Herbal interventions for chronic asthma in adults and children (Review)

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[Intervention Review]

Herbal interventions for chronic asthma in adults and children

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ABSTRACT

Background

Herb and plant based preparations are a popular treatment for asthma, although there remain concerns as to their efficacy and safety. In Western societies, motivations for using such treatments may be both positive and negative, with their perceived safety and dissatisfaction with conventional medicine among them. In China such treatments are more commonly used and many compounds considered 'conventional' are derived from herbs or plants.

Objectives

To assess the efficacy and safety of herb and plant extracts in the management of chronic asthma.

Search methods

The Cochrane Airways Group Trials Register, CENTRAL, MEDLINE, EMBASE and AMED were searched with pre-defined terms. Searches are current as of February 2007.

Selection criteria

Randomised placebo controlled trials of any herb or plant extract were eligible. Study participants had to have a primary diagnosis of asthma. Studies in both adults and children were eligible for the review.

Data collection and analysis

Two reviewers assessed studies for suitability. Data were extracted and double-checked.

Main results

Twenty-seven studies (29 experimental groups) met the review entry criteria, randomising a total of 1925 participants. The studies identified assessed the effects of 21 different herbal preparations. Study quality varied considerably, and the sample sizes were often small. For primary outcomes (exacerbations, steroids use and lung function measurements): Two out of six studies reporting change in FEV1 were positive, with very few data available on the frequency of exacerbations. One study which did report these data was negative. Health-related quality of life was only measured in one trial.

Authors' conclusions

The evidence base for the effects of herbal treatments is hampered by the variety of treatments assessed, poor reporting quality of the studies and lack of available data. The data that are available from the studies provide only a small insight into the long-term efficacy and harm profiles of these treatments. The absence of common endpoint measurements limits the validity of our findings further. Positive findings in this review warrant additional well-designed trials in this area.

PLAIN LANGUAGE SUMMARY

Herbal interventions for chronic asthma in adults and children

Chronic asthma is a inflammatory disease of the airways characterised by wheeze and breathlessness. Drug therapy is usually used to control symptoms but complementary medicine is often used, including herbal treatments, and the efficacy and safety of such treatments is not clear. We reviewed evidence from 27 trials covering 21 different herbal treatments in both adults and children from both in-patient and out-patient settings. In general, the reporting of trials was poor. The outcomes measured by the trials varied considerably which made it difficult to compare the results of studies that did look at the same treatment. On the basis of the available evidence it is not possible to show whether any of these herbal treatments can improve asthma symptoms. Further trials of high quality are needed to assess the use of herbal treatments in asthma.

BACKGROUND

Asthma is a chronic inflammatory disease of the airways characterised by wheeze, breathlessness and airflow limitation (BTS/SIGN 2005). Drug therapy is normally used to control symptoms. However the use of complementary or alternative medicine (CAM) is widespread. In a UK survey of National Asthma Campaign members, only 41% said that they had *not* used CAM and of those 41%, 67% said that they would consider using CAM for their asthma in the future. The most popular forms of CAM in the study population were breathing techniques, homeopathy and herbalism (Ernst 1998). A survey of CAM use in asthma or rhino sinusitis sufferers in the USA found that 42% of the study population had used some form of CAM for their condition in the 12 months prior to the study. Herbal treatments emerged as being the most commonly reported form of CAM being used (Blanc 2001). Another US survey of CAM use found that allergies and lung problems ranked as some of the most frequently reported medical conditions that CAM is used for, and the most popular forms of CAM for these conditions were herbs, relaxation and spiritual healing (Eisenberg 1998).

Why then, when there are effective treatments available for asthma do people turn to complementary or alternative medicine, especially given that evidence in support of treatments such as acupuncture and homeopathy are weak (McCarney 2003; McCarney 2004)? The reasons for people turning to CAM can be divided into positive and negative motivations (Ernst 2000; Ernst 2005). Positive motivations include perceived effectiveness and safety; 'spiritual' or holistic nature of the therapy; personal control over treatment; good relationship with the therapist; and accessibility. Negative reasons include dissatisfaction with conventional methods; rejection of the 'establishment'; and desperation. A study into the beliefs and motivations of CAM users in Canada supports this theory. It found the two main reasons people used CAM were that it allows them to take a more active role in their health, and a feeling that conventional medicine was not effective for their health condition (Sirois 2002).

As shown by Blanc 2001; Eisenberg 1998; and Ernst 1998, herbal therapy is a popular form of CAM in asthma. There is a long history of using herbs to treat asthma and a number of asthma drugs have their origins in herbal remedies. For example, ephedrine was developed from the traditional Chinese herbal remedy 'ma huang', and tea leaves are the herbal origin of theophylline (Ziment 2000). Caffeine, found in tea and coffee, is a member of the same family as theophylline, and has been used for centuries as a treatment for asthma. A recent Cochrane review found that it improved lung function for up to four hours after ingestion (Bara 2001). There are many different herbs and herbal preparations that are used to treat asthma and each culture has its own approach. Table 1 shows examples of herbs used for the treatment of asthma by culture. Western cultures use products from local plants but also borrow from Eastern cultures (Graham 2000). Herbal interventions for asthma are often used in addition to conventional medicine (Bielory 1999; Clement 2005) rather than as a sole agent.

One of the positive motivations for using CAM is perceived safety. However there are risks with the use of herbal remedies including drug interactions, inconsistent dosing, contamination and natural toxicity (Graham 2000). Drug interactions could be a particular concern as a survey of herbal therapy users found that 81% also used conventional medicines (Barnes 1996). Barnes 1998 also found that herbal remedy users would be less likely to consult their GPs for suspected adverse events to a herbal remedy than they would for a conventional over-the-counter medicine. In fact, herbal therapy users tend to self-medicate or take the advice of a friend or relative (Barnes 1996; Clement 2005) so are unlikely to consult any practitioner at all on the use of herbal products.

Whether herbal products are actually effective in the treatment of asthma is uncertain. A systematic review of herbs for asthma conducted in 2000 (Huntley 2000) found 17 randomised controlled trials: six assessing traditional Chinese herbs; eight assessing traditional Indian remedies; one assessing a Japanese herbal preparation; one assessing dried ivy-leaf extract, and one assessing use of marijuana. They found the methodological quality of the trials was poor and concluded that herbal products are of "uncertain value in the treatment of asthma". However, they also concluded that were some "promising data". Given the high usage of herbal products among people with asthma, a new assessment of the current evidence is needed.

OBJECTIVES

To determine the effectiveness of herbal therapies as a sole agent or in addition to pharmacological therapy in the management of chronic asthma.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised or quasi-randomised controlled trials (RCTs) are included.

Types of participants

Adults and children over five years old with a diagnosis of chronic asthma of all severities. Diagnosis should be confirmed on the basis of symptoms and lung function assessment.

Types of interventions

For the purposes of this review, herbal medicine is defined as the use of plants or plant extracts to treat disease. The products may be derived from the leaves, stems, buds, roots, fruit or bark (Bielory 1999) and administered in a number of different ways. Given the nature of asthma, any substances that are taken by inhaling smoke will be excluded, but other than that there will be no limitation on the method of administration. Single chemicals extracted from a plant, or synthetic chemicals based on plant constituents will be excluded (e.g. ephedrine from *Ephedra sinica* (ma huang) or atropine from *Atropa belladonna* (deadly nightshade)).
The intervention may be a single herb or a mixture of herbs given either as a sole agent or in addition to usual treatment, with a placebo control. This review does not consider trials that compare one herbal intervention with another, or herbs with any other 'complementary' treatment, such as homeopathy or acupuncture.

Types of outcome measures

Primary outcomes:

- Lung function
- Exacerbations
- Reduction in use of corticosteroids

Secondary outcomes:

- Symptoms and symptom score
- Use of reliever medications
- Health related quality of life (QoL)
- Changes in rates of consultation
- Adverse effects
- Withdrawal or drop-out rates

Search methods for identification of studies

1) Electronic searches
The following databases were searched for reports of RCTs:

- The Cochrane Airways Group Specialised Register
- Cochrane Complementary Medicine Field Specialised Register
- The Cochrane Central Register of Controlled Trials (CENTRAL)
- MEDLINE (1966 to present)
- OLDMEDLINE (1950 to 1965)
- EMBASE (1980 to present)
- AMED (1985 to present)
- HerbMed
- Chinese Biomedical Database (1975 to 2006)
- China National Knowledge Infrastructure (1979 to 2006)
- VIP database (1979 to 2006)
- Ongoing trial registries such as the UK National Research Register, Clinicaltrials.gov etc.

Records in the Airways Register coded as 'asthma' were searched with the terms:
herb* or plant* or phyto* or botanic* or ((tradition* or chinese*) and medicine*) or ayurvedic* or kampo*
The following search was used in CENTRAL and adapted for use in other databases (see Table 2):
#1 ASTHMA (MeSH)
#2 asthma*
#3 wheez*
#4 bronchospas*
#5 bronch* NEAR spas*
#6 bronch* NEAR constrict*
#7 bronchoconstrict*
#8 #1 or #2 or #3 or #4 or #5 or #6 or #7
#9 MEDICINE, HERBAL (MeSH)
#10 PLANT PREPARATIONS (MeSH)
#11 PLANTS, MEDICINAL (MeSH)
#12 PHYTOTHERAPY (MeSH)
#13 MEDICINE, TRADITIONAL (MeSH)
#14 herb*
#15 plant*
#16 phyto*
#17 botanic*
#18 tradition* NEAR medicine*
#19 chinese* NEAR medicine*
#20 ayurvedic*
#21 kampo*
#22 #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21
#23 #8 AND #22

2) Other sources

The reference lists of review articles and primary studies were checked for additional trials. Authors of studies were contacted for further information if necessary. Manufacturers and experts in the CAM field were contacted for any unpublished data. Contact was made with the Cochrane Complementary Medicine Field and the Chinese Cochrane Centre, and special interest groups such as the National Asthma Campaign and British Lung Foundation.

Data collection and analysis

Selection of studies

The results of the literature search were screened by two review authors. At the first stage potentially relevant trials were identified on the basis of their title, abstract and keywords. The full-text was then obtained and assessed for inclusion or exclusion in the review. Trials were not excluded on the basis of language and translations were obtained where possible.
Any disagreement between the authors was resolved by discussion or where necessary by referral to a third party.

Data extraction and management

Data was extracted independently by two authors using a standard data extraction form developed by the Airways Group. Trialists were contacted for further information and unpublished data if necessary. The data was entered into RevMan by one author and checked for accuracy by another. Again, any disagreement between the authors was resolved by discussion or consultation with a third party. In some cases data had to be estimated from graphs presented in the paper (Hsieh 1996; Lau 2004). In these cases the values were estimated by two reviewers and where there were differences the mid-point between the two was used.

Assessment of methodological quality of included studies

Two review authors independently assessed included studies for quality using two methods:

1) The Cochrane approach to assessing concealment allocation.

The method of allocation concealment in each trial was scored using the following grading system:
Grade A: Adequate concealment
Grade B: Uncertain concealment
Grade C: Inadequate concealment
Grade D: allocation concealment not used

2)The Jadad domains (Jadad 1996)

Each trial was assessed on the following criteria:
1) Was the study described as randomised?
2) Was the study described as double-blind?
3) Was there a description of withdrawal and dropouts?
4) Was the method of randomisation well described and appropriate?
5) Was the method of double blinding well described and appropriate?

Measures of treatment effect

Dichotomous data

The relative risk (RR) was calculated with 95% confidence intervals (CI).

Continuous data

A fixed-effect mean difference (MD) with 95% CI was calculated for outcomes reported in the same scale, and the standardised mean difference (SMD) with 95% CI was calculated for outcomes reported in difference scales.

Cross-over trials

Data from the first arm of cross-over trials was extracted and analysed with parallel-group trials. If these data were not available, cross-over trials were analysed using generic inverse variance (GIV).

Missing data

Data analysed in clinical trials should reflect the intention to treat (ITT) population. If such an analysis was not done, or was not forthcoming, we planned a sensitivity analysis to remove studies from the pooled analysis to determine the impact of potentially biased effect estimates on the overall result. Missing statistics such as standard deviations were sought from the study authors, where

they could not be calculated.

Data synthesis

Separate analyses were conducted for each type of herbal preparation, as a sole agent or in addition to usual treatment, versus placebo, no intervention or usual treatment. Where there was sufficient data a meta-analysis was carried out using RevMan 4.2.

Subgroup analysis and investigation of heterogeneity

Dependent on there being sufficient data, planned *a priori* subgroup analyses were:

- Adults or children only

Asthma severity (mild/moderate/severe, as determined by the requirement for treatment at baseline (BTS/SIGN 2005)

- study duration (short term: 1 month or less; medium term: 1-5 months and long term: 5 months or more)
- dosage
- Method of administration (e.g. tea, tablet etc)

It was planned to use the chi-squared test to detect heterogeneity across studies. To quantify the amount of variability present due to heterogeneity rather than chance, I^2 would have been calculated (Higgins 2005). If appropriate, any heterogeneity was to be explored by sub-group analysis, or incorporated by applying random-effects modelling.

Assessment of reporting bias

Funnel plots were to be used to test for publication bias if appropriate.

Sensitivity analysis

A sensitivity analysis was planned if sufficient studies of an intervention were identified, to examine the effect of trial quality and any quasi-randomised trials (such as alternative allocation or participants allocated on the toss of a coin), as opposed to true-randomised trials (where the randomisation process has been adequately concealed from the study investigators and participants).

RESULTS

Description of studies

See: Characteristics of included studies; Characteristics of excluded studies; Characteristics of ongoing studies.

Results of the search

The electronic searches retrieved a total of 2645 references. Additional hand searching by TW identified 111 studies conducted in the People's Republic of China. Correspondence with Asthma UK revealed one further study. After initial screening of the titles and abstracts, and collation of information from TW we assessed 252 studies for possible inclusion in the review. A total of 27 studies (represented by 29 experimental comparisons) met review entry criteria, randomising 1925 participants.

Included studies

Study Design

One study used a quasi randomised design (Hsieh 1996). The remainder were randomised placebo controlled designs using either parallel groups (Badria 2004; Chan 2006; Gabrielian 2004; Gupta 1979; Gupta 1998; Hederos 1996; Hsu 2005; Juergens 2003; Khayyal 2003; Lau 2004; Mathew 1974; Murali 2006; Rouhi 2006; Tamaoki 1995; Ziboh 2004) or a crossover design (Ebden 1989; Guinot 1987; Hosseini 2001; Lee 2004; Mansfeld 1998; Shivpuri 1969; Shivpuri 1972; Thiruvengadam 1978; Thomas 2006; Urata 2002). All were double blinded except one single blinded study where the colours of study and placebo medicine sachets differed (Khayyal 2003). In one study the allocation method was not stated (Sekhar 2003). Clarification was sought from the author but we have received no response to date. The study has been included as there is a placebo control, but we cannot be sure whether it is a randomised or quasi-randomised study.

Participants

The smallest sample size were eight (Guinot 1987) and 12 (Ebden 1989). Others ranged from 15 to 30 (Gabrielian 2004; Hosseini 2001; Lee 2004; Mansfeld 1998; Tamaoki 1995; Thiruvengadam 1978), 31 to 99 (Badria 2004; Chan 2006; Hederos 1996; Gupta 1998; Juergens 2003; Khayyal 2003; Lau 2004; Rouhi 2006; Sekhar 2003; Thomas 2006; Urata 2002; Ziboh 2004) or 100 to 200 (Gupta 1979; Hsu 2005; Mathew 1974; Shivpuri 1969; Shivpuri 1972). The largest was 334 (Hsieh 1996).

