

Ear-acupressure for allergic rhinitis: a systematic review

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Background: Allergic rhinitis affects 10–40% of the population globally with a substantial health and economic impact on the community.

Objective of review: To assess the effectiveness and safety of ear-acupuncture or ear-acupressure for the treatment of allergic rhinitis by reviewing randomised controlled trials and quasi-randomised controlled trials.

Type of review: This review followed the methods specified in the Cochrane Handbook for Systematic Reviews of Interventions.

Search strategy: A total of 21 electronic English and Chinese databases were searched from their respective inception to April 2008. Key words used in the search included the combination of ear, auricular, acupuncture, acupressure, acupoint, allergic, allergy, rhinitis, hayfever, randomised clinical trial and their synonyms.

Evaluation method: The methodological quality was assessed using Jadad's scale. The effect size analysis was performed to explore the difference between interventional groups.

Results: Ninety-two research papers were identified and seven of them referring to five studies met the inclusion criteria. All included studies involved ear-acupressure treatment. These studies mentioned randomisation, but no details were given. None of the five studies used blinding or intention-to-treat analysis. Ear-acupressure was more effective than herbal medicine, as effective as body acupuncture or antihistamine for short-term effect, but it was more effective than anti-histamine for long-term effect.

Conclusions: The benefit of ear-acupressure for symptomatic relief of allergic rhinitis is unknown due to the poor quality of included studies.

Allergic rhinitis, including seasonal allergic rhinitis and perennial allergic rhinitis, is an inflammatory condition involving the nasal mucous membrane. Allergic rhinitis sufferers account for 10–40% of population globally and the prevalence has increased in the last few decades.^{1–3} In Australia, allergic rhinitis is one of the most common long-term conditions and in recent years, the proportion of adults with allergic rhinitis in Australia has increased from 13.9% in 1995 to 16.1% in 2004–05.⁴ Allergic rhinitis has a significant impact on quality of life, work/school performance and productivity.⁵ It causes a significant economic burden as well.^{5,6} Allergic rhinitis is associated with asthma, sinusitis and other co-morbidities, such as conjunctivitis.¹

The current management of allergic rhinitis includes avoidance of exposure to allergens, pharmacological

treatment, immunotherapy and patient education.¹ Medications include oral and topical histamine H₁ receptor antagonists, topical and systemic glucocorticosteroids, chromones, decongestants, topical anti-cholinergics, anti-leukotrienes and oral anti-allergic drugs. However, these medications are associated with certain undesirable side-effects and, frequently, do not provide complete symptomatic relief.¹ In recent years, there is a worldwide trend among allergic rhinitis sufferers to seek complementary and alternative medicine (CAM) treatment⁷ with a number of systematic reviews that evaluate the therapeutic benefits of herbal medicine⁸ and acupuncture.⁹ Specifically, acupuncture has been demonstrated to be effective for seasonal allergic rhinitis¹⁰ and perennial allergic rhinitis,^{11–13} while Chinese herbal medicine has also been shown to be beneficial for seasonal allergic rhinitis¹⁴ and perennial allergic rhinitis.¹⁵ The cost-effectiveness of acupuncture treatment of perennial allergic rhinitis was also evaluated in a large-scale trial.¹⁶ It was demonstrated in terms of an international benchmark namely the cost per

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quality-adjusted life year that acupuncture was cost-effective.¹⁶

From a traditional Chinese medicine perspective, it is considered that all the major energy lines (meridians where acupuncture points are situated) are directly or indirectly connected to the ear.¹⁷ Therefore, points of the ear are sensitive acupuncture treatment sites for a range of clinical conditions, including allergic rhinitis.¹⁷ Ear-acupuncture has a long history of use in clinical practice in China.¹⁷ However, due to the anatomical structure of the ear, needling is not commonly used because of the relatively higher risk of skin infection and degree of discomfort than for body acupuncture.¹⁷ Therefore, ear-acupressure is commonly used as an alternative stimulation method on ear acupoints.

