Herbal medicines for the treatment of COPD: a systematic review
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CRD summary
This review found no conclusive evidence of the effectiveness of herbal medicines for the treatment of chronic obstructive pulmonary disease. The evidence from studies was scarce and often methodologically weak. The authors’ cautious conclusions correctly reflect the poor quality trials and paucity of data on this topic.

Authors' objectives
To evaluate the effectiveness of herbal medicines for the treatment of chronic obstructive pulmonary disease (COPD).

Searching
AMED, MEDLINE, EMBASE, CINAHL and the Cochrane Library were searched from inception to August 2005. No language restrictions were applied. Search terms were reported. Handsearching of some journals was conducted. Three manufacturers were contacted for further relevant data. Also, reference lists of all included studies and other relevant reviews were scanned for potential studies.

Study selection
Randomised controlled trials (RCTs) evaluating herbal preparations systematically administered for chronic bronchitis, emphysema or chronic obstructive pulmonary disease compared to placebo, no treatment, conventional therapy or other herbal medicines were eligible for inclusion. Studies of participants of either sex and of any age were eligible for inclusion. To be included trials had to assess clinical outcomes such as forced expiratory volume in one second (FEV₁), global clinical assessment of effectiveness, symptom scores, health related quality of life, exacerbation severity and frequency. Trials with asthma patients were excluded.

The majority of included trials assessed herbal mixtures, but a few tested herbal mono-preparations. The botanical components of the herbal medicines were reported in the review (appendix). Herbs were delivered as injections, granules, syrups or decoctions. Duration of treatment ranged from six days to 90 day and duration of follow-up ranged from six days to 365 days. Included participants had been diagnosed with chronic bronchitis, chronic obstructive pulmonary disease or acute exacerbation of chronic bronchitis. The age of included participants ranged from one to 80 years. Outcomes reported were: responder rates; functional capacity (FEV₁, vital capacity); symptom score; exacerbation severity and days of exacerbation. Adverse events were also reported for some of the included trials.

Two reviewers independently assessed validity and resolved disagreements through discussion and, if necessary, by recourse to a third reviewer.

Assessment of study quality
Validity was assessed using the Jadad scale (maximum possible score was 5 points).

Two reviewers independently assessed validity and resolved disagreements through discussion.

Data extraction
Data on outcomes and adverse events were extracted by two reviewers. Missing data were requested from authors where necessary. Data from the primary outcomes of individual studies was used to calculate the effect sizes and 95% confidence intervals. The weighted mean difference was calculated for continuous data such as forced expiratory volume in one second (FEV₁), vital capacity, symptom score, and exacerbation frequency and severity. The risk ratio was calculated for dichotomous data such as responder rates.

Methods of synthesis
Trials were grouped according to the type of control intervention and combined in a narrative synthesis. Additional data were presented in tables.

Results of the review
Fourteen RCTs (1,359 patients) were included in the review. Methodological quality was rated as low with a mean Jadad score of 2. One RCT scored 5, four RCTs scored 3, two RCTs scored 2, and seven RCTs scored 1. Three RCTs reported methods of randomisation; five RCTs reported double blinding, with only one reporting an appropriate method of blinding; five RCTs reported drop-outs and withdrawals, two RCTs were placebo controlled.

**Herbal medicines versus placebo or no treatment** (six RCTs): All studies used conventional therapy in both the intervention and control groups.

Shen Mai: Significant improvements were reported for Shen Mai injection (three herbs with Panax ginseng as the main ingredient) compared to no treatment for forced expiratory volume in one second (FEV$_1$) (weighted mean difference 0.58, 95% CI: 0.19 to 0.97; one RCT, 38 patients), vital capacity (weighted mean difference 1.64; 95% CI: 0.98, 2.30), responder rate (risk ratio 3.90, 95% CI: 1.32 to 11.51) and the Borg scale symptom score (weighted mean difference -1.20, 95% CI: -2.02 to -0.30).

Panax ginseng: There was insufficient data to calculate an effect size for one RCT (n=92 patients) comparing Panax ginseng extract with placebo.

Salvia miltiorrhiza: A significant difference was reported for Salvia miltiorrhiza (Danshen) injection compared with no treatment for FEV$_1$ (weighted mean difference 0.53, 95% CI: 0.36 to 0.70; one RCT, 53 patients). However no significant differences were reported between groups for responder rate.