Six studies included children (Chan 2006; Hederos 1996; Hsieh 1996; Hsu 2005; Lau 2004; Mansfeld 1998) and 14 included adults (Badria 2004; Ebden 1989; Gabrielian 2004; Guinot 1987; Gupta 1998; Hosseini 2001; Juergens 2003; Khayyal 2003; Lee 2004; Shivpuri 1969; Tamaoki 1995; Thomas 2006; Urata 2002; Ziboh 2004). One recruited a mixed age group ranging from 14-20 yrs (Gupta 1979) and age was not stated in four others (Mathew 1974; Sekhar 2003; Shivpuri 1972; Thiruvengadam 1978). One study reported as having been done in children aged 5-18 years (Hsu 2005), actually reported an age range to 55; clarification was sought from the author but none was received. One study did not give sufficient details of baseline characteristics (Rouhi 2006).

Inclusion criteria required demonstration of reversibility in five studies (Badria 2004; Hsu 2005; Lee 2004; Mansfeld 1998; Thiruvengadam 1978), meeting existing diagnostic criteria for asthma in 11 studies (Badria 2004; Chan 2006; Hederos 1996; Hosseini 2001; Hsieh 1996; Juergens 2003; Khayyal 2003; Lau 2004; Rouhi 2006; Urata 2002; Ziboh 2004) or a clinical diagnosis or history of asthma in ten(Ebden 1989; Gabrielian 2004; Guinot 1987; Gupta 1979; Gupta 1998; Mathew 1974; Sekhar 2003; Shivpuri 1969; Shivpuri 1972; Tamaoki 1995). Inclusion criteria were not stated in one study (Thomas 2006).

Settings

Subjects were recruited as in-patients in two studies(Gupta 1998; Khayyal 2003), out-patients in ten (Badria 2004; Chan 2006; Gabrielian 2004; Gupta 1979; Hosseini 2001; Hsieh 1996;

Juergens 2003; Lau 2004; Lee 2004; Mansfeld 1998), or from both sources in 3 studies (Sekhar 2003; Shivpuri 1969; Shivpuri 1972). Recruitment was via a hospital notice board in one study (Murali 2006) and the recruitment setting was not stated for 11 studies (Ebden 1989; Guinot 1987; Hederos 1996; Hsu 2005; Mathew 1974; Rouhi 2006; Tamaoki 1995; Thiruvengadam 1978; Thomas 2006; Urata 2002; Ziboh 2004).

Interventions

A total of 21 different study drugs were compared with placebo.

Chinese Traditional Medicines (TCM)

1.Mai-Men-Dong-Tang (Hsu 2005)
2.Liu-Wei-Di-Huang-Wan (Hsieh 1996)
3.Shen-Ling-Bia-Shu-San (Hsieh 1996)
4.Jai-Wei-Si-Jun-Zi-Tang (Hsieh 1996)
5.Ding Chuan Tang (Chan 2006)

Indian

1.Tylophora indica (Gupta 1979; Mathew 1974; Shivpuri 1969; Shivpuri 1972; Thiruvengadam 1978)
2.Devadaru compound (Sekhar 2003)
3.Pulmoflex (Gabrielian 2004)
4.Herbal compound DCBT4567-Astha-15 (Murali 2006)

Japanese

1.TJ-96 "saiboku-to" (Urata 2002)

Other

1.Ivy leaf extract (Mansfeld 1998)
2.Gammalinolenic acid-containing Borage oil (Ziboh 2004)
3.Ginkgolides (Guinot 1987) or Ginkgo containing (Thomas 2006)
4.1.8-cineol (eucalyptol) (Juergens 2003)
5.Butterbur (Lee 2004)
6.Menthol vapour (Tamaoki 1995)
7.Pycnogenol (French maritime pine bark extract) (Hosseini 2001; Lau 2004)
8.Boswellic acids (Badria 2004; Gupta 1998)
9.Evening primrose oil (Ebden 1989; Hederos 1996)
10.Propolis extract (Khayyal 2003)
11.Ginger (Rouhi 2006)

The mean duration of treatment was 8.4 weeks. Treatment periods ranged from three to seven days for eight studies (Guinot 1987; Gupta 1979; Lee 2004; Mansfeld 1998; Mathew 1974; Shivpuri 1969; Shivpuri 1972; Thiruvengadam 1978), two to 16 weeks for 17 (Badria 2004; Chan 2006; Ebden 1989; Gabrielian 2004; Gupta 1998; Hederos 1996; Hosseini 2001; Juergens 2003; Khayyal 2003; Lau 2004; Murali 2006; Rouhi 2006; Sekhar 2003; Tamaoki 1995; Thomas 2006; Urata 2002) and four to 12 months for three (Hsieh 1996; Hsu 2005; Ziboh 2004).

Outcome measures

Primary and secondary outcome measures were reported in the following studies:

1. FEV1/FVC (Badria 2004; Chan 2006; Guinot 1987; Gupta 1979; Hosseini 2001; Hsu 2005; Juergens 2003; Khayyal 2003; Lee 2004; Rouhi 2006; Sekhar 2003; Tamaoki 1995; Thomas 2006; Urata 2002; Ziboh 2004) or changes from baseline (Gupta 1998; Mansfeld 1998; Murali 2006; Thiruvengadam 1978)
2. PEFR (Badria 2004; Chan 2006; Ebden 1989; Gupta 1979; Gupta 1998; Hsu 2005; Juergens 2003; Khayyal 2003; Thomas 2006) or changes in PEFR (Gupta 1998; Hsieh 1996; Lau 2004; Tamaoki 1995; Thiruvengadam 1978)
3. VC (Mansfeld 1998; Tamaoki 1995; Thiruvengadam 1978)
4. FEF25-75 (Khayyal 2003; Lee 2004)
5. Maximum Breathing Capacity (MBC) (Thiruvengadam 1978)
6. Exacerbation rates (Badria 2004; Gupta 1998; Khayyal 2003; Thomas 2006)
7. Changes in medication use (Chan 2006; Ebden 1989; Juergens 2003; Lau 2004; Shivpuri 1972; Tamaoki 1995)
8. Symptoms scores (Gupta 1979; Hosseini 2001; Hsieh 1996; Hsu 2005; Juergens 2003; Lau 2004; Mathew 1974; Murali 2006; Shivpuri 1969; Shivpuri 1972; Tamaoki 1995; Thiruvengadam 1978; Thomas 2006; Urata 2002)
9. Subjective assessments (Gabrielian 2004; Gupta 1998; Hsieh 1996; Lau 2004; Rouhi 2006)

Evidence of harms

Saiboku-to has been associated with cases of pneumonia and pneumonitis (Bielory 1999)

Pulmoflex- stated that no adverse reactions were reported during study (Gabrielian 2004)

Evening primrose oil - did not report on adverse events (Ebden 1989; Hederos 1996)

Ginkgolides - stated no side effects were reported during two studies (Guinot 1987; Thomas 2006)

Tylophora- Giddiness nausea vomiting and abdominal pain (Gupta 1979; Mathew 1974; Shivpuri 1969; Shivpuri 1972) and sore mouth (Mathew 1974; Shivpuri 1969; Shivpuri 1972), nausea is a known problem with this preparation so Ipecacuanha was used as placebo in one study (Gupta 1979). Rates were much higher in study than placebo group in two studies (Shivpuri 1969; Shivpuri 1972). There was no reference to side effects in the most recent study (Thiruvengadam 1978).

Boswellic acids - two patients in one study reported nausea abdominal pain and hyperacidity (Gupta 1998)

Pycngenol - 1 episode of gastrointestinal disturbance (Hosseini 2001) but no adverse effects reported in the study of children (Lau 2004)

Traditional Chinese Medicine - 3 subjects reported abdominal pain in one study (Hsieh 1996) but another reported no adverse events (Hsu 2005)

Eucalyptol - heartburn and gastritis (Juergens 2003)

Propolis - side effects were not commented on (Khayyal 2003)

Butterbur - there was no reporting of any side effects (Lee 2004)

Ivy leaf extract - there was no reporting of adverse events (Mansfeld 1998)

Menthol vapour - 2 dropouts due to upper airway discomfort (Tamaoki 1995)

Borage oil - side effects were not discussed (Ziboh 2004)
Ginger - no side effects were discussed (Rouhi 2006)
DCT - described as well-tolerated (Chan 2006)

Excluded studies
A total of 225 studies were excluded after examining the full-text paper for the following reasons:
No placebo control (160)
Not described as randomised or quasi randomised (17)
Not a trial of stable asthmatics (17)
Not a trial (8)
Not reporting a primary outcome (8)
Duplicate publication (5)
Before and after or case control study (5)
Intervention is not herbal (3)
Intervention is smoking (1)
Not a human trial (1)
Please see 'Characteristics of Excluded Studies' for further details.

Ongoing studies/studies awaiting assessment
Two ongoing studies were identified (Luciuk 2003; NCCAM). We hope to be able to assess these for inclusion when this review is updated. There are currently eight studies awaiting assessment. These are listed in Table 3.

Risk of bias in included studies

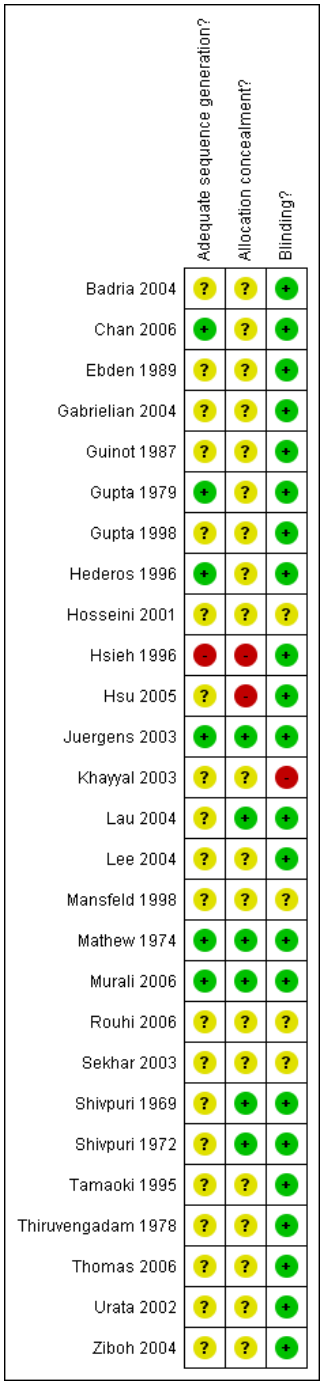
The reporting quality of the studies was poor. Based on study publications, we could only assess methodological quality for a small number of the included trials. Although all of the studies were reported as being randomised and blinded, the detail of these characteristics was frequently not elaborated.

Randomisation
This was adequately described (in seven trials (26%), and was inadequate in one of them (Hsieh 1996). In the remaining four studies where randomisation was described, the process was undertaken by a third party and was generated automatically.

Blinding
Identical presentation of treatment and control treatments was described in 10 studies (37%). In one study an emetic agent was added to the placebo preparation in order to mask this particular side-effect (Gupta 1979).

Withdrawal
Eight studies reported withdrawals (30%: Chan 2006; Hederos 1996; Hsieh 1996; Hsu 2005; Khayyal 2003; Lee 2004; Mansfeld 1998; Tamaoki 1995).
Only one study gave adequate descriptions of all three of these domains (Hsu 2005). Gupta 1979; Juergens 2003; Mathew 1974 gave descriptions of randomisation and blinding. Tamaoki 1995 reported blinding and withdrawals adequately.
An overview of our judgments of randomisation and blinding are presented in Figure 1.

Figure 1. Methodological quality summary: review authors' judgments about each methodological quality item for each included study.



Effects of interventions

Twenty seven studies (29 experimental groups) contributed data to the analysis. One study of Evening Primrose Oil did not contribute any numerical data as separate data were not available for the asthma sub-group (Hederos 1996). However this paper reported no significant difference for the asthma sub-group and this was confirmed by correspondence with the author.

Studies tended to report individually defined measures of changes in lung function, thus combination of data for meta-analysis was only possible within subgroups of two studies; Boswelia (Badria 2004) and Mai-Men-Don Tang (Hsu 2005), and between studies of tylopohora indica (Gupta 1979; Mathew 1974; Shivpuri 1969; Shivpuri 1972).

Primary outcomes

Lung function

The following measures are presented: Forced Expiratory Volume in 1 second (FEV1); Peak Expiratory Flow Rate (PEFR); Forced Vital Capacity (FVC); Vital Capacity (VC); Forced Midexpiratory Flow Rate (FEF25-75); and Mean Breathing Capacity (MBC).

FEV1

Mean final FEV1 as % predicted

There was a significant difference in favour of Boswellia: 7.24% difference (95% confidence interval 1.46 to 13.02), three subgroups analysed from Badria 2004 (42 participants).

There was a significant difference in favour of one herbal treatment from an individual clinical trial:

Propolis: 16.5 % (95% confidence interval 6.7 to 26.3), Khayyal 2003 (46 participants).

There were no significant differences in this outcome in seven other individual studies assessing nebulised menthol (Tamaoki 1995); 1.8-cineol (eucalyptol) (Juergens 2003); Pcynogenol (extract of French maritime bark) (Hosseini 2001); BN 52063 (Ginkgolides A, B & C) (Guinot 1987); DCT (Chan 2006), Mai-Men-Dong-Tang (Hsu 2005), and Tj-96 ("Saiboku-to") (Urata 2002)

Change from baseline FEV1 (%)

There was no significant difference for ivy leaf extract (Mansfeld 1998)

Change from baseline in FEV1(Litres)

There were significant differences in favour of the following herbal treatment from an individual clinical trial:

Boswellia: 0.4L (95% confidence interval 0.23 to 0.57), Gupta 1998 (80 participants).

FEV1 (Litres) at end of treatment

There were no significant differences for eight studies assessing 1.8-cineol (eucalyptol) (Juergens 2003); tylophora indica (Gupta 1979); BN 52063 (Ginkgolides A, B & C) (Guinot 1987); butterbur (Lee 2004); ivy leaf extract (Mansfeld 1998); AKL1 (containing Ginkgo biloba plus other unreported ingredients) (Thomas 2006); Indian herbal compound Murali 2006 and Tj-96 ("Saiboku-to") (Urata 2002).

Ziboh 2004 measured this outcome but no SDs were reported so it was not possible to calculate an effect size for Borage oil.

FEV1 (Litres) at two week follow-up

There was no significant difference for Tylophora indica (Gupta 1979).

Number of patients showing >15% increase in FEV1 at end of treatment

There was no significant difference for Tylophora indica (Mathew 1974; Gupta 1998).

Number of patients showing >15% increase in FEV1 at two week follow up

There was no significant difference for Tylophora indica (Gupta 1998).

Number of patients showing >15% increase in FEV1 at 12 week follow up

There was no significant difference for Tylophora indica (Mathew 1974)

Number of patients showing at least 5% increase in FEV1 end of treatment

There was a significant difference in favour of Mai-Men-Dong-Tang: RR=8.00 (95% confidence interval 2.02 to 31.71), Hsu 2005 (100 participants).

PEFR

Final PEFR as % predicted

There was a significant difference in favour of the two herbal treatments from individual clinical trials:

Propolis: 13% difference (95% confidence interval 4.68 to 21.32), Khayyal 2003 (46 participants).

Pycnogenol: 17.85% difference (95% confidence interval 12.9 to 22.8), Lau 2004 (60 participants).

Change in PEFR as % predicted

There was no significant difference for nebulized menthol (Tamaoki 1995)

PEFR (Litres/min)

There was no significant difference for four individual studies assessing 1.8-cineol (eucalyptol) (Juergens 2003); Tylophora indica (either at end of treatment or follow-up) (Gupta 1979); Butterbur (Lee 2004); or AKL1 (Gingko biloba plus other ingredients) (Thomas 2006)

Change in absolute PEFR (Litres/min)

There was a significant difference in favour of Boswellia extract: 44.5 L/min (95% confidence interval 24.24 to 64.76), Gupta 1998 (80 participants).