As a non-invasive alternative, ear-acupressure uses small seeds or metal pellets on ear points to stimulate them regularly and mildly. A number of recent clinical trials have demonstrated the therapeutic potential of ear-acupuncture or ear-acupressure in the treatment of a range of conditions, such as pain,¹⁸ psychological and physical discomfort associated with drug use,¹⁹ cocaine abuse,²⁰ anxiety,²¹ simple obesity,²² insomnia²³ and diabetes.²⁴

In addition, ear-acupressure has been used widely for allergic rhinitis management and a number of clinical studies showed positive findings.^{25–31} However, there has been no systematic review that evaluates the current evidence of ear-acupressure for allergic rhinitis. This review aims to determine the effectiveness and safety of ear-acupressure for treating allergic rhinitis by reviewing currently available randomised clinical trials (RCTs) and quasi-RCTs.

Methods

This review followed the methods specified in the Cochrane Handbook for Systematic Reviews of Interventions 4.2.6.³²

Search strategy

A total of 21 electronic English and Chinese databases were searched from their respective inception to April 2008. The databases searched are as follows: Cochrane Central Register of Controlled Trials, PubMed, EMBASE, CINAHL, Informit, Science Direct, LILACS (Latin American and Caribbean Health Sciences), ProQuest, AMED, Blackwell Synergy, PSYCINFO, PANTELEIMON, Acubriefs, Koreamed, INDMED, Ingenta, mRCT, ISI web of knowledge, ERIC, VIP Information (<http://www.cqvip.com>) and China National Knowledge Infrastructure

(<http://www.cnki.net>). Throughout the search process, the following key words were used: the combination of ear, auricular, acupuncture, acupressure, acupoint, allergic, allergy, rhinitis, hayfever, randomised clinical trial and their synonyms.

Study selection

RCTs and quasi-RCTs were considered regardless of language or publication types. Patients with allergic rhinitis of any age or gender were included. Any type of ear-acupuncture or ear-acupressure (such as needles inserting into ear acupoints, electric stimulation on the ear acupoints, seeds or magnetic pellets attached on ear acupoints, or prick blood-letting technique on ear acupoints) compared with any of the following control interventions for treating allergic rhinitis were included: sham/placebo, no intervention, acupuncture, Chinese herbal medicine or conventional therapies. Co-intervention is allowed as long as all the arms have the same co-intervention involved.

All titles and abstracts of identified articles were initially screened independently by two authors (CZ and AY). When needed, the full-text articles were obtained for further screening for inclusion in this review by these two authors. Any disagreement between two authors was resolved by the third party (CX). Full texts of all included studies were obtained and their quality was assessed (see below).

Methodological quality assessment, data extraction and data analysis

Two authors (CZ and AY) independently assessed the methodological quality of the included studies using the Jadad Scale.³³ This is a six-point scale (0 to 5) for assessing methodological quality of clinical trials with respect of randomisation, blinding and withdrawals. The scoring method is as follows: if the study described details of randomisation, blinding and methods dealing with withdrawals, one score is given to each of the three items. If the randomisation method is appropriate and the blinding is adequate, one additional score is allocated to each of the two items. However, study with inappropriate randomisation and/or inadequate blinding, one score is deducted for each of the two items.

CZ and AY also extracted data of included studies including study setting, sample sizes, the treatment and control interventions, outcomes and adverse events. Any discrepancy between the two authors was resolved by the third party (CX) through discussion. The heterogeneity of the studies was interpreted through the characteristics of interventions. We performed the effect size analysis to

explore the differences between interventional groups. Dichotomous data were expressed as risk ratio (RR) with 95% confidence interval (CI).

Results

Of the 92 studies identified, seven papers^{25–31} based on five studies were included. On two occasions, disagreement between the two authors as to whether a study should be included, necessitated a third and deciding vote. The study selection process is shown in the Fig. 1 below.

Characteristics of included studies

All five studies were conducted in mainland China and published in the language of Chinese. The study sample sizes range from 66 to 400. A total of 804 participants with allergic rhinitis, aged from 5 to 66 years, were randomised and 796 participants were analysed in these five original studies. In the study by Rao & Han (2006)²⁸, eight subjects discontinued during the treatment period and thus they were not included in the data analysis.

