CRD summary
This review found mixed evidence for effectiveness of acupuncture in treatment or prevention of allergic rhinitis. There were suggestions of positive effects on perennial, but not seasonal, allergic rhinitis. Limitations in the studies included in the review and possible inappropriate statistical pooling of studies make the authors' conclusions uncertain.

Authors' objectives
To evaluate the effectiveness of acupuncture in the treatment or prevention of allergic rhinitis.

Searching
MEDLINE, AMED, British Nursing Index, CINAHL, EMBASE, PsycINFO, The Cochrane Library 2008 (Issue 4), six Korean medical databases and four Chinese databases (details provided in the paper) were searched from inception through September 2008 without language restrictions. Search terms were reported. References of retrieved articles and reviews were searched for additional articles. The authors' departmental files were handsearched. Conference abstracts and eight Korean traditional oriental medical journals and one other relevant journal were handsearched from inception to September 2008.

Study selection
Randomised controlled trials of needle acupuncture with or without electrical stimulation for treatment or prevention of allergic rhinitis (as sole or adjunctive treatment) compared with placebo, sham acupuncture, another comparator or no treatment were eligible for inclusion if they assessed clinically relevant outcomes. Eligible participants were diagnosed with allergic rhinitis (either seasonal or perennial) and could be of any age or either gender. Definitions of acupuncture and sham acupuncture were given in the review. Trials that tested other forms of acupuncture without needle insertion and trials that did not allow evaluation of effectiveness were excluded. Trials that combined two different forms of acupuncture in the intervention group were excluded.

The included studies were conducted in China, UK, Australia, Germany, Austria, Sweden, Italy and Korea. Most trials tested acupuncture for treatment rather than prevention of allergic rhinitis. Manual acupuncture was used in most trials; one used electroacupuncture. Comparators varied in the included studies: penetrating sham acupuncture at non-acupoints was used in most studies; others used sham acupuncture at acupoints, conventional pharmacological drugs, no treatment and routine care. Study designs included were two- and three-armed parallel trials and one crossover trial. Treatment regimens and duration varied between studies. The number of treatment sessions ranged from one to 30. Outcomes reported were subjective patient reports (diaries and questionnaires) that provided outcomes such as severity of symptoms (various scales) and objective measures, including total nasal volume and immunoglobulin E (IgE).

The authors stated neither how the papers were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
Methodological quality was assessed using a modified Jadad scale (which took into account that the acupuncturist could not be blinded). Randomisation, blinding of participants, evaluator blinding and handling of dropouts and withdrawals were assessed to give a score out of 5. Trials that scored 3 to 5 were deemed high quality. Allocation concealment was assessed using the Cochrane classification. The authors noted whether studies had used intention-to-treat analysis, if the study was published as an abstract only and whether sample size calculation was performed, and appeared to assess the suitability of statistics used.

Two reviewers assessed study quality. Disagreements were resolved by discussion or consultation with a third reviewer.

Data extraction
Data were extracted independently by three reviewers. For meta-analyses, means and standard deviations (SDs) were extracted for total nasal symptoms of perennial allergic rhinitis (manual acupuncture versus sham acupuncture). Standard mean differences (SMDs) and 95% confidence intervals (CIs) were calculated for each trial. The number of events was extracted for the response rate of perennial allergic rhinitis (manual acupuncture versus drug). Risk ratios (RRs) and 95% CIs were calculated for each trial. Adverse events were extracted. Authors were contacted for missing data.

Methods of synthesis
Studies were described narratively, grouped by type of allergic rhinitis and comparator treatments. In the absence of statistically significant heterogeneity, SMDs and RRs were pooled in random-effects meta-analyses. Statistical heterogeneity was assessed using $\chi^2$, $I^2$ and $\Gamma^2$ tests.

Results of the review
Twelve RCTs were included in the review ($n=1,831$). Methodologic quality was described as moderate: seven RCTs had a Jadad score of between 3 and 5, three scored 1 and two scored 2. Three trials reported allocation concealment. Four trials used an intention-to-treat analysis, sample size was calculated in four RCTs and the authors reported that one trial used uncertain statistics.

Seasonal allergic rhinitis: Three of four RCTs found no difference between acupuncture and sham acupuncture for prevention (one RCT) or treatment (two RCTs) of seasonal allergic rhinitis. One RCT found acupuncture was superior in treatment of seasonal allergic rhinitis. One RCT suggested acupuncture was superior to conventional medication for symptom relief, but no statistical details were provided.

Perennial allergic rhinitis: Four RCTs compared acupuncture with sham acupuncture and three of these reported improved symptoms or nasal symptoms with acupuncture; one RCT reported no difference in total nasal volume. Two of the positive RCTs were pooled in meta-analysis and suggested that acupuncture was associated with superior effects in nasal symptoms than sham acupuncture (SMD 0.45, 95% CI 0.13 to 0.78, $p=0.006; n=152$). This was not associated with statistical heterogeneity. These two RCTs also compared acupuncture with medication use, but there were no significant differences between treatments. There was no significant difference between drug therapy and acupuncture in responder rate when pooled in meta-analysis (two RCTs). This was associated with significant statistical heterogeneity ($\chi^2=8.91$, $p=0.003$, $I^2=89\%$).

The authors reported that most adverse events were of mild severity and were of similar frequency in the real and sham acupuncture groups.

Authors’ conclusions
There was mixed evidence for effectiveness of acupuncture for treatment or prevention of allergic rhinitis. Results for seasonal allergic rhinitis failed to show specific effects of acupuncture. For perennial allergic rhinitis, results provided suggestive evidence of effectiveness of acupuncture. However, the small number of RCTs and small total sample size did not allow firm conclusions to be drawn.

CRD commentary
The review question was supported by inclusion criteria for participants, intervention, outcomes and study design. All languages were eligible for inclusion, which reduced the possibility of language bias. It was unclear whether unpublished sources were searched and so the risk of publication bias was unknown. Multiple reviewers performed validity assessment and data extraction, which reduced the likelihood of reviewer error and bias; it was unclear whether similar steps were taken for study selection. Study quality was assessed using appropriate tools. Narrative synthesis appeared appropriate given the variety of interventions, comparators and outcomes. The reasons for pooling two of the four RCTs that compared sham acupuncture and acupuncture for perennial allergic rhinitis were unclear. Significant heterogeneity was not investigated in the meta-analysis of acupuncture versus medication for perennial allergic rhinitis. Many of the primary studies were of poor methodological quality. In light of the possible inappropriate pooling of studies and poor primary study quality, the authors’ conclusions may not be reliable.

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Oriental Medicine.

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

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

**Research:** The authors stated that future RCTs should evaluate larger patient samples for longer treatment periods and include sham controls.

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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.