Thiruvengadam 1978 also measured this outcome but no SDs were reported so it has not been possible to calculate an effect size for Tylophora indica.

Mean PEFR (Standardised Mean Difference (SMD))
There was no significant difference for Boswellia extracts (Badria 2004; Gupta 1998)
Mean morning PEF (Litres/min)
There was no significant difference for Evening Primrose Oil (Ebden 1989).
Change in early morning PEFR (Litres/min)
There was no significant difference for either Liu-Wei-Di-Huang-Wan, Shen-Ling-Bai-Shu-San or Jia-Wei-Si-Jun-Zi-Tang (Hsieh 1996).
Change in evening PEFR (Litres/min)
There was no significant difference for Liu-Wei-Di-Huang-Wan, Shen-Ling-Bai-Shu-San or Jia-Wei-Si-Jun-Zi-Tang (Hsieh 1996).
Number of patients showing >20% increase in PEFR at end of treatment
There was a significant difference from two studies in favour of Tylophora indica: RR=1.39 (95% confidence interval 1.08 to 1.78), Mathew 1974; Gupta 1979 (249 participants).
Number of patients showing >20% increase in PEFR at two week follow-up
There was no significant difference for Tylophora indica (Gupta 1979).
Number of patients showing >20% increase in PEFR at 12 week follow-up
There was a significant difference for Tylophora indica: RR=2.37 (95% confidence interval 1.05 to 5.31), Mathew 1974 (114 participants).

FVC

FVC as % predicted
There was no significant difference for four studies of Boswellia extracts (Badria 2004); DCT (Chan 2006), Propolis (Khayyal 2003) or Tj-96 ("Saiboku-to") (Urata 2002).

Mean increase in FVC (Litres)
There was a significant difference in favour of Boswellia extracts: 0.4L (95% confidence interval 0.20 to 0.60), Gupta 1998 (80 participants).

FVC (Litres)
There was no significant difference for Tj-96 (Urata 2002).
Mansfeld 1998 measured this outcome but no SDs were reported so it has not been possible to calculate an effect size for Ivy leaf extract.
FVC as % change from baseline
Mansfeld 1998 measured this outcome but no SDs were reported so it has not been possible to calculate an effect size for Ivy leaf extract.

VC

VC as % predicted
There was no significant difference for nebulized menthol (Tamaoki 1995)
VC (Litres) & VC % change from baseline
Mansfeld 1998 measured both these outcomes but no SDs were reported so it has not been possible to calculate an effect size for Ivy leaf extract.
Mean daily change in VC (Litres)
Thiruvengadam 1978 measured this outcome but no SDs were reported so it has not been possible to calculate an effect size for Tylophora indica.

Other measures of lung function

FEV1/FVC ratio
There was no significant difference for Pycnogenol (Hosseini 2001)
FEF25-75 as change in % predicted
There was a significant difference in favour of Propolis: 13.5% (95% confidence interval 1.13 to 25.87), Khayyal 2003 (46 participants).
There was no significant difference for Butterbur (Lee 2004).
MBC mean daily change (Litres/min)
Thiruvengadam 1978 measured this outcome but no SDs were reported so it has not been possible to calculate an effect size for Tylophora indica.

Reduction in use of corticosteroids

Oral steroid reduction (mg)
There was a significant reduction in favour of 1.8-cineol (eucalyptol): 2.84 mg (95% confidence interval 1.00 to 4.68), Juergens 2003 (32 participants).
Patients tolerating a 2.5 mg reduction in steroids
There was no significant difference for 1.8-cineol (eucalyptol) (Juergens 2003)

Patients tolerating a 5 mg reduction in steroids
There was a significant difference in favour of 1.8-cineol (eucalyptol): RR=3.00 (95% confidence interval 1.23 to 7.34), Juergens 2003 (32 participants).
Patients tolerating a 7.5 mg reduction in steroids
There was no significant difference for 1.8-cineol (eucalyptol) *(* Juergens 2003*)*

Patients tolerating a 10 mg reduction in steroids
1.8-cineol (eucalyptol) *(*Juergens 2003*)*
Inhaled steroid reduction
There was no significant difference for DCT (Chan 2006) in the number of participants able to reduce ICS dose in each group.

Secondary outcomes

Symptoms and symptom scores

For 1.8-cineol (eucalyptol) there were significant reductions (i.e. improvements) in dyspnoea score (WMD -1.5; 95% confidence interval -0.58 to -2.42), patients' global assessment of efficacy (WMD -0.70; 95% confidence interval -0.02 to - 1.38), and physicians' global assessment of efficacy (WMD -1.50; 95% confidence interval -0.82 to -2.18) (Juergens 2003, 32 participants). For Pul-

moflex there was a significant reduction in the patients experiencing deterioration: RR 0.21 (95% confidence interval 0.05 to 0.97) (Gabrielian 2004). Mai-Men-Dong-Tang and Indian herbal compound showed no significant change in symptoms scores (Hsu 2005; Murali 2006).

Number of nocturnal attacks were significantly reduced compared to placebo with propolis (WMD -1.39; 95% confidence interval -0.80 to -1.98) Khayyal 2003.

There were significant improvements in symptoms scores for tylophora indica compared with placebo: Symptom score improved >50%after 1 week: RR 2.02 (95%CI 1.36 to 3.00) (Mathew 1974; Gupta 1979) 258 participants, after 12 weeks RR 2.17 (95% confidence interval 1.00 to 4.69) Mathew 1974 123 participants, but this was not sustained 2 weeks after treatment RR 1.13 (95% confidence interval 0.82 to 1.58) (Gupta 1979 135 participants). The change of symptom scores was not significant at the end of one study: WMD -0.59 (95% confidence interval -5.42 to 4.24), or 2 weeks later: WMD -0.66 (95% confidence interval -7.09 to 5.77) Gupta 1979 125 subjects.

Symptom score reductions favoured treatment with pycnogenol in children: SMD -3.84 (95% confidence interval -2.97 to -4.72) (Lau 2004 60 participants), but not adults (symptom score 1-4: change -0.41 95% confidence interval -0.84 to 0.02) Hosseini 2001 (22 participants). No significant difference was observed between Saiboku-to and placebo (Urata 2002).

One study of 15AKL (Ginkgo biloba and other unreported ingredients) showed no significant change in the Asthma Control Questionnaire (-0.35; 95% confidence interval -0.78 to 0.08) or the Leicester Cough Questionnaire (0.49; 95% confidence interval -0.18 to 1.16) but did report a greater number of improved scores for the Asthma Control Questionnaire in the treatment group (RR 2.29; 95% confidence interval 1.09 to 4.79) Thomas 2006 (32 participants).

Hsieh 1996 reported subjective improvements in a sample of 66 participants in favour of the Traditional Chinese Medicines Liu-Wei-Di-Huang-Wan, Shen-Ling-Bai-Shu-San or Jia-Wei-Si-Jun-Zi-Tang as assessed by allergists: (Liu-Wei-Di-Huang-Wan RR 1.69; 95%confidence interval 1.17 to 2.24, Shen-Ling-Bai-Shu-San RR 1.86; 95% confidence interval 1.35 to 2.57 and Jia-Wei-Si-Jun-Zi-Tang RR 1.73; 95% confidence interval 1.17 to 2.57), by Chinese doctors (Liu-Wei-Di-Huang-Wan RR 1.69; 95% confidence interval 1.17 to 2.24, Shen-Ling-Bai-Shu-San RR 1.62; 95% confidence interval 1.24 to 2.12 and Jia-Wei-Si-Jun-Zi-Tang RR 1.82; 95% confidence interval 1.24 to 2.68), and by parents (Liu-Wei-Di-Huang-Wan RR 1.62; 95%confidence interval 1.18 to 2.23, Shen-Ling-Bai-Shu-San RR 1.68; 95% confidence interval 1.29 to 2.18 and Jia-Wei-Si-Jun-Zi-Tang RR 1.60; 95% confidence interval 1.16 to 2.21). There were also objective improvements in symptom scores for Liu-Wei-Di-Huang-Wan WMD -0.40; 95%confidence interval -0.66 to -0.14, and for Shen-Ling-Bai-Shu-San WMD -0.31; 95% confidence interval -0.58 to -0.04 and no significant difference for Jia-Wei-Si-Jun-Zi-Tang WMD 0.19; 95% confidence interval -0.06 to 0.44).

The study of Ginger (Rouhi 2006), reported significant subjective improvements in the number of patients experiencing dyspnea (RR 0.84 (95% confidence intervals 0.72 to 0.98)), wheeze (RR 0.78 (95% confidence intervals 0.67 to 0.91)) and chest tightness (RR 0.29 (95% confidence intervals 0.18 to 0.48)).

Physical sign scores

There were higher rates of >50% improvements in symptoms scores for tylophora indica compared with placebo after 1 week RR 1.87 (95% confidence interval 1.18 to 2.96)(Mathew 1974 123 participants) and 12 weeks RR 2.58 (95% confidence interval 1.22 to 5.43) (Mathew 1974 123 participants). Similarly pooled results from 3 studies showed a rate for total clinical improvement >50% was higher after 1 week RR 2.06 (95% confidence interval 1.62 to 2.62) (Shivpuri 1969; Shivpuri 1972; Mathew 1974 428 participants) but was no longer significant after 12 weeks RR 1.53 (95% confidence interval 0.94 to 2.48) (Shivpuri 1969; Shivpuri 1972; Mathew 1974 381 participants).

Use of reliever medications

There was a significant reduction in the use of reliever inhalers with menthol vapour (Tamaoki 1995) WMD -2.30 (95% confidence interval -3.13 to -1.47). There was no significant reduction in use of reliever inhaler with 1.8-cineol (eucalyptol) (Juergens 2003), DCT (Chan 2006), or evening primrose oil compared to placebo (Ebden 1989). However use of albuterol was significantly reduced for children taking Pycnogenol: -2.1 puffs/24 hours (95% confidence interval -1.67 to 0 -2.53) (Lau 2004 60 participants).

Scores for drug consumption with tylophora indica were significantly reduced after 1 week RR 2.60 (95% confidence interval 1.60 to 4.24) (Mathew 1974 123 participants) and 12 weeks RR 2.29 (95% confidence interval 1.13 to 4.66) (Mathew 1974 123 participants).

For one study of three Traditional Chinese Medicines there were no significant changes in medication scores (Liu-Wei-Di-Huang-Wan WMD -0.38; 95%confidence interval -1.32 to 0.56, Shen-Ling-Bai-Shu-San WMD -0.59; 95% confidence interval -1.58 to 0.40 and Jia-Wei-Si-Jun-Zi-Tang WMD 0.50; 95% confidence interval -0.95 to 1.95) (Hsieh 1996 66 participants).

Health related quality of life (QoL)

One study of 15AKL (Ginkgo biloba and other unreported ingredients) showed no significant change in the Asthma Quality of Life Questionnaire (0.42; 95% confidence interval -0.09 to 0.93) (Thomas 2006 32 participants).

Changes in rates of consultation

No study reported this outcome

Adverse effects

Meta analysis of three studies of Tylophora indica showed that significantly more study than control subjects reported side effects after 1 week RR 4.03 (95% confidence interval 2.33 to 6.95) (Shivpuri 1969; Shivpuri 1972; Mathew 1974 428 participants). Specifically subjects reported loss of salt taste, sore mouth, nausea and vomiting. A fourth study of tylophora not included in the meta

analysis also reported these side effects (Gupta 1979) but adverse effects were not mentioned in one other study (Thiruvengadam 1978). Gastro intestinal side effects were also reported in one study of Boswelia (nausea epigastric pain and hyperacidity; Gupta 1998), but not the other (Badria 2004), and for 1.8-cineol (eucalyptol) (heartburn and gastritis; Juergens 2003), Traditional Chinese Medicine (abdominal pain and unpleasant taste; Hsieh 1996), and pycnogenol (gastrointestinal disturbance; Hosseini 2001), although in his study of pycnogenol in children Lau reports no side effects were observed (Lau 2004). Murali 2006 reported no significant difference between a compound herbal preparation and placebo in terns of nausea and headache.

There were 2 withdrawals in the study of menthol vapour due to upper airway discomfort (Tamaoki 1995).

Studies of AKL1 (Thomas 2006), BN52063 (Guinot 1987), Pulmoflex (Gabrielian 2004) and evening primrose oil (Ebden 1989) state that no side effects were noted. The remaining studies did not report adverse events (Urata 2002; Hsu 2005; Sekhar 2003; Mansfeld 1998; Ziboh 2004; Lee 2004; Khayyal 2003).

Withdrawal or drop-out rates

Data were only analysed for 32 of 33 subjects in the study of TJ-96, but no withdrawals were described (Urata 2002). Four of 28 subjects dropped out of the study of ivy leaf extract (Mansfeld 1998). in studies of pycnogenol, 22 of 26 adults completed the first arm, 1 dropped out due to pregnancy, 2 with non compliance and 1 is not described. A further 3 dropped out in the placebo period but data is presented for 22 patients (Hosseini 2001). In the study of children there were no drop-outs and compliance rates for all study medicines and placebo were 93% and 87% respectively (Lau 2004). In one study of Tylophora 22 of 103 subjects on Tylophora and 8 of 92 on placebo dropped out after 8 weeks (Shivpuri 1972), but there were no drop outs described in four other studies (Shivpuri 1969; Thiruvengadam 1978; Mathew 1974; Gupta 1979). In the six month study of TCM 303 of 334 children completed the study, drop outs being attributed to intercurrent illness, lack of efficacy or moving away (Hsieh 1996). in the Mai-Men-Dong-Tang study drop out rates for the two study and placebo groups were 7 of 40, 11 of 40 and 3 of 20 respectively; no description is given (Hsu 2005). There were 2 drop outs from 60 children in one study of evening primrose oil (Hederos 1996) but none in the other (Ebden 1989). Three children from each treatment group in Chan 2006 withdrew. The only withdrawals to occur in Murali 2006 were from the placebo group (5).

There were no withdrawals or drop-outs in studies of PAF-acather (Guinot 1987), Boswelia (Gupta 1998; Badria 2004), Pulmoflex (Gabrielian 2004), butterbur (Lee 2004), borage oil (Ziboh 2004), 1.8-cineol (eucalyptol)(Juergens 2003) or AKL1 (Thomas 2006). One placebo subject dropped out of the study of propolis (Khayyal 2003).

Withdrawals or drop-outs were not described for the study of Devadaru compound (Sekhar 2003).

DISCUSSION

Herbal preparations are used frequently in the management of asthma globally. We found 27 studies assessing 21 herbal preparations which met the entry criteria of the review. There were very little combined outcome data to assess, which reflects both the array of different interventions assessed, study designs and outcomes measured, for example FEV1 was reported in five different ways across 17 studies, of which five studies reported positive differences in favour of treatment and twelve were not significant. Consequently none of our planned a priori subgroup analyses were possible. The positive outcome data for many of the outcomes reported should be seen in the context of the poor reporting quality of the studies, which prevents a thorough evaluation of the evidence in this area. On the strength of current evidence there are only a limited number of preparations which have been assessed in such a way as to permit a substantial summary of their efficacy and safety.