Of the included studies, Rao & Han (2006)²⁸ and Ye *et al.* (2008)³⁰ mentioned diagnostic criteria; however, none of the studies stated the detailed inclusion or exclusion criteria. The number of treatments and their total duration varied in these studies, ranging from 5 to 30 times and 18 to 84 days respectively. Rao & Han (2006)²⁸ and Ye *et al.* (2008)³⁰ mentioned a 6-months follow-up period. In terms of the stimulation methods, all these five included studies involved ear-acupressure as the active treatment intervention. Ye *et al.* (2008)³⁰ used magnetic pellets to press the ear points; Wang (2004)²⁹ and Ye *et*

al. (2008)³⁰ used Semen Vaccariae (cow soapwort seed or *Wang Bu Liu Xing*); whilst the remaining two studies Huo (2003)²⁵ and Kong *et al.* (2006)²⁶ did not provide the details of instruments used for ear-acupressure. Among the total 14 ear points used in these five studies, *Lung* (CO₁₄) was used in all the studies, *Spleen* (CO₁₃) in four studies and *Nei Bi* (TG₄), *Wai Bi* (TG_{1,2i}), *Shen-shangxian* (TG_{2P}), *Liver* (CO₁₂), *Kidney* (CO₁₀), *Eye* (LO₅) in three studies.

Concerning the interventions used for the control group in the five studies, Kong *et al.* (2006)²⁶ and Wang (2004)²⁹ compared ear-acupressure with Chinese herbal medicine tablets; Huo (2003)²⁵ compared ear-acupressure with body acupuncture; Ye *et al.* (2008)³⁰ compared ear-acupressure plus body acupuncture with body acupuncture alone; while Rao & Han (2006)²⁸ three-armed trial compared ear-acupressure with body acupuncture or an anti-histamine medication (*cetirizine*).

With regard to outcome measures, four out of five studies only used percentage of effectiveness as their outcome measure.^{25,26,29,30} The ‘percentage of effectiveness’ was calculated as: the number of cases experienced allergic rhinitis symptom improvement after treatment divided by the total number of cases in the group then multiplied by 100%. That is, all patients experienced any symptom improvement, from marked improvement to minor improvement, are all included.

Only one study²⁸ used the percentage of cases with symptom severity score reduction as the outcome measure. This percentage was calculated as [(Total symptom severity score before treatment – total symptom severity score after treatment)/Total symptom severity score before treatment] × 100%. The cases with more than 20% of symptom severity score reduction were considered effective. In addition to this scoring method, Rao & Han (2006)²⁸ measured total serum IgE, IL-4, and IFN- γ . The detailed characteristics of included studies are summarised in Table 1.

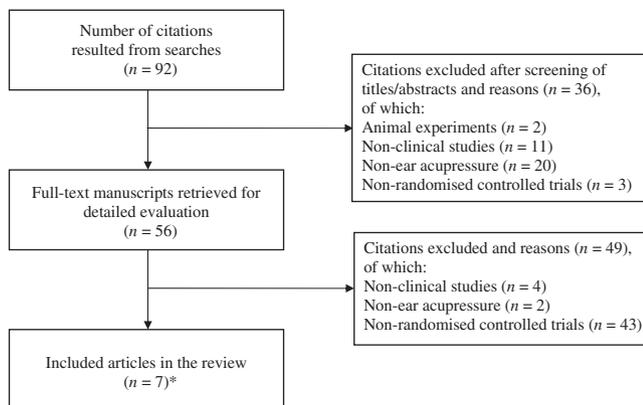


Fig. 1. Flow chart of the study selection process. *Seven papers based on five studies were included in this review.