Jiawei Yupingfeng: A significantly higher responder rate was reported for Jiawei Yupingfeng compared with no treatment (risk ratio 1.44, 95% CI: 0.80 to 2.58; one RCT, 84 patients).

Jinshui Liujin: No statistically significant differences between Jinshui Liujin decoction and no treatment were found between groups for responder rate, FEV$_1$ or vital capacity (one RCT, 82 patients).

Echinacea: No statistically significant differences were reported for FEV$_1$ comparing Echinacea based liquid extract (Esberitox N) to placebo (one RCT, 53 patients, text and tables differ).

**Herbal medicine versus conventional therapy** (one RCT):

Hedera helix versus ambroxol: No statistically significant differences were found comparing Hedera helix leaf extract (Prospan) with conventional therapy of ambroxol tablets (one RCT, n=94 patients).

**Herbal medicine versus herbal medicine** (seven RCTs):

Ke Chuan Ping versus Qing Jin Hua Tan: Statistically significant improvements were reported for Ke Chuan Ping decoction compared to Qing Jin Hua Tan decoction for responder rate (risk ratio 1.62, 95% CI: 1.00 to 2.61) but not for FEV$_1$ (one RCT, 62 patients).

13 herb anti-cough dyspnoea versus Ephedra-almond: Statistically significant improvements were reported for 13 herb anti-cough dyspnoea decoction compared to Ephedra-almond decoction for responder rate (risk ratio 2.77, 95% CI: 1.96 to 3.93; one RCT, 400 patients).

Yiqi Mianyi versus Zhenqi Fuzheng: Statistically significant improvements were reported for Yiqi Mianyi granules compared to Zhenqi Fuzheng granules for responder rate (risk ratio 1.96, 95% CI: 1.15 to 3.34) and for symptom score (weighted mean difference -2.70, 95% CI: -5.57 to -0.17; one RCT, 102 patients).

Bufei Keli versus Yupingfeng Keli: Statistically significant improvements were reported for Bufei Keli granules compared to Yupingfeng Keli granules for responder rate (risk ratio 1.71; 95% CI: 1.11 to 2.64), symptom severity score (weighted mean difference -1.03, 95% CI: -2.03 to -0.03) and days of exacerbation (weighted mean difference -7.20, 95% CI: -11.50 to -2.90; one RCT, 62 patients).

Kensuning versus Jinbei Tankeqing: One RCT (n=120) comparing Kensuning granule and placebo with Jinbei Tankeqing granule found no significant differences between groups for responder rates.
Gubenhuatanquyu versus Buyiguben: Symptom scores were statistically significantly improved in a group using Gubenhuatanquyu decoction compared to a group using Buyiguben decoction (weighted mean difference -2.00, 95% CI: -3.88 to -0.12; one RCT, 65 patients).

Two forms of Hedera helix extract (Prospan): No statistically significant differences were found for Prospan cough syrup compared with Prospan herbal drops for FEV$_1$ or vital capacity (one RCT, 50 patients).

Adverse events were reported in the review.

**Authors' conclusions**

No conclusive evidence of the effectiveness of herbal medicines for the treatment of chronic obstructive pulmonary disease was found. The evidence from studies was scarce and often methodologically weak.

**CRD commentary**

Inclusion criteria were clearly defined for study design, interventions, outcomes and participants. Several relevant sources were searched with no language restrictions. Some attempts were made to minimise the potential for publication bias. Two reviewers independently selected trials, assessed validity and extracted data, thus reducing the potential for reviewer bias and errors. Validity was assessed using specified criteria and results of the assessment were reported. In view of the differences between studies, a narrative synthesis with trials grouped by type of control intervention was appropriate.

The authors appropriately reported limitations of the review, including low methodological quality of the included studies, small sample sizes and concomitant conventional therapy for a number of trials. They also acknowledged that half of the included trials compared one herbal medicine with another, making it difficult to interpret the results due to the unknown effects of the "control" intervention. Consequently the authors' cautious conclusions correctly reflect the poor quality of trials and paucity of data on this topic.

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

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

**Research:** The authors stated that further rigorously designed studies are needed to evaluate the effectiveness of herbal medicines for the treatment of chronic obstructive pulmonary disease. Further studies are required to monitor herb-drug interactions and safety of remedies.

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