Badria 2004 reported significant improvements in FEV1 as percentage of predicted for Boswellia in adults. The small sample subgroups drawn from the study may bias the pooled effect. The benefits measured as improvement in percentage of predicted FEV1 translate into only modest changes in actual FEV1 whose clinical relevance is therefore uncertain. Such benefits need to be carefully balanced against the unknown side-effect profile of this treatments; although the study did not report any adverse outcomes. Significant improvements in PEFR as percentage of predicted were reported for two other compounds: Propolis in adults (Khayyal 2003) and pycnogenol (French maritime pine bark extract) in children (Lau 2004). Again the changes in PEFR are expressed as change of percent predicted and translate into modest absolute changes of lung volumes. The only significant improvement in absolute PEFR, reported with Boswelia (Gupta 1998) is also small in clinical terms.

Meta-analysis of two studies of tylophora indica showed improvement in symptoms scores (>50%) after one week (Mathew 1974; Gupta 1979), and three studies showed impressive results in measuring clinical improvement at week one (defined as at least 50% reduction in frequency of attacks and only moderate symptoms), although this effect had disappeared by week 12 (Shivpuri 1969; Shivpuri 1972; Mathew 1974). Meta-analysis of physiological data from two studies showed a greater than 20% improvement in PEFR after one week (Mathew 1974; Gupta 1979) and in one study this improvement remained at 12 weeks follow up (Mathew 1974) This preparation was postulated to have an effect persisting for weeks after the six days of treatment administered in these studies, but no other objective measure of improvement was seen after 12 weeks. Whilst demonstrating improvement in attack frequency, this intervention may not be suitable for chronic application since it is also associated with severe gastrointestinal side-effects, sufficient to lead one of the trialists to include an emetic agent in the placebo comparator in order to mask treatment group

assignment (Mathew 1974).

Requirement for oral steroids is an indication that the nature of chronic asthma is severe and persistent (BTS/SIGN 2005). Where inhaled steroids are available, these are normally preferred to oral steroids if asthma can be satisfactorily controlled in this way (Adams 2005). One study assessed the effect of eucalyptol as an oral steroid sparing agent (Juergens 2003). The mean daily dose reduction of nearly 3 mg would translate to a meaningful reduction in the daily steroid load, especially since a significant decrease in symptoms favouring treatment accompanied this reduction. Nevertheless longer-term follow-up would be necessary to establish whether this effect is sustainable beyond 12 week duration of this study. Oral steroid dosages at entry ranged from 5 to 24 mg prednisolone daily, therefore this was a selected group of asthmatics at step 5 of current asthma guidelines. Further information on the effect of eucalyptol on inhaled steroid dosage and in a more representative sample of asthmatics is therefore needed.

There were some reported improvements in subjective asthma symptoms. Boswellia, eucalyptol, ginger, pulmoflex, propolis, tylophora indica, Tj-96, Liu-Wei-Di-Huang-Wan, Shen-Ling-Bia-Shu-San, and Jai-Wei-Si-Jun-Zi-Tang all produced some improvement in patient's symptoms. However, the way in which these symptoms were reported is vastly different, for example, Pulmoflex (Gabrielian 2004) showed improvement in 'patients experiencing deterioration' while Ginger (Rouhi 2006) showed improvement in 'patients experiencing chest tightness'. Values for Chinese herbs Liu-Wei-Di-Huang-Wan, Shen-Ling-Bia-Shu-San, and Jai-Wei-Si-Jun-Zi-Tang (Hsieh 1996) had to be estimated from graphs, and there were issues with the adequacy of blinding in these trials. The study of Propolis (Khayyal 2003) used different coloured sachets to administer the treatment and control and Rouhi 2006 did not mention any attempt to mask the strong taste of ginger. The inconsistencies and the poor quality of the reporting in these trials does undermine the validity of these results. Table 4 demonstrates the lack of information for many of the studies which prevented their contribution to the analysis of data in the this review.

It is commonly perceived that herbal treatments for asthma are safer than proprietary medications. However, their use has been associated with an increase in hospital admission (Blanc 1997). In this review 9 of the sixteen studies which considered adverse effects reported their presence. Symptoms were predominantly gastrointestinal and for some studies dropout rates were significant (Shivpuri 1972; Hsu 2005).

There are a number of limitations to the studies of traditional Chinese medicine (TCM) trials identified from the literature searches which did not meet the entry criteria of the review. Firstly, none of the trials used a placebo as control. Without this, participants were aware as to their treatment group allocation. Secondly, none of the trials undertook allocation concealment. Although Chinese medicinal herbs as a treatment for chronic asthma are widely accepted in China, most of the constituents of the pharmacologically prepared drugs used in trials were not clearly specified. This is in marked contrast to pharmacological agents used in Western medicine, in which the chemical constituents, their quantities and the percentage of any impurities or contaminants are more widely known, and variation between different production batches is kept within specified limits. Variation between formulations and batches of formulations are inevitable consequences of TCM, though the Chinese Government specifies acceptable limits of variation. This variation may be a contributory factor in differing study results. Therefore, when a trial uses a self-prepared herbal formulation, the quality of herbs and methods of preparation should be stated in detail, in order to assess properly whether inconsistent effects could be explained by differences in treatments. Lastly, a large number of the trials claimed to be RCTs, but when we contacted the trial authors about the method of randomisation they used, we found that more than 95% of the authors misunderstood the concept of randomisation. In addition to this, some of the studies were conducted several years ago, and the trial authors may have forgotten the details of the methodology they employed, which could lead to bias and affect the veracity of information.

Extrapolating the findings of the studies in this review to a more general population is hampered by the poor reporting quality of the original studies. Sixteen trials were reported after the publication of the CONSORT statement in 1996 (Consort), but only four of these (Chan 2006; Hsu 2005; Juergens 2003; Murali 2006) report both the method of randomisation and blinding. The quality of reporting in the studies leaves open to question whether the positive findings in the review could be used to inform a decision on whether to use any of the treatments studied. Gagnier 2006 presents an elaborated CONSORT statement for the reporting of RCTs in herbal interventions. Journals should take into account the recommendations for reporting the intervention, its delivery and adequate control.

The mean sample size was 69, and data from different studies were available for statistical combination in seven outcomes from a total of 119 outcomes contributing to the review. Priorities for research in this area include better reporting of methodology, more open disclosure of outcome data, and clear reporting of baseline characteristics. Only one study reported group mean FEV1 of predicted (Urata 2002) and more frequent reporting of standard absolute measures of lung function and severity indicators would facilitate more informed decision-making when people are considering the use of herbal preparations in the management of asthma.

AUTHORS' CONCLUSIONS

Implications for practice

On the basis of the evidence presented in this review, the authors

conclude that although some herbal preparations have shown improvement in subjective measures of asthma symptoms, this is not strongly supported by objective measures, and may be related to biases within the studies such as inadequate blinding.

Implications for research

Tylophora indica has been studied in five papers included in this review. There is some evidence for benefit but studies of longer than six days duration are needed. The significant evidence of adverse effects suggests that further work to differentiate the active ingredient(s) from the causes of the side effects will be required before longer studies can be performed. Some other preparations (boswellia, Mai-Men-Dong-Tang, Propolis, pycnogenol and Jia-Wei-Si-Jun-Zi-Tang) show some potential to improve lung function, or to reduce daily steroid dosage (eucalyptol), but the trials reporting these are of small sample size and short duration. There is a need for carefully constructed trials of adequate power to further assess these compounds. Future studies should conform to CONSORT guidance and report readily comparable measures such as absolute levels of spirometric data and use existing validated measures of symptom and disease severity.

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* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Badria 2004

Methods	Randomised, double-blind, placebo-controlled, withdrawals not described
Participants	42 (1 male, 41 female), mild subgroup (Group A) 7/7, moderate subgroup (Group B) 7/7, severe subgroup (Group C)7/7, age 18-59, mean 37.86, SD 9.41. Inclusion criteria: Outpatients at Mansoura University Hospital & Mansoura Chest Hospital, Egypt. Clinical history and physical examination showing bronchial asthma. Exclusion: smokers; recent exacerbation; hospitalized six weeks prior to study; use of systemic steroids in last six months; parasitic infections; respiratory infections; autoimmune diseases; diabetes; liver disease
Interventions	Boswellia carterii extract in capsule form, containing 1g of the extract (500mg of boswellic acid) . Two capsules given twice daily (2g) for 2 weeks. Control was lactose in a gelatin capsule given at the same dosage. All patients were on theophylline (6mg/k)
Outcomes	Mean no. asthma attacks/week; mean no. night asthma attacks/week; mean FVC; mean FEV1; mean PEF; mean blood eosinophilic counts; mean serum leukotriene levels
Notes	Country: Egypt. Mostly female study particpants

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Randomisation process not described
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	Yes	Identical presentation of treatments

Chan 2006

Methods	Randomised, double-blind, placebo-controlled parallel group trial
Participants	58 children aged 8-15. Diagnosed asthma according to GINA guidelines Inclusion criteria included symptom frequency percent predicted FEV1 of >60%, and an FEV1 variability < 30% Exclusion criteria percent predicted FEV1 of < 60%, and an FEV1 variability of >30%"
Interventions	12 weeks of 6 capsules of DCT (Din Chuan Tang) bd or placebo. DCT is a decoction of 9 herbs including gingko & Ephedra: Full ingredients are Ginkgo biloba, Ephedra sinica, Tussilago farfara,Morus alba, Pinellia ternata, Perilla frutescens, Prunus armeniaca, Scutellaria baricalensis, Glycyrrhizauralensis

Chan 2006 (*Continued*)

Outcomes	Asthma symptoms scores, use of bronchodilators, medication & additional treatment. Rescue free days. PEFR, methacholine challenge, FEV1, FVC, and bloods
Notes	Note all on inhaled fluticasone 250 - 500mcg daily for at least 3 months prior to study. CEC comment this is a high dose

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Yes	Treatment allocation code generated randomly.
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	Yes	Identical presentation of treatments

Ebden 1989

Methods	Randomised, double-blind, crossover trial. Two eight-week periods were studied
Participants	12 atopic mild, chronic asthma patients (4 male), mean age 33 (range 20-52)
Interventions	Two Efamol capsules (seed oil from Evening Primrose (Oenothera biennis)) 4 times daily. Each capsule contains 360mg linoleic acid and 45mg of gamma-linoeic acid; or 2 placebo capsules (500 mg liquid paraffin) 4 times daily for 8 weeks. Patients continued on normal medication except bronchodilators which they could use according to need and recorded daily useage
Outcomes	Peak flow, symptom scores (results not presented), bronchodilator use, (sGAW and fatty acids in blood: not extracted)
Notes	Country: UK. Crossover trial but results presented as parallel groups. No description of withdrawals

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Randomisation process not described
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	Yes	Placebo capsules were of 'similar' appearance

Gabrielian 2004

Methods	Randomized, double-blind, placebo controlled trial.
Participants	30 patients aged 25-65 years, males/females not reported. 22 patients with bronchial asthma, 8 with chronic asthmatic bronchitis, all with a mixture of atopic and infectious asthma. Some have secondary obstructive emphysema. 21 Patients in Group A (treatment), 9 in Group B (placebo). Inclusion criteria: adults over 25 with broncial asthma / chronic asthmatic bronchitis. Diagnosis confirmed by a pulmonologist. Exclusion criteria: Patients with accompanying heart disease, arterial hypertension or bronchiectasis. No information on drop-outs
Interventions	Treatment group received 2 capsules of 400 mg PulmoFlex (traditional Ayurvedic medicine containing standardised extracts of 11 herbs) per day for 3 weeks. Control group received 2 capsules of matching placebo per day for 3 weeks. Does not say what the placebo is. B2-agonists allowed
Outcomes	FEV1, vital capacity (VC), peak flow, frequency of asthma attacks, dyspnoea attacks, exercise tolerance
Notes	Country: Armenia. No adverse events reported.

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Method of randomisation not described.
Allocation concealment?	Unclear	Not described.
Blinding? All outcomes	Yes	Placebo capsule described as 'matching'.

Guinot 1987

Methods	Randomised, double-blind, placebo-controlled crossover
Participants	8 asthmatics (7 male) stable atopic asthmatics with FEV1>80% predicted & and positive skin prick test to house dust mite and no attacks in previous 2 months
Interventions	BN52063 (ginkgolides A, B & C) 40mg in capsules or placebo in crossover study for 2x3 days with 7 day washout between
Outcomes	Methacholine challenges measures bronchial hyperactivity were main outcome measures, but FEV1 reported for day 3 of Rx & placebo arms
Notes	Country: France (?). No side effects were mentioned.

Risk of bias

Item	Authors' judgement	Description

Guinot 1987 (*Continued*)

Adequate sequence generation?	Unclear	Method of randomisation not described.
Allocation concealment?	Unclear	Not described.
Blinding? All outcomes	Yes	Placebo described as 'matching'.

Gupta 1979

Methods	Randomized, double-blind placebo controlled trial.
Participants	135 asthmatics attending chest clinic, new Delhi, 3 subgroups of seasonal, perennial or irregular. 71 treated 64 placebo, male:female 2:25, age range 14-60
Interventions	Treatment group: powder of 200mg tylohophora leaves dried, 160mg dried powdered spinach leaves, 40mg glucose; placebo: spinach and glucose 340mg and ipecacuanha 60mg. Two packs of pwder daily for 6 days
Outcomes	FEV1, PEFR, symptom reduction, use of prescription meds reduction
Notes	Country: India

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Yes	Randomisation was by a 'randomisation table'.
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	Yes	Powders made up to look the same. Placebo contains Ipecacuanha (an emetic), as a side effect of Tylophora can be nausea & vomitting

Gupta 1998

Methods	Randomised, double-blind, placebo-controlled. No description of withdrawals (but imples that all patients finished the trial)
Participants	80 patients (39 males, 41 females); 40 patients in each group. Treatment: 23 males, 17 females aged 18-75. control: 16 males, 24 females aged 14-58. No statistical difference between demographics, but group taking treatment have more severe disease. Entry criteria: suffering from acute bronchial asthma presenting with breathlessness, wheezing, tachycardia, with or without cyanosis. Exclusion: tuberculosis, heart disease, lactose intolerance, all obstructive and restrictive lung diseases other than classical asthma

Gupta 1998 (*Continued*)

Interventions	Powdered gum resin of Boswellia serrata (S-Compound made by Rahul Pharma) 300mg Boswellic Acid. Placebo capsule containing lactose. Treatment group received 300mg orally 3 times a day for 6 weeks. Placebo group received 300mg lactose control 3 times a day for 6 weeks. Apart from initial treatment of the acute attack with salbutamol, no other drugs were taken during the study period
Outcomes	Change in FEV1, change in PEFR, number of asthma attacks during the treatment period. Secondry outcomes: respiratory rate, eosinophil count, dyspnoea relief, presence of rhonchi, change in FVC
Notes	Coutry: India. Two patients in treatment group complained of side-effects: nausea, stomach pain, acidity

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Method of randomisation not described.
Allocation concealment?	Unclear	Not described.
Blinding? All outcomes	Yes	Identical presentation of capsules.

