors reported clinical and methodological differences, including sham interventions (which may not be true placebo treatments), settings and varying expertise of acupuncturists. This was a generally well-conducted piece of research. The authors’ cautious conclusions reflected the limitations of the evidence and appeared reliable.

Implications of the review for practice and research
Practice: the authors stated that current RCTs assessing long-term outcomes suggested that maintaining monthly acupuncture treatments in the months prior to assessment may be important. Some clinicians and patients may consider acupuncture as one of a number of treatments in a multidisciplinary approach to treating knee osteoarthritis, but it was too soon to recommend acupuncture as a routine part of care for patients with osteoarthritis.

Research: the authors stated that future sham-controlled RCTs should use physiologically inactive yet credible shams.

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Other publications of related interest

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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.