Methodological quality of included studies

Randomisation was claimed in all the studies. However, Huo (2003)²⁵ used the odd/even alternative allocation method for randomisation and the rest did not give details of randomisation methods used. None of the five studies provided information of blinding. In addition, none of them applied the sham/placebo control method or to intention-to-treat analysis. Only Rao & Han (2006)²⁸ study reported dropouts/withdrawals. Therefore, the Jadad scores of included studies ranged from 0 to 2. Only Rao & Han (2006)²⁸ study was scored as 2. The detailed Jadad scores of the included studies are provided in Table 1.

Table 1. Characteristics and methodological quality assessment of included studies

Comparison of interventions	Study	Jadad's score	Sample size		Results (T/C)	Effect size RR (95% CI)
			Treatment n (age)	Control n (age)		
Ear-acupressure <i>versus</i> Chinese herbal medicine	Kong <i>et al.</i> 2006 ²⁶ Wang 2004 ²⁹	1 1	54 (14–62) 300 (5–59)	54 (14–62) 100 (5–59)	Percentage of effectiveness* (92.6%/70.4%) Percentage of effectiveness* (99%/40%)	1.32 (1.09, 1.59) 2.48 (1.95, 3.15)
Ear-acupressure and body acupuncture <i>versus</i> body acupuncture alone	Ye <i>et al.</i> 2008 ³⁰	1	40 (10–61)	40 (10–61)	Percentage of effectiveness* (97.5%/80.0%)	1.22 (1.04, 1.43)
Ear-acupressure <i>versus</i> body acupuncture or anti-histamine (for Rao & Han 2006 ²⁸ only)	Huo 2003 ²⁵ Rao & Han 2006 ²⁸	0 2	30 (22–65): 17 in subgroup 1; 13 in subgroup 2 50 (13–65), 1 dropout	36 (20–62): 22 in subgroup 1; 16 in subgroup 2 Body acupuncture group: 50 (20–66), 3 dropouts; Anti-histamine group: 50 (16–65), 4 dropouts	Subgroup 1: Percentage of effectiveness* (90.9%/64.7%) Subgroup 2: Percentage of effectiveness* (64.3%/100%) Ear-acupressure <i>versus</i> body acupuncture: Percentage of cases with symptom severity score reduction > 20%, short-term (after treatment): (93.88%/95.75%); Long-term (6 months follow-up): (58.97%/69.05%)	Subgroup 1: 1.40 (0.97, 2.04); Subgroup 2: 0.66 (0.44, 0.98); All patients: 1.01 (0.79, 1.28) Short-term: 0.98 (0.89, 1.08); Long-term: 0.85 (0.61, 1.19)
					Ear-acupressure <i>versus</i> anti-histamine: Percentage of cases with symptom severity score reduction > 20%, short-term (after treatment): (93.88%/97.83%); Long-term (6 months follow-up): (58.97%/19.51%)	Short-term: 0.96 (0.88, 1.04); Long-term: 3.02 (1.54, 5.93)

RR, risk ratio; CI, confidence interval; T, treatment; C, control.

*Percentage of effectiveness = (the number of cases experienced allergic rhinitis symptom improvement after treatment ÷ the total number of cases included in the study group) × 100%.

Clinical effectiveness

Kong *et al.* (2006)²⁶ and Wang (2004)²⁹ reported that the ear-acupressure produced a significantly higher percentage of effectiveness comparing with Chinese herbal medicine (RR, 1.32; 95% CI 1.09, 1.59 and RR, 2.48; 95% CI 1.95, 3.15). Rao & Han (2006)²⁸ showed that ear-acupressure was not better than body acupuncture (RR, 0.98; 95% CI 0.89, 1.08) or anti-histamine (*cetirizine*) (RR, 0.96; 95% CI 0.88, 1.04) in a short term (4 weeks) based on the percentage of cases with symptom severity score reduction. However, this study showed that ear-acupressure has a significantly better long-term (6 months) effect than anti-histamine medication (RR, 3.02; 95% CI 1.54, 5.93). Rao & Han (2006)²⁸ also reported that both acupuncture and ear-acupressure had similar short-term effect (no data available for long-term follow-up) as anti-histamine in reducing the total serum IgE ($P < 0.01$) and IL-4 ($P < 0.05$).