Hederos 1996

Methods	Double-blind, randomised, placebo-controlled parallel group trial. Two withdrawals from treatment group: 1 did not like taste of capsules; 1 completed 8 weeks then refused any further assessments
Participants	60 children aged 1-16 yrs with atopic dermatitis. 22 patients also had asthma. 12 asthmatic patients in the treatment group (7 male, mean age 9.3), 10 in the placebo group (6 male, mean age 10.9)
Interventions	Epogram capsules containing 500mg evening primrose oil (40 mg GLA) with 10mg Vitamin E or placebo capsules containing 500 mg sunflower oil with 10mg vitamin E. Doseage was according to age. Children 1-12 years took 4 capsules twice daily. Children over 12 took 6 capsules twice daily. Usual treatment was allowed. Treatment period was 16 weeks
Outcomes	Asthma outcomes: Peak flow; clinicians graded assessment of the condition; number of days with extra asthma medication. However, the results for the asthma patients were not reported in the text so could not be extracted
Notes	Country: Sweden. Results for asthma sub-group not reported separately. The study found 'no clinical effect at all on peak expiratory flow or overall impression of asthma'. Author was contacted for the asthma sub-group results and responded that the data was not available

Risk of bias

Item	Authors' judgement	Description

Hederos 1996 (*Continued*)

Adequate sequence generation?	Yes	Randomisation by 'randomisation list'
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	Yes	Identical placebo capsules

Hosseini 2001

Methods	Randomized, double-blind, placebo controlled, crossover study
Participants	Enrolled 26 patients who had been referred to the allergy clinic in Mashad, 22 patients participated in the study. Asthmatic patients age 18-60 with baseline FEV1 30-75% predicted. 12 female, 10 male. Exclusion criteria: emphysema; bronchitis; renal, hepatic, cardiac or endocrine disease; pregnancy; patients on NSAIDs or vitamins; patients unwilling to exclude wine from their diet for the duration of the study
Interventions	Pycnogenol (1mg/lb/day to a maximum of 200mg/day) or placebo pills for four weeks, then patients were crossed over for a further four weeks. Usual medication was allowed apart from glucocorticoids & leukotriene antagonists
Outcomes	FEV1; FEV1/FVC ratio; cysteinyl-leukotriene values; asthma symptom scores
Notes	Country; Iran. Described as a pilot study. One adverse event (upset stomach during first 3-4 days of treatment). No washout period between treatment periods .

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Method of randomisation not described.
Allocation concealment?	Unclear	Not described.
Blinding? All outcomes	Unclear	Method of blinding not described

Hsieh 1996

Methods	Quasi-randomised, multi-centre, double-blind, placebo-controlled. There were 31 withdrawals: 13 from the treatment group and 18 from the placebo group
Participants	334 asthmatic children age 6-15, diagnosed by ATA criteria.with stable asthma, classified as: Group A - deficent in kidney energy, Group B spleen energy, and Group C both, selected from 1543 stable asthmatics, 2130 recruited initially

Hsieh 1996 (*Continued*)

Interventions	Specific herbal regimen for each group compared with placebo; Herb A = Liu-Wei-D-Huang-Wan, Herb B: Shen-Ling-Bia-Shu-San, Herb C: Jai-Wei-Si-Jun-Zi-Tang. 1 pack tds for 6 months
Outcomes	Overall effectiveness rating, Symptoms score (5 point scale 0-4 = severe) for day, night symptoms, cough & morning tightness, laboratory results (not extracted as not a defined outcome measure), subjective improvement
Notes	Country: China

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	No	Allocated according the order of visiting
Allocation concealment?	No	Order of visit not likely to result in well-concealed allocation
Blinding? All outcomes	Yes	Placebo packs were identical

Hsu 2005

Methods	Randomised, placebo controlled, double-blind study. Description of withdrawals and reasons for withdrawal was given
Participants	Methods section says the trial is in children aged 5-18 years. 100 patients were enrolled (actual age range 5 - 55 years). 800mg group: 40 enrolled, 33 completed the study (19 male, 14 female) . 400mg group: 40 enrolled, 29 completed the study (19 male, 10 female). Placebo group: 20 enrolled, 17 completed the study (13 male, 4 female). Inclusion criteria: FEV1 >60% predicted; reversibility =>15% baseline following inhalation of bronchodilator; 2 positive skin-prick tests, history of atopy. Exclusion criteria: acute respiratory infection within 3 wks of study; systemic glucocorticoid treatment treatment in the 3 months prior to the study; past adverse reactions to theophylline or glucocorticoids; ADD, behavioural disorder, alcohol/drug abuse, psychological / emotional disorders, pregnancy, lactation
Interventions	Mai-Men-Dong-Tang (5 herbs: Ophiopogon, American Ginseng, Pinellia, Licorice, Lantern Tridax). Given as encapsulated powder: 800mg dose, 400 mg dose or placebo, given in twice daily doses. Each capsule weighed 400 mg
Outcomes	FEV1; IgE; symptom scores
Notes	Country: China. There were Inconsistencies in the paper: patient population recruited from patients aged 5-18 but Table 2 indicates oldest patient was 55; Dosage reported as 80 mg & 40 mg, or 800 mg & 400 mg. (Only noted once as 80 & 40 so assume the corect dose is 800mg & 400mg) Results in text inconsistent with results in Table 3; PEF reported in text but not in the Table 3; Withdrawals high,

	many are put down to 'administrative reasons'; Patient numbers presented in Figure 2 do not add up; Contacted author for clarification 07/06/06 but have received no response to date

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Method of randomisation not described
Allocation concealment?	No	Patients were aware there was a greater chance of being in a treatment group than the placebo group
Blinding? All outcomes	Yes	Placebo was prepared to taste, smell and look similar to the treatment

Juergens 2003

Methods	Randomised, double-blind, placebo-controlled, prospective trial. Withdrawals not described
Participants	33 patients met inclusion criteria, one withdrew consent due to ilness, therefore: 32 subjects age 32-75 meeting NHLBI criteria for asthma recruited from asthma OP Clinic, Bonn University Hospital. All receiving 5-24mg prednisone daily, inhaled steroids, LABAs & theophylines in constant doses throughout study. SABA used in variable dosages.Exclusion criteria: BMI>27, pregnancy, lactation, hypersensitivity to essential oils, treatment with other secrotolytic agents and leucotriene antagonists, respiratory infection within 6 weeks of study commencing
Interventions	1.8-cineol (Soledum Capsules) 200mg t.i.d. or identical palcebo capsules from same manufacturer. Capsules had no taste or smell. 2 month run in. Study visits at baseline, 3, 6, 9, and 12 weeks. Compliance was monitored. Lung function tested at each visit
Outcomes	Change from baseline oral steroid dosage (mg), days stable on reduced dose, dyspnoea scores, patient global assessment of efficacy, Physician global assessment of efficacy, Cumulative dose reductions, lung function with 2.5mg reduction prednisolone, lung function with 5mg reduction prednisolone
Notes	Country: Germany. Study funded by manufacturer. Harms: heartburn & gastritis

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Yes	Randomisation by "rancode system"
Allocation concealment?	Yes	Allocation by the "rancode system"
Blinding? All outcomes	Yes	Identical presentation of treatments

Khayyal 2003

Methods	Randomised, placebo-controlled, single-blind. One withdrawal from placebo group
Participants	46 (36 male) asthmatics age 19-52 diagnosed GINA/NIH criteria, admitted to Hosp Cairo. Exclusion criteria - adverse effects during Rx, excessive >4/day use of SABA, coticosteroid use in past 2 months, allergic history, acute asthma in last 6 months or significant co-morbisity eg daibetes hypertension. Inclusion criteria: on oral theophyllines with FEV1 >80% (mild) or 60-80 (moderate) with >15% increase in FEV1 on reversibility testing
Interventions	1 sachet of propolis extract (silver sachet) or placebo (white sachet) daily in a milky drink for 2 months. Patients continued their usual treatment
Outcomes	Pulmonary function tests, no. of nocturnal attacks, daily use of rescue medication
Notes	Country: Egypt. Blinding inadequate: treatment and control provided in different coloured packets

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Method of randomisation not described
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	No	Treatment and placebo presented in different coloured sachets

Lau 2004

Methods	Randomised, double-blind, placebo-controlled
Participants	60 patients aged 6-18 yrs with mild-moderate asthma recruited from the Loma Linda Children's hospital. 30 in each group, 18 males in placebo group, 17 in Pcynogenol group, mean age 14yrs for both groups. 4 patients on zafirlukast in the placebo group and 5 in the Pycnogenol group. Inclusion: patients showing asthma symptoms defined by ATS criteria; FEV1 50-85% predicted; no severe asthma attack or lower respiratory tract infection in the month prior to the trial. Exclusion: subjects who were not able to co-operate with pulmonary function/lab. tests; subjects not able to swallow pills; patients on steroidal or NSAIDs
Interventions	Pycnogenol 1 mg/lb body weight in 2 divided doses, or placebo twice a day for three months. Rescue inhaler (albuterol) allowed
Outcomes	PEF; use of rescue inhaler; use of oral medication (zafirlukast); symptom scores; Leukotrienes (not extracted)
Notes	Country: USA. No adverse effects reported

Risk of bias

Lau 2004 (*Continued*)

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Method of randomisation not described
Allocation concealment?	Yes	Treatment and placebo were identified by pre-assigned codes prepared by an idependent laboratory that was not involved in conducting the study
Blinding? All outcomes	Yes	Identical placebo

Lee 2004

Methods	Randomised, placebo-controlled, double-blind, crossover with a 1-week wash-out period prior to the study & between randomisation periods. No withdrawals (16 enrolled & completed study)
Participants	Hospital outpatients, 16 atopic asthmatics (7 female), mean age 45, all patients on inhaled corticosteroids (beclomethasone n=11, budesnide n=2, fluticasone n=3), mean FEV1=2.51 L. Inclusion criteria: All sensitised to at least 2 aeroallergens incl. house dust mites confirmed by skin-prick testing, stable on ICS for at least 3 months
Interventions	Butterbur 25 mg (Petaforce ®) twice daily or indentical placcebo capsule for one week. Patients continued on their usual inhaled corticosteroids throughout the study but were required to stop their LABAs during the 1-week washout prior to the study and for the duration of the study
Outcomes	AMP bronchial challenge (not extracted), FEV1, PEF, FEF, exhaled nitric oxide
Notes	Country: UK (Scotland)

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Method of randomisation not described
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	Yes	Indentical placcebo

Mansfeld 1998

Methods	Randomised, double-blind, crossover trial. There were 4 withdrawals
Participants	28 patients from hospital outpatient clinic (4 drop-outs); 13 female/15 male mean age 7.8 (SD 2. 5). Inclusion: children 4-12 years, 10% FEV1 post-fenoterol. Exclusion: Had a known sensitivity to ivy leaf extract; Airway resistance >0.9kPa/l/sec; Airway infection 3 days before initiation of therapy (patients were excluded who had a chest infection during the course of the trial; Concurrent treatment with antibiotics; Treatment with a mucolytic/secretoloytic agent, theophylline or steroids
Interventions	Ivy leaf extract: one pill taken twice daily (35mg at 8am and 7pm). Placebo was taken at the same dose. Treatment was over two three-day periods with a washout of between 3 and 5 days
Outcomes	FEV1, FVC, VC
Notes	Country: Germany. Translated from German

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Method of randomisation not described
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	Unclear	Not described

Mathew 1974

Methods	Randomised, double-blind, placebo controlled trial.
Participants	123 patients, no information on gender or ages. Numbers of seasonal, irregular and perennial sufferes given for each group. 59 patients in treatment group, 64 in placebo group in week 1. By week 12, 4 patients had dropped out of the treatment group and 3 from the placebo group. Patients were getting asthma symptoms daily or several times a week for the past few weeks and had a past history of symptoms. Exclusions: chronic bronchitis, emphysema, tropial eosinophilia, bronchial carcinoma, heart disease, acute respiratory infections, exacerbation of infection, steroid-dependents
Interventions	Treatment: alkaloids of Tylophora indica extracted from dried leaves. Dose was 0.5 mg mixed with 0.5gm of glucose. Placebo was glucose mixed with juice of spinach leaves so powders were alike in appearance. One packet of tylophora or placebo to be taken daily at 6am for six days. Advised not to eat anything for two hours afterwards and then have a light breakfast
Outcomes	Symptom scores, amount of prescribed drugs used, physical sign scores, total clinical improvement, FEV1, PEFR, side effects
Notes	Country: India. Adverse effects: nausea, vomiting, sore mouth, loss of taste for salt. These symptoms disappear within 1-2 days after stopping the drug, except sore mouth which can last 3-4 days. Number of patients assessed for FEV1 & PEFR are lower than for the other outcomes. No

Mathew 1974 (*Continued*)

	explanation for this is given	
Risk of bias		
Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Yes	Randomisation was by use of a randomisation table.
Allocation concealment?	Yes	Coding of treatment and placebo was done by a statistician and then handed over to the health visitor-technician
Blinding? All outcomes	Yes	Placebo and treatment powders alike in appearance and coded. Coding was revealed at the end of the study

Murali 2006

Methods	Randomised, double-blind, placebo-controlled parallel group trial	
Participants	94 Volunteers with asthma age 15-50 recruited from hospital notice board advert, Chennai India. Incusion criteria >15% improvement FEV1 post bronchodilator. Exclusion criteria were smokers, various other respiratory conditions	
Interventions	Randomisation to 4 arms: 3 caps daily of herbal preparation DCBT4567-Astha-15 (22) salbutamol plus theophylline (24), salbutamol alone (24) or placebo (24) for 12 weeks	
Outcomes	clinical symptoms, FEV1 and a 15% improvement in FEV1	
Notes		
Risk of bias		
Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Yes	A lottery methods was used where tokens were drawn out of a bag and assigned to the treatment arm A, B, C, or D
Allocation concealment?	Yes	Randomisation performed by third party
Blinding? All outcomes	Yes	Identidal placebo capsules and biomedical drug capsules.

Rouhi 2006

Methods	Randomised, placebo controlled trial.
Participants	92 asthmatics receiving treatment for >12 months, age & gender not stated
Interventions	20 drops ginger solution 8hrly or placebo, probably one month run in & 1 month treatment period, possibly 2 month treatment period
Outcomes	Presence or absence of symptoms, use of "spray" (presume inhaler but not defined), spirometry
Notes	

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Method of randomisation not described
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	Unclear	Not described

Sekhar 2003

Methods	Placebo-controlled trial. Patients divided into three groups, but not specified as being randomised
Participants	60 in or outpatients with asthma illness duration 6-24months
Interventions	DC 3 tablets tds for 6 weeks (20 subjects) or standard regime tabs plus liquid (20 subjects) or placebo 2 capsules (wheat powder) tds
Outcomes	Symptoms and PEFR
Notes	Country: India. 4 dropouts (reasons not given) results for other 24 given. Contacted author to clarify if allocation was randomized or not. No response to date. Decided to include this study as it is a placebo-controlled comparison

Risk of bias

Item	Authors' judgement	Description
Adequate sequence generation?	Unclear	Does not report if the study is randomised or not.
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	Unclear	Not described

Shivpuri 1969

Methods	Randomized, double-blind, placebo controlled
Participants	110 patients, 53 in Tylophora Group age10-45+, 57 in placebo group, age 10-45+. No breakdown of gender. Diagnosis of asthma based on history of recurrent dyspnea and rest relieved by epinephrine or ephedrine, confirmed by rhonci during attack. Majority of patients had allergies to one or more of pollens, dust mites, fungal spores atc
Interventions	Tylophor indica leaves and spinach leaves (placebo) cut into small pieces and put in coded bags (A & B). Dose was one leaf daily for 6 days. Patients and medical staff were blinded to the coding. Normal medication allowed. The powders were taken for 6 days and patients were followed up afterwards until the 12th week
Outcomes	Frequency of symptoms; severity of symptoms; amount of prescribed drugs taken in 24 hours; presence & severity of lung signs during normal and forced expiration
Notes	Country: India. There were two trials - second is partial crossover. Date extracted from first part of study only. Side effects: 53% of Tylophora group compared to 9% of placebo group experienced side-effects (sore mouth, loss of taste for salt, morning nausea/vomiting)

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Method of randomisation not described
Allocation concealment?	Yes	Coding of placebo and treatment done by third party
Blinding? All outcomes	Yes	Spinach used as placebo and presented in the same way as the treatment

Shivpuri 1972

Methods	Randomised, double-blind, controlled trial
Participants	195 patients, 103 in the Tylophora Group (48 male), 92 in the placebo group (43 male), ages not given. Diagnosis as per Shivpuri 1969. 22 patients dropped out of the Tylophora Group, 8 from the placebo Group by the 12th week
Interventions	Dry alcholic extract of Tylophora leaves with 1g glucose powder, or placebo (1g glucose). Normal drugs prescribed
Outcomes	Clinical improvement based on frequency, severity of symptoms and amount of prescribed drugs which had to be taken. Adverse events
Notes	Country: India, There were two trials - second is partial crossover. Data extracted from first part of study only. Adverse effects were: nausea, vomiting, sore mouth, loss of taste for salt. Some patients experience more than one side effect at a time

Shivpuri 1972 (*Continued*)

Risk of bias		
Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Method of randomisation not described
Allocation concealment?	Yes	Coding of placebo and treatment done by third party
Blinding? All outcomes	Yes	Placebo coloured with juice of spinach leaves to simulate the colour of the active treatment

Tamaoki 1995

Methods	Randomised, placebo controlled, but not described as double-blind. 2 patients withdrew from treatment group. Two week run-in period
Participants	23 non-smokers with mild asthma, 12 males, 11 females aged 19-46 years. 2 patients were withdrawn from menthol group due to uncomfortable sensation in upper airway, 21 patients completed the study. Treatment= 11, control=10. Participants had occasional symptoms controlled by b2-agonists on demand. None had experienced an exacerbation or infection in the previous 4 weeks. No description of exclusion criteria, presumably exacerbation/infection in previous 4 weeks was an exclusion critera
Interventions	Nebulized menthol 10 mg twice a day (manufactured by Hohei Co.) for 4 weeks. Matching placebo for four weeks, does not state what the placebo is. B2-agonists allowed
Outcomes	Vital capacity, FEV1, change in PEFR, provocative concentration of methacholine, wheezing episodes/week, MDI inhalation puffs/week
Notes	Country: Japan.

Risk of bias		
Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Method of randomisation not described
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	Yes	Matching placebo

Thiruvengadam 1978

Methods	Randomised, placebo-controlled, crossover, double blind trial
Participants	15 patients, gender and ages not reported, 7 in the placebo first group, 8 in the Tylophora group first. Inclusion criteria: history of asthma for at least 2 years with demonstrable reversal. Subjects had an average of 4 wheezing attacks per week during the pre-trial observation
Interventions	Powdered Tylophora leaf given in capsule form 350mg per capsule. The placebo was lactose in capsule form. Administered by staff once per day at 9am for seven days. There was a two-day washout, then the groups crossed over for another seven days
Outcomes	Symptom scores (Wheezing attacks; nocturnal dyspnoea; cough; chest tightness measures on a scale of 0-4 where 0 =good), maxmum breathing capacity (MBC), vital capacity (VC); Peak Expiratory Flow (PEF)
Notes	Country: India. Washout only 2 days - previous studies show Tylophora can have an effect for weeks after stopping taking it. The second study in paper compares leaf to standard therapy - this study was not considered

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Method of randomisation not described
Allocation concealment?	Unclear	Coding not revealed until the end of the trial, but does not specify that the coding was done by a third party
Blinding? All outcomes	Yes	Treatment & placebo capsules were identical

Thomas 2006

Methods	Randomised, double-blind placebo controlled, crossover trial. 36 week trial: 4weeks baseline, 12 weeks treatment, 8 weeks washout and 12 weeks treatment period
Participants	32 asthmatics (8 male) aged 22-73 years, median daily dose beclomethasone 800 mcg (range 0 - 4000)
Interventions	Treatment was AKL1, a herbal mixture including Gingko bilboa, (no info. on doseage). No info. on content of placebo, usual medication was allowed
Outcomes	FEV1, PEF, Asthma Control Questionnaire (ACQ), Asthma Quality of Life Questionnaire (AQLQ) , Leicester Cough Questionnaire (LCQ)
Notes	Country: UK (Scotland); no significant adverse effects. Presented as conference abstract. Author contacted for further information on the treatment ingrediants and dosage 05/07/2006

Thomas 2006 (*Continued*)

Risk of bias		
Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Method of randomisation not described
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	Yes	Identical placebo

Urata 2002

Methods	Randomised double-blind, placebo-controlled, crossover design. Washout period of 4 weeks before crossover
Participants	33 adults (15 male) age 42 (SD 7); FEV1 81.5 (SD6.9)% predicted. Non smokers, atopic asthma confirmed with skin prick testing, mild to moderate asthma on ATA criteria. Users of herbal medicines, ICS or oral or LTRA excluded. All used SABA and/or theophyline
Interventions	Four week course daily of 2.5g powdered TJ-96 -Saiboku-to (mixture of 10 herbs) or placebo, then 4 week washout, then crossover
Outcomes	FEV1, FVC, symptoms scores (plus methacholine and blood results not extracted)
Notes	Country: Japan. Results not reported as mean differences & SE, but as a parallel trial. Went from 33 patients in methods to 32 in results - did 1 person drop-out? No adverse effects reported

Risk of bias		
Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Method of randomisation not described
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	Yes	Placebo identical in appearance and taste

Ziboh 2004

Methods	Randomized, double-blind trial with placebo control. Twelve month duration
Participants	80 screened, 54 included (no. patients in each group not explicitly stated so have assumed there are 27 in each group). No mention of withdrawals. 11 male and 43 female patients. Average ages in the Borage group: male 52, female 42. Placebo Group: male 53, female 45. Total age range 16-71. Inclusion: patients aged 16-75 with mild or moderate persistent asthma

Ziboh 2004 (*Continued*)

Interventions	Borage oil containing 500 mg GLA and 13 IU of vitamin E. Placebo was corn oil capsule containing 13 IU vitamin E. Dose was two capsules twice a day with meals. Patients remained on their usual medication
Outcomes	FEV1 only outcome extracted.
Notes	Country: USA

Risk of bias

Item	**Authors' judgement**	**Description**
Adequate sequence generation?	Unclear	Method of randomisation not described
Allocation concealment?	Unclear	Not described
Blinding? All outcomes	Yes	Placebo identical in appearance to treatment

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Adalioglu 1994	Prescription drug
Anon 1973	Trial in healthy smokers
Anon 2004	Not a trial
Bai 2005	"Random allocation" was mentioned. We telephoned the author, and discovered that randomisation process was specified as "according to the visit order". This was not adequate for the purposes of the review
Bai 2006	The outcomes used in the trial were not match the inclusion criteria of the review: FVC, FEV1, PEF, V50, V25
Bauer 1993	Prescription drug
Cai 2006	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + TCM spray inhalation versus western routing treatment
Cao 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: mounting TCM on the acupoints versus TCM decoction orally
Cao 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine

(*Continued*)

Chachaj 1972	No placebo control
Chang 2006	Very few participants allocated to placebo - unlikely to have been adequately randomised
Charpin 1979	Treatment administered by smoking herbal cigarette
Chatterjee 1999	Trial in rats
Chen 2003a	No placebo control
Chen 2003b	Acute asthma
Chen 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Aminophylline
Chen 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction adjunct to TCM proprietary versus TCM proprietary
Chiyotani 1994	Before and after study
Choudry 1990	Healthy subjects
Cui 2000	TCM + ketotifen versus no treatment
Danesch 2004	Not randomised
DAS 1964	Not randomised
Davies 1975	Single chemical extracted from herb. Single dose study (no long-term outcomes of treatment)
Debelic 1986	Not a clinical trial
Deng 2006	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus another self-prepared TCM decoction + western medicine
Dong 1988	Not randomised
Doshi 1983	Inadequate placebo control. Not possible to compare treatment with placebo due to different lengths of placebo/ treatment schedules in each group
Du 1995	Patients had both asthma and chronic bronchitis. Asthma outcomes not reported separately
Du 2006	The interventions used in the trial did not meet the inclusion criteria of the review: acupuncture and cupping therapy + western medicine versus western medicine
Egashira 1993	No placebo control

(*Continued*)

Fan 2001	Nebulised TCM versus beta receiptor kinetin
Fan 2006	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus western medicine
Fang 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: fair acupuncture versus Becotide spray. The outcomes were also not matched
Fang 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: TCM Xixinnao injection versus Aminophylline injection, the outcomes were also not matched, too
Feng 2000	Non-random allocation to treatment
Feng 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: Aminophylline + self-prepared decoction versus Aminophylline
Feng 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: self prepared TCM decoction versus Bricanyl and Pulmicort
Fu 2002	In appropriate study population
Gao 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Ketotifen and Promethazine
Gao 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus another TCM decoction
Gao 2006c	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus aminophylline
Gattari 1963	Review article.
Gen 2004	Self-prepared TCM decoction versus Western medicines
Geng 2001	TCM versus Western medicine
Geng 2003	TCM versus antibiotics
Gore 1980	Case-control study
Grimm 1987	Before and after study
Gu 2006	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western
Gulyas 1997	Comparing two methods of administration: syrup and drops

(*Continued*)

Guo 2006	The interventions used in the trial did not meet the inclusion criteria of the review: Pulmicort spray plus TCM versus pulmicort spray
Haggag 2003	Active control (regular tea)
Han 2000	No placebo control (TCM versus prenisone and terbutaline).
Han 2006	The interventions used in the trial did not meet the inclusion criteria of the review:TCM decoction versus Seretide spray
He 2004	The interventions used in the trial did not meet the inclusion criteria of the review: the TCM mixed with glucocorticoid was used
He 2005	TCM internal combined with external treatment versus external treatment
Hong 1999	Juanxiao tablet + placebo versus Maojinyou capsule + placebo
Hong 2006	The interventions used in the trial did not meet the inclusion criteria of the review: TCM injection + western medicine versus Ceftriaxone + western medicine
Hu 1997	Inappropriate study population
Hu 2002	TCM + becotide versus becotide
Hu 2004	Assessment of lymphocyte subgroups.
Hu 2005	The interventions used in the trial did not meet the inclusion criteria of the review: self prepared TCM cream mounting on the acupoints, Summer using versus using in whole year
Hu 2006	The interventions used in the trial did not meet the inclusion criteria of the review: self prepared TCM decoction adjunct to western routine treatment versus western routine treatment, Salbutamol spray was used for acute onset cases
Huang 2004	Self-prepared TCM decoction versus Pulmicort aerosol+Bricanyl+Ketotifen versus Bricanyl + Ketotifen
Huang 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Meptine, Becotide, Ketotifen
Huang 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: routing medications + Xixinnao injection versus routing medications
Huang 2006c	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + glucocortisone versus glucocortisone
Hulks 1989	Dose ranging study. Very short outcomes (maximum 30 minutes post-inhalation)
Ianovitskii 1951	Non-controlled, open trial

(*Continued*)

Iyengar 1994	No control group
Jackson 2004	Atopic patients; study did not assess asthma outcomes
Jia 2006	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Jiang 2001	Atomised TCM Yulan magnolia flower bud versus Chuankangxu
Jiang 2006	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Jiang 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus western medicine
Jiang 2006c	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + cupping + western medicines versus western medicines
Juergens 2001	Interview not trial report
Kalin 2003	Review article
Kalus 2003	Only 5/63 patients are asthmatic. The only outcome reported for the asthmatics is 'subjective improvement'
Kang 2003	TCM paste on acupoints versus ketotifen
Karandikar 1965	No control group
Knox 1988	Histamine challenge. Outcomes assessed 30, 60, 90, 120 minutes post-inhalation
Kong 2001	Western medicine routine + TCM versus Western medicine routine
Kong 2006	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Kumar 1996	Before and after study, no control group
Lai 2006	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Li 1996	TCM versus aminophylline
Li 2004	In adequate randomisation procedure ("discussed with patients")
Li 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: TCM decoction plus routing treatment versus routing treatment

(*Continued*)

Li 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: TCM decoction plus routing treatment versus cortisone spray versus ketotifen tablet
Li 2006c	The interventions used in the trial did not meet the inclusion criteria of the review: TCM decoction plus routing treatment versus oral asmeton
Li 2006d	The interventions used in the trial did not meet the inclusion criteria of the review: Huangqi Keli + glucocortison spray versus glucocortison. The outcomes were also not match, too
Li 2006e	The interventions used in the trial did not meet the inclusion criteria of the review: Jizhi Tangjiang + western medicine versus western medicine
Li 2006f	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Bambec
Li 2006g	The interventions used in the trial did not meet the inclusion criteria of the review: Flixotide + Jing Shui Bao capsule versus Flixotide
Li 2006h	Inadequate randomisation (allocation performed on an optional basis by trialist)
Li 2006i	The interventions used in the trial did not meet the inclusion criteria of the review: Self-prepared TCM decoction versus Ketotifen capsul
Li 2006k	The interventions used in the trial did not meet the inclusion criteria of the review: Self-prepared TCM decoction + western medicine versus western medicine
Li 2006l	The interventions used in the trial did not meet the inclusion criteria of the review: Self-prepared TCM decoction + western medicine versus western medicine
Li 2006m	The interventions used in the trial did not meet the inclusion criteria of the review: Self-prepared TCM decoction + western medicine versus western medicine
Li 2006n	The interventions used in the trial did not meet the inclusion criteria of the review: Self-prepared TCM decoction + western medicine versus western medicine
Li 2006o	The interventions used in the trial did not meet the inclusion criteria of the review: Self-prepared TCM decoction + western medicine versus western medicine
Liang 2006	The interventions used in the trial did not meet the inclusion criteria of the review: Self-prepared TCM decoction versus Meptin
Lin 2004	Inappropriate study population
Liu 2001	Not relevant comparison
Liu 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: Ding Xiao Ying decoction versus aminophylline

(*Continued*)

Liu 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: inhalation corticosteroid + self-prepared TCM decoction versus inhalation corticosteroid
Liu 2006c	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Aminophylline
Liu 2006d	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Aminophylline
Liu 2006e	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Theophylline, outcomes were also not matched
Liu 2006f	The interventions used in the trial did not meet the inclusion criteria of the review: one TCM injection + western medicine versus another TCM injection + western medicine
Liu 2006g	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Aminophylline + Ketotifen
Liu 2006h	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Liu 2006i	The interventions used in the trial did not meet the inclusion criteria of the review: self prepared TCM decoction + western medicine versus western medicine
Lu 1995	TCM + Tuina versus Tuina versus TCM
Lu 2004	TCM paste on acupoints versus ketotifen
Luo 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus another TCM preparation + western medicine
Luo 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Tranilast
Ma 2006	The interventions used in the trial did not meet the inclusion criteria of the review: routing western medicine + Ping Chuan capsule versus routing western medicine
Mansfeld 1997	Comparing two methods of administration: syrup and drops
Nakajima 1993	No placebo control
Okazaki 1993	Before and after study
Peng 2006	The interventions used in the trial did not meet the inclusion criteria of the review: routing western medicine + self-prepared TCM decoction versus routing western medicine
Rafinski 1974	Not a randomised trial

(*Continued*)

Rajaram 1975	Not a randomised trial, no control group
Reiser 1985	Not a herbal intervention
Ren 2006	The interventions used in the trial did not meet the inclusion criteria of the review: routing western medicine + self-prepared TCM decoction versus routing western medicine
Sha 2006	The interventions used in the trial did not meet the inclusion criteria of the review: compared one method of TCM cream mounting to another method of TCM cream mounting
Sha 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: Western medicine + Becotide spray + self-prepared TCM decoction versus western medicine + Becotide spray
Shah 1977	No placebo control: comparing high dose and low dose of treatment
Shah 1987	COPD/bronchitis not asthma
Shao 2005	The interventions used in the trial did not meet the inclusion criteria of the review: Shaoshi acupuncture method versus general acupuncture acupoints
Shen 2006	The interventions used in the trial did not meet the inclusion criteria of the review: TCM proprietary cream mounting on acupoints + Aminophylline versus Aminophylline alone
Shi 2001	TCM points shot + oral TCM + hormone versus TCM points shot + oral another TCM tablete versus TCM points shot + oral TCM + antiasthma routine
Shivpuri 1973	Not randomized controlled trial
Shu 2006	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus another TCM decoction
Singh 1996	Not placebo controlled
Song	Basic treatment+huangqi oral liquid versus basic treatment+ketotifen
Song 2006	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Sun 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Pulmicort or Bricasol
Sun 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: Self-prepared TCM decoction versus Ketotifen and Aminophylline
Tan 2002	Self-prepared TCM decoction plus Xiaozhendao versus penicillin
Thompson 2003	Overview of a systematic review

(*Continued*)

Tong 2006	The interventions used in the trial did not meet the inclusion criteria of the review: Self-prepared TCM decoction + western medicine versus western medicine
Tu 2006	The interventions used in the trial did not meet the inclusion criteria of the review: Chuanxiongqi injection versus aminophylline injection
Umesato 1982	Not described as randomised or placebo controlled. The outcomes assessed (serum cortisol, ACTH, free fatty acids) are not relevant to this review
Vincent 1963	Not a trial
Wang 2002	Budesonide plus TCM versus budesonide alone
Wang 2003	Jiexiao Oral Liquid versus virazole
Wang 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared Ping Chuan Tang decoction versus aminophylline
Wang 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: TCM preparation versus Meptin
Wang 2006c	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM cream mounting versus Aminophylline orally
Wang 2006d	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Ketotifen
Wang 2006e	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Wang 2006f	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Wang 2006g	This was a quasi-RCT. The interventions used in the trial were not match the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Wang 2006h	This was a quasi-RCT. The interventions used in the trial were not match the inclusion criteria of the review: self-prepared TCM decoction versus self-prepared TCM decoction + Pumicort spray versus Pumicort spray
Wang 2006i	The interventions used in the trial did not meet the inclusion criteria of the review: TCM inhalation + western routing treatment versus western routing treatment
Wang 2006j	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Salbutamol
Watanabe 2003	Not placebo controlled
Wei 1996	COPD

(*Continued*)

Wei 2006	Children included were younger than 3 years old and the interventions used in the trial were not match the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Wen 2005	Herbal intervention versus steroid, not versus placebo
Wilde 1980	Review article
Wilkens 1990a	Treatment period is only two days. Study is looking at early asthmatic response to exercise challenge
Wilkens 1990b	Study 1: no placebo control; study 2: cold air challenge; study 3: exercise challenge
Wu 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Theophylline-Medtech
Wu 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Wu 2006c	The interventions used in the trial did not meet the inclusion criteria of the review: Self-prepared TCM decoction + western medicine versus western medicine
Xia 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus xiao qing nong tang decoction
Xia 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Xiao 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Xiao 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Xie 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + Becotide spray versus Aminophylline + Becotide spray
Xie 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Xu 1996	Bu fei ding chuan tang versus Xiao qing nong tang, Qin fei bu shen tang versus Ding chuan tang
Xu 2000	Active control
Xu 2004	Tripterygium polyglucosideo versus Beta 2 receipt incitant
Xu 2005	Inappropriate study population
Xu 2006a	TCM Xiaochuankang versus TCM Hajie dingchuanwan versus Western medicine

(*Continued*)

Xu 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: Meptin + TCM decoction versus Meptin
Xu 2006c	The interventions used in the trial did not meet the inclusion criteria of the review: routine treatment + self-prepared TCM cream mounting on acupoints versus routing treatment
Yan 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: routine treatment + self-prepared TCM decoction versus routine treatment
Yan 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: routine treatment + self-prepared TCM decoction versus routine treatment
Yan 2006c	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction versus Aminiphylline. Also, the children were younger than 21 months
Yang 2005	The original author was telephone interviewed and it's had known that the "randomisation not performed strictly. "
Yang 2006	The interventions used in the trial did not meet the inclusion criteria of the review: Self-prepared TCM decoction + western routine medicine versus western routine medicine
Yao 2000	Self-prepared TCM decoction versus becotide and ketotifen
Yao 2006	The interventions used in the trial did not meet the inclusion criteria of the review: Bricanyl + self-prepared TCM cream mounting versus Bricanyl
Ying 2006	The interventions used in the trial did not meet the inclusion criteria of the review: Self-prepared TCM decoction + theophylline versus theophylline
Yu 2006a	Both groups used same TCM cream
Yu 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: Self-prepared TCM decoction versus pulmicort spray or salbutamol spray
Yu 2006c	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + Budesonide spray versus Budesonide
Zen 2006	The interventions used in the trial did not meet the inclusion criteria of the review: Tianqiu TCM cream mounting on acupoints versus routing western medicine
Zen 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: sefl-prepared TCM decoction + western medicine versus western medicine
Zhang 1997	Inappropriate study population
Zhang 2000	No placebo control
Zhang 2002	Different TCMs compared.

(*Continued*)

Zhang 2002a	Inappropriate study population
Zhang 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: TCM + western medicine versus western medicine, and the outcomes not match, too
Zhang 2006b	The interventions were not matched to the including criteria of the review: self-prepared TCM decoction versus Prednisone
Zhang 2006c	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM capsule versus Medrol
Zhang 2006d	The interventions used in the trial did not meet the inclusion criteria of the review: acupuncture + routine treatment versus routine treatment
Zhang 2006f	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + western medicine versus western medicine
Zhao 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: TCM + western medicine versus western medicine, and the outcomes not match, too
Zhao 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction + Theophylline or salbutamol versus Theophylline or salbutamol
Zhen 2002	TCM + western medicine versus western medicine
Zhen 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM proprietary versus Aminophylline + Clarityne
Zhen 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM proprietary + western medicine versus western medicine
Zhong 1987	Not randomised
Zhou 1997	Randomly select patients, but allocation method did not mentioned
Zhou 1999	Basic treatment + Sodium Esculoside versus basic treatment + cortisone
Zhou 2003	TCM adjuncted with becotide versus becotide and ketotifen
Zhou 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: one TCM decoction versus another TCM decoction
Zhou 2006b	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction and cream versus several western medicine
Zhou 2006c	The interventions used in the trial did not meet the inclusion criteria of the review: self-prepared TCM decoction with western medicine versus western medicine
Zhu 1998	TCM + western medicine versus western medicine

(*Continued*)

Zhu 2002	Inappropriate study population
Zhu 2006a	The interventions used in the trial did not meet the inclusion criteria of the review: TCM + western medicine versus western medicine
Zhu 2006b	Non-RCT
Ziolo 1998	No placebo control

Characteristics of ongoing studies *[ordered by study ID]*

Luciuk 2003

Trial name or title	Effect of a botanical preparation on patients with moderately severe steroid-dependent asthma and allergic rhinitis
Methods	
Participants	10 patients with moderately severe steroid dependent asthma, rhinitis and conjunctivitis
Interventions	A 'botanical preparation'
Outcomes	FEV1; MMEF; FVC; peak flows; symptom scores; ; quality of life
Starting date	2003
Contact information	GH Luciuk, Richmond Hospital, British Columbia
Notes	Waiting full publication of results. Trial presented as conference abstract in September 2003

NCCAM

Trial name or title	Borage oil and ginko bilboa (EGb 761) in asthma
Methods	
Participants	Expected enrollment: 280; ages 16-75 years. Inclusion criteria: symptoms consistent with the National Asthma Education Program guidelines for mild to moderate persistent asthma. Exclusion criteria: severe asthma or mild intermittent asthma; use of prednisone in past 3 months; concurrent pulmonary disease; pregnancy; emergency room care in last 6 months; cigarette smoking in past year; recent respiratory infection; current use of dietry supplements; use of homeopathic remedies, acupuncture, acupressure or therapeutic massage
Interventions	Ginkgo bilboa and Borage oil
Outcomes	Clinical efficacy; adverse effects

NCCAM (*Continued*)

Starting date	2002
Contact information	National Center for Complementary and Alternative Medicine
Notes	Study ID number: 1 R01 AT00637-02

DATA AND ANALYSES

Comparison 1. Boswellia extract vs. placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Mean attacks / week	1	42	Mean Difference (IV, Fixed, 95% CI)	-1.76 [-2.94, -0.59]
1.1 Group A (mild)	1	14	Mean Difference (IV, Fixed, 95% CI)	-0.57 [-1.97, 0.83]
1.2 Group B (moderate)	1	14	Mean Difference (IV, Fixed, 95% CI)	-4.14 [-6.47, -1.81]
1.3 Group C (severe)	1	14	Mean Difference (IV, Fixed, 95% CI)	-7.10 [-12.66, -1.54]
2 Mean night attacks / week	1	42	Mean Difference (IV, Fixed, 95% CI)	-1.38 [-1.92, -0.84]
2.1 Group A (mild)	1	14	Mean Difference (IV, Fixed, 95% CI)	-1.28 [-2.00, -0.56]
2.2 Group B (moderate)	1	14	Mean Difference (IV, Fixed, 95% CI)	-2.0 [-3.05, -0.95]
2.3 Group C (severe)	1	14	Mean Difference (IV, Fixed, 95% CI)	-0.72 [-2.05, 0.61]
3 Mean FVC	1	42	Mean Difference (IV, Fixed, 95% CI)	5.92 [-0.34, 12.19]
3.1 Group A (mild)	1	14	Mean Difference (IV, Fixed, 95% CI)	5.30 [-9.64, 20.24]
3.2 Group B (moderate)	1	14	Mean Difference (IV, Fixed, 95% CI)	1.70 [-8.78, 12.18]
3.3 Group C (severe)	1	14	Mean Difference (IV, Fixed, 95% CI)	9.40 [0.23, 18.57]
4 FEV1 % predicted	1	42	Mean Difference (IV, Fixed, 95% CI)	7.24 [1.46, 13.02]
4.1 Group A (mild)	1	14	Mean Difference (IV, Fixed, 95% CI)	7.20 [-2.30, 16.70]
4.2 Group B (moderate)	1	14	Mean Difference (IV, Fixed, 95% CI)	-0.40 [-12.09, 11. 29]
4.3 Group C (severe)	1	14	Mean Difference (IV, Fixed, 95% CI)	12.10 [2.81, 21.39]
5 PEF (SMD)	2	122	Std. Mean Difference (IV, Fixed, 95% CI)	0.07 [-0.30, 0.43]
5.1 Group A (mild)	1	14	Std. Mean Difference (IV, Fixed, 95% CI)	0.11 [-0.94, 1.16]
5.2 Group B (moderate)	1	14	Std. Mean Difference (IV, Fixed, 95% CI)	0.06 [-0.99, 1.10]
5.3 Group C (severe)	1	14	Std. Mean Difference (IV, Fixed, 95% CI)	2.11 [0.72, 3.51]
5.4 Unclear severity	1	80	Std. Mean Difference (IV, Fixed, 95% CI)	-0.14 [-0.58, 0.30]
6 Mean attack rate / week	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
7 Change in FEV1 (L)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
8 Change in PEF (L/min)	1	80	Mean Difference (IV, Fixed, 95% CI)	44.5 [24.24, 64.76]
9 Increase in FVC (L)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

Comparison 2. Nebulized menthol vs. placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 VC % predicted	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2 FEV1 % predicted	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
3 Change in PEFR (%)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
4 Wheezing episodes / week	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5 MDI inhalation puffs / week	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

Comparison 3. 1.8-cineol (eucalyptol) vs. placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Oral steroid reduction (mg)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2 Dyspnoea scores at 3 weeks (0=never, 5=persistent)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
3 Patient's gloabl assessment of efficacy (1=very good, 4=deterioration)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
4 Physician's global assessment of efficacy (1=very good, 4=deterioration)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5 Patients tolerating a 2.5mg reduction in steroids	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
6 Patients tolerating a 5mg reduction in steroids	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
7 Patients tolerating a 7.5mg reduction in steroids	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
8 Patients tolerating a 10mg reduction in steroids	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
9 FEV1 (L) at 3 weeks	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
10 PEFR at 3 weeks (l/min)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
11 Rescue salbutamol (puffs/day) at 3 weeks	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

Comparison 4. Pulmoflex vs. placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Patients experiencing deterioration	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

Comparison 5. Mai-Men-Dong-Tang vs. placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 FEV1 (%)	1	120	Mean Difference (IV, Fixed, 95% CI)	10.52 [-21.44, 42.47]
1.1 MMDT 800mg vs. placebo	1	60	Mean Difference (IV, Fixed, 95% CI)	17.5 [-27.80, 62.80]
1.2 MMDT 400mg vs. placebo	1	60	Mean Difference (IV, Fixed, 95% CI)	3.60 [-41.49, 48.69]

2 Symptom scores	1	120	Mean Difference (IV, Fixed, 95% CI)	0.21 [-5.85, 6.28]
2.1 MMDT 800mg vs. placebo	1	60	Mean Difference (IV, Fixed, 95% CI)	-1.80 [-9.76, 6.16]
2.2 MMDT 400mg vs. placebo	1	60	Mean Difference (IV, Fixed, 95% CI)	3.0 [-6.37, 12.37]
3 Patients experiencing at least a 5% improvement in FEV1 at 4 months	1	120	Risk Ratio (M-H, Fixed, 95% CI)	8.0 [2.02, 31.71]
3.1 MMDT 800mg vs. placebo	1	60	Risk Ratio (M-H, Fixed, 95% CI)	9.0 [1.29, 62.68]
3.2 MMDT 400mg vs. placebo	1	60	Risk Ratio (M-H, Fixed, 95% CI)	7.00 [0.99, 49.52]

Comparison 6. Propolis vs. placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Number of nocturnal attacks	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2 FVC % predicted	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
3 FEV1 % predicted	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
4 PEFR % predicted	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5 FEF25-75 % predicted	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

Comparison 7. Tylophora indica vs. placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Symptom score improvement>50% (week 1)	2	258	Risk Ratio (M-H, Fixed, 95% CI)	2.02 [1.36, 3.00]
2 Drug consumption scores improvement >50% (week 1)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
3 Physical sign scores improvement >50% (week 1)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
4 Total clinical improvement >50% (week 1)	3	428	Risk Ratio (M-H, Fixed, 95% CI)	2.06 [1.61, 2.62]
5 No. pts showing >15% increase in FEV1 (week 1)	2	249	Risk Ratio (M-H, Fixed, 95% CI)	1.18 [0.89, 1.56]
6 No patients showing >20% increase in PEFR (week 1)	2	249	Risk Ratio (M-H, Fixed, 95% CI)	1.39 [1.08, 1.78]
7 No. pts experiencing side effects (week 1)	3	428	Risk Ratio (M-H, Fixed, 95% CI)	4.03 [2.33, 6.95]
8 Symptom score improvement>50% (week 12)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

9 Drug consumption scores improvement >50% (week 12)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
10 Physical sign scores improvement >50% (week 12)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
11 Total clinical improvement >50% (week 12)	3	381	Risk Ratio (M-H, Fixed, 95% CI)	1.53 [0.94, 2.48]
12 No. pts showing >15% increase in FEV1 (week 12)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
13 No patients showing >20% increase in PEFR (week 12)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
14 Symptom scores (end of treatment)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
15 FEV1 (L) (end of treatment)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
16 PEFR (L/min) (end of treatment)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
17 Symptom scores (two week follow-up)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
18 FEV1 (L) (two week follow-up)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
19 PEFR (L/min) (two week follow-up)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
20 Symptom score improvement>50% (two week follow-up)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
21 No. pts showing >15% increase in FEV1 (two week follow-up)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
22 No patients showing >20% increase in PEFR (two week follow-up)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
23 Wheezing attacks (mean score at end of week 1) CROSSOVER	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
24 Nocturnal dyspnoea (mean score at end of 1st week) CROSSOVER	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
25 Mean breathing capacity (MBC) mean daily change (L/min) CROSSOVER	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
26 VC mean daily change (L) CROSSOVER	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
27 PEF mean daily change (L/min) CROSSOVER	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

Comparison 8. Ivy leaf extract vs. placebo CROSSOVER

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Vital capacity (L)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2 Vital capacity (% change from baseline)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
3 FVC (L)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
4 FVC (% change from baseline)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5 FEV1 (L)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
6 FEV1 (% change from baseline)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

Comparison 9. Evening primrose oil vs. placebo CROSSOVER

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Mean morning PEF	1		Litres/min (Fixed, 95% CI)	Totals not selected
2 Use of bronchodilator	1		No. puffs/day (Fixed, 95% CI)	Totals not selected

Comparison 10. Tj-96 ("Saiboku-to") vs. placebo CROSSOVER

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 FEV1	1		Litres (Fixed, 95% CI)	Totals not selected
2 FEV1 % predicted	1		% predicted (Fixed, 95% CI)	Totals not selected
3 FVC	1		Litres (Fixed, 95% CI)	Totals not selected
4 FVC % predicted	1		% (Fixed, 95% CI)	Totals not selected
5 Symptom scores (0=asymptomatic, 3=severe attack)	1		Score (Fixed, 95% CI)	Totals not selected

Comparison 11. Butterbur (Petasites hybridus) vs. placebo CROSSOVER

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 FEV1	1		Litres (Fixed, 95% CI)	Totals not selected
2 PEF	1		Litres/min (Fixed, 95% CI)	Totals not selected
3 FEF 25-75	1		Litres/s (Fixed, 95% CI)	Totals not selected

Comparison 12. Borage oil vs. placebo CROSSOVER

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 FEV1 at month 12	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

Comparison 13. Pcynogenol (extract of French maritime bark) vs. placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 PEF (% predicted)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2 Albuterol puffs/24 hr	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
3 Symptom scores per day (0=no symptoms, 4=very severe)	1		Std. Mean Difference (IV, Fixed, 95% CI)	Totals not selected
4 No. subjects with decreased symptoms at 3 months	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
5 No. subjects off inhaler at 3 months	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
6 No. subjects with oral medication at 3 months	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
7 Mean FEV1 CROSSOVER	1		% predicted (Fixed, 95% CI)	Totals not selected
8 FEV1/FVC ratio CROSSOVER	1		% (Fixed, 95% CI)	Totals not selected
9 Asthma symptom score (1=mild, 4=severe) CROSSOVER	1		Symptom score (Fixed, 95% CI)	Totals not selected

Comparison 14. BN 52063 (Ginkgolides A, B & C) vs. placebo CROSSOVER

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 FEV1	1		Litres (Fixed, 95% CI)	Totals not selected
2 FEV1 % predicted	1		% predicted (Fixed, 95% CI)	Totals not selected

Comparison 15. AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 FEV1	1		Litres (Fixed, 95% CI)	Totals not selected
2 PEF	1		Litres/min (Fixed, 95% CI)	Totals not selected
3 Asthma Control Questionnaire (ACQ)	1		ACQ score (Fixed, 95% CI)	Totals not selected
4 Asthma Quality of Life Questionnaire (AQLQ)	1		AQLQ score (Fixed, 95% CI)	Totals not selected
5 Leicester Cough Questionnaire (LCQ)	1		LCQ score (Fixed, 95% CI)	Totals not selected
6 AQL (No. improved on treatment)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
7 AQLQ (No. improved on treatment)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

Comparison 16. Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 No. patients with subjective improvement (assessed by allergists)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
2 No. patients with subjective improvement (assessed by Chinese doctors)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
3 No. patients with subjective improvement (assessed by parents)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
4 Change in symptom score	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5 Change in medication score	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
6 Change in early morning PEFR (L/min)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

7 Change in evening PEFR (L/min)	1	Mean Difference (IV, Fixed, 95% CI)	Totals not selected

Comparison 17. Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 No. patients with subjective improvement (assessed by allergists)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
2 No. patients with subjective improvement (assessed by Chinese doctors)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
3 No. patients with subjective improvement (assessed by parents)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
4 Change in symptom score	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5 Change in medication score	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
6 Change in early morning PEFR (L/min)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
7 Change in evening PEFR (L/min)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

Comparison 18. Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 No. patients with subjective improvement (assessed by allergists)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
2 No. patients with subjective improvement (assessed by Chinese doctors)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
3 No. patients with subjective improvement (assessed by parents)	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
4 Change in symptom score	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5 Change in medication score	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
6 Change in early morning PEFR (L/min)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
7 Change in evening PEFR (L/min)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

Comparison 19. Din Chuan Tang (DCT) versus placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 FEV1 predicted %	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2 FVC predicted %	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
3 Rescue-free days (%)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
4 Days of asthma attacks (%)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5 Mean asthma attacks	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
6 Mean days when oral steroids required	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
7 Mean days when bronchodialtor required	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
8 Patients reducing ICS	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

Comparison 20. Ginger versus placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 No. patients experiencing dyspnea after treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
2 No. patients experiencing wheeze after treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
3 No. patients experiencing chest tightness after treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

Comparison 21. Indian herbal compound versus placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 FEV1	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2 Symptom score	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
3 Headache	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
4 Nausea	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

Analysis 1.1. Comparison 1 Boswellia extract vs. placebo, Outcome 1 Mean attacks / week.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 1 Boswellia extract vs. placebo

Outcome: 1 Mean attacks / week

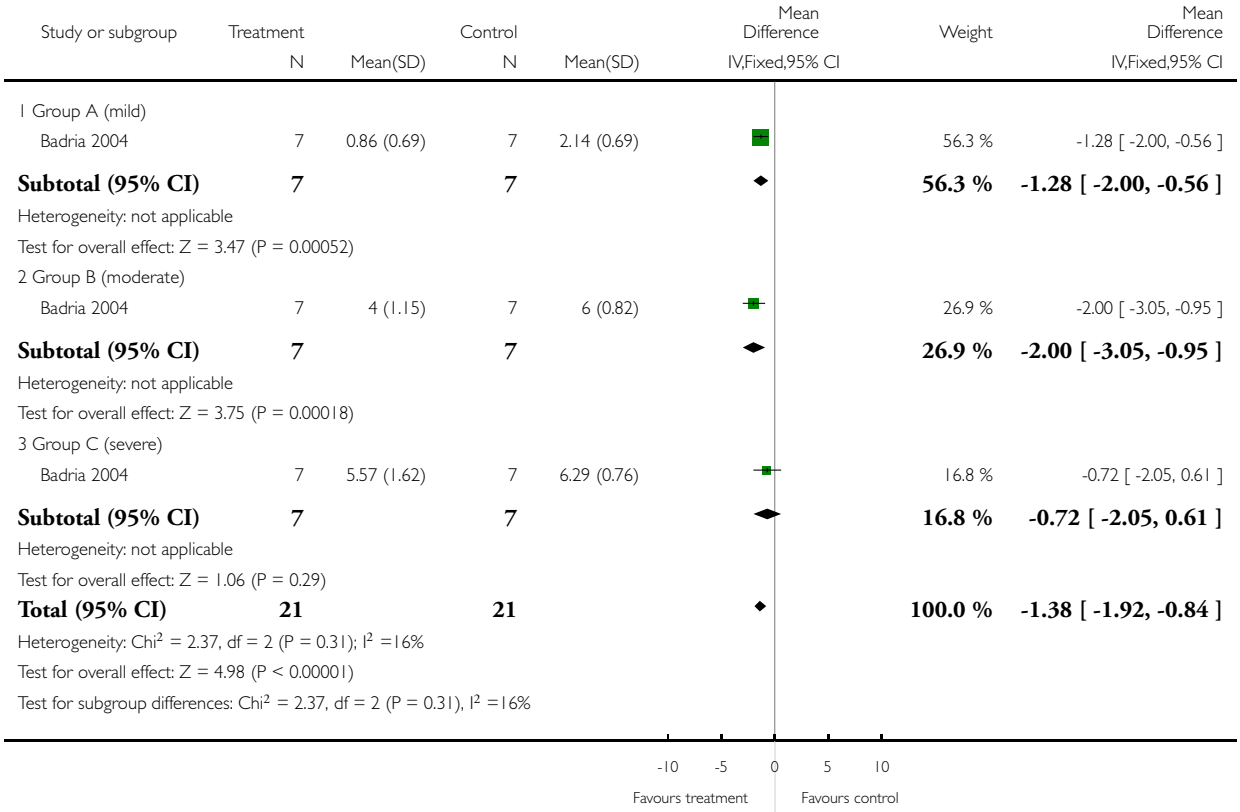
Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Weight	Mean Difference IV,Fixed,95% CI
1 Group A (mild)							
Badria 2004	7	2.86 (1.6)	7	3.43 (1)		70.2 %	-0.57 [-1.97, 0.83]
Subtotal (95% CI)	**7**		**7**			**70.2 %**	**-0.57 [-1.97, 0.83]**
Heterogeneity: not applicable							
Test for overall effect: Z = 0.80 (P = 0.42)							
2 Group B (moderate)							
Badria 2004	7	9.29 (1.98)	7	13.43 (2.44)		25.3 %	-4.14 [-6.47, -1.81]
Subtotal (95% CI)	**7**		**7**			**25.3 %**	**-4.14 [-6.47, -1.81]**
Heterogeneity: not applicable							
Test for overall effect: Z = 3.49 (P = 0.00049)							
3 Group C (severe)							
Badria 2004	7	15.3 (7.2)	7	22.4 (2.1)		4.4 %	-7.10 [-12.66, -1.54]
Subtotal (95% CI)	**7**		**7**			**4.4 %**	**-7.10 [-12.66, -1.54]**
Heterogeneity: not applicable							
Test for overall effect: Z = 2.50 (P = 0.012)							
Total (95% CI)	**21**		**21**			**100.0 %**	**-1.76 [-2.94, -0.59]**
Heterogeneity: Chi² = 10.35, df = 2 (P = 0.01); I² =81%							
Test for overall effect: Z = 2.95 (P = 0.0032)							
Test for subgroup differences: Chi² = 10.35, df = 2 (P = 0.01), I² =81%							

Analysis 1.2. Comparison 1 Boswellia extract vs. placebo, Outcome 2 Mean night attacks / week.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 1 Boswellia extract vs. placebo

Outcome: 2 Mean night attacks / week



Analysis 1.3. Comparison 1 Boswellia extract vs. placebo, Outcome 3 Mean FVC.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 1 Boswellia extract vs. placebo

Outcome: 3 Mean FVC

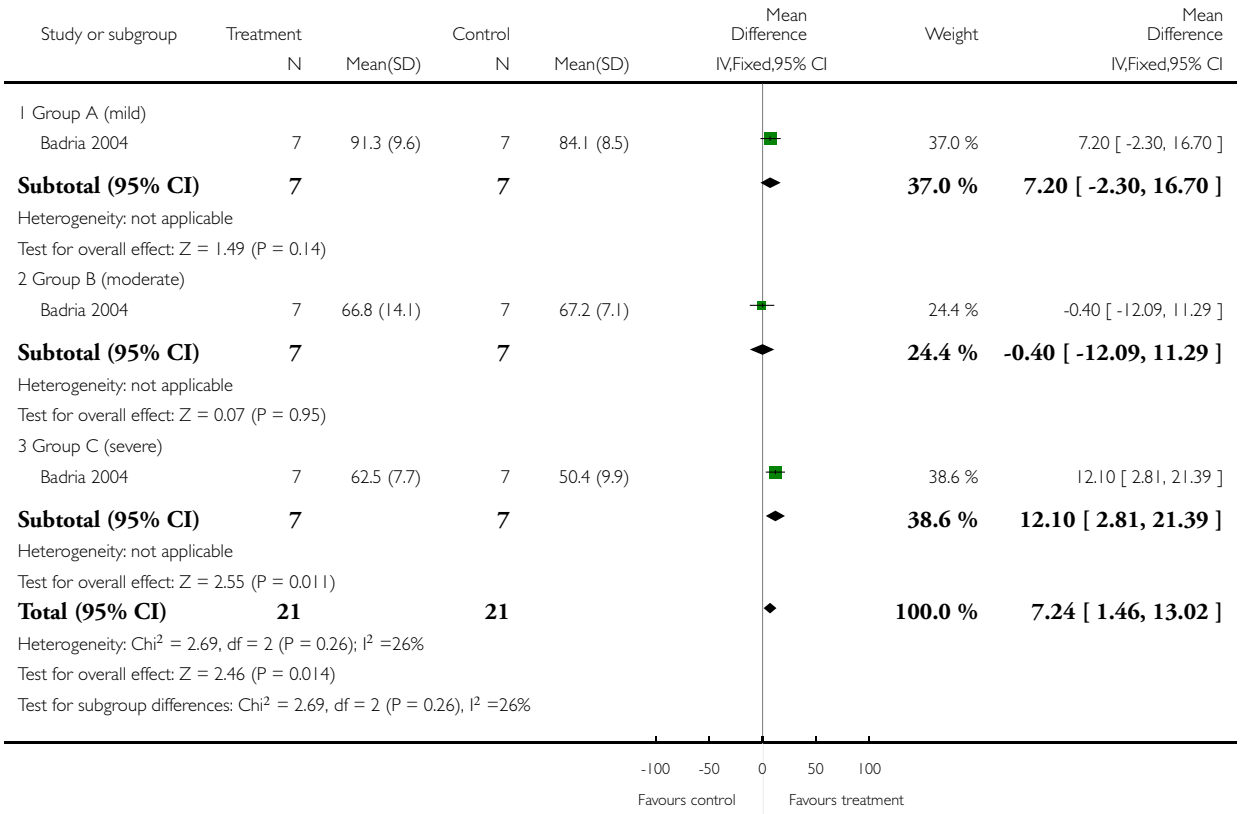
Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Weight	Mean Difference IV,Fixed,95% CI
1 Group A (mild)							
Badria 2004	7	84.7 (15.5)	7	79.4 (12.9)		17.6 %	5.30 [-9.64, 20.24]
Subtotal (95% CI)	**7**		**7**			**17.6 %**	**5.30 [-9.64, 20.24]**
Heterogeneity: not applicable							
Test for overall effect: Z = 0.70 (P = 0.49)							
2 Group B (moderate)							
Badria 2004	7	68.4 (9.9)	7	66.7 (10.1)		35.8 %	1.70 [-8.78, 12.18]
Subtotal (95% CI)	**7**		**7**			**35.8 %**	**1.70 [-8.78, 12.18]**
Heterogeneity: not applicable							
Test for overall effect: Z = 0.32 (P = 0.75)							
3 Group C (severe)							
Badria 2004	7	57.4 (9.7)	7	48 (7.7)		46.6 %	9.40 [0.23, 18.57]
Subtotal (95% CI)	**7**		**7**			**46.6 %**	**9.40 [0.23, 18.57]**
Heterogeneity: not applicable							
Test for overall effect: Z = 2.01 (P = 0.045)							
Total (95% CI)	**21**		**21**			**100.0 %**	**5.92 [-0.34, 12.19]**
Heterogeneity: Chi^2 = 1.18, df = 2 (P = 0.55); I^2 =0.0%							
Test for overall effect: Z = 1.85 (P = 0.064)							
Test for subgroup differences: Chi^2 = 1.18, df = 2 (P = 0.55), I^2 =0.0%							

Analysis 1.4. Comparison 1 Boswellia extract vs. placebo, Outcome 4 FEV1 % predicted.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 1 Boswellia extract vs. placebo

Outcome: 4 FEV1 % predicted