Another study demonstrated that when ear-acupressure combining with body acupuncture, the combined effects were superior to those from body acupuncture alone (RR, 1.22; 95% CI 1.04, 1.43).³⁰

Huo (2003)²⁵ concluded that ear-acupressure had better effects than body acupuncture treatment for subjects with *Lung and Spleen Qi deficiency* syndromes. However, this is not the case for subjects with *phlegm-heat and blood stasis* when compared with body acupuncture (RR, 0.66; 95% CI: 0.44, 0.98). When subjects of the subgroups are combined, the two treatments showed similar clinical outcomes (RR, 1.01; 95% CI: 0.79, 1.28).²⁵

Adverse events reported in the included studies

Kong *et al.* (2006),²⁶ Rao & Han (2006)²⁸ and Wang (2004)²⁹ indicated that there were no adverse events related to the ear-acupressure treatment. The other two studies^{25,30} did not provide the relevant information.

Discussion & conclusions

This review shows that only a small number RCTs of ear-acupressure for allergic rhinitis are available and all of these studies were conducted in China. All the included studies used non-invasive (no skin penetration was involved) mechanical stimulation methods on the ear-acupuncture points, such as seeds or magnetic pellets. With regard to the control interventions, two studies comparing ear-acupressure with Chinese herbal medicine, two studies comparing ear-acupressure with body acupuncture and one study comparing body acupuncture as well as an antihistamine medication (*cetirizine*). These

studies demonstrated positive results for ear-acupressure when comparing with Chinese herbal medicine (for the short term) or anti-histamine (for the long term); however, conclusion cannot be drawn due to a number of methodological flaws.

Consistent with a recent review on CAM for rhinitis and asthma,³⁴ the methodological quality of included studies is low. None of them provided adequate information on appropriate methods used for randomisation or concealment of allocation. Neither blinding techniques nor sham/placebo ear-acupressure control was applied to any of the included studies. Selection criteria of participants were not clearly described in any included studies. Only Rao & Han (2006) study²⁸ used a symptom scoring method to measure the severity of symptoms. Quality of life improvement or reduction of medication usage, widely used in other RCTs of allergic rhinitis in the English literature^{10,11,14,15} was not used as outcome measures in any of the included studies. In addition, only Rao & Han (2006) study²⁸ included laboratory serum tests. Due to the significant methodological weaknesses, the summarised results from this review must be interpreted with caution.

Overall, ear-acupressure appears to have a significantly higher percentage of effectiveness than that produced by Chinese herbal medicine. When comparing with body acupuncture, two studies^{25,28} reported ear-acupressure had similar effectiveness as body acupuncture whereas another study³⁰ concluded that the effect of combining ear-acupressure with body acupuncture was better than using body acupuncture alone. On the other hand, the effect of ear-acupressure was not better than anti-histamine medication in the short term, but there was a significantly better long-term effect as reported in one study.²⁸

Compared to standard needle acupuncture, three studies^{26,28,29} showed no adverse events associated with ear-acupressure. This may be due to the fact that no skin penetration was involved in these studies. The strength of this review is that authors have accessed studies that are not available in English databases and performed the review according to the rigorous methodology specified in Cochrane Handbook for Systematic Reviews of Interventions.

In conclusion, the existing evidence indicated that ear-acupressure was well tolerated by patients with allergic rhinitis. Although ear-acupressure has showed some promising positive effects for symptomatic relief of allergic rhinitis, the findings should be carefully interpreted due to the low methodological quality of the included trials. To provide reliable evidence to guide clinical practise, more rigorously designed RCTs of ear-acupressure for allergic rhinitis are required.

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Conflict of interest

None declared.

Keypoints

- There is increasing use of complementary therapies including acupuncture for allergic rhinitis.
- Ear-acupressure may be used as an alternative to acupuncture;
- This review showed that ear-acupressure was not less effective than acupuncture or antihistamines;
- The true benefit of ear-acupressure is yet to be determined due to poor quality of the included studies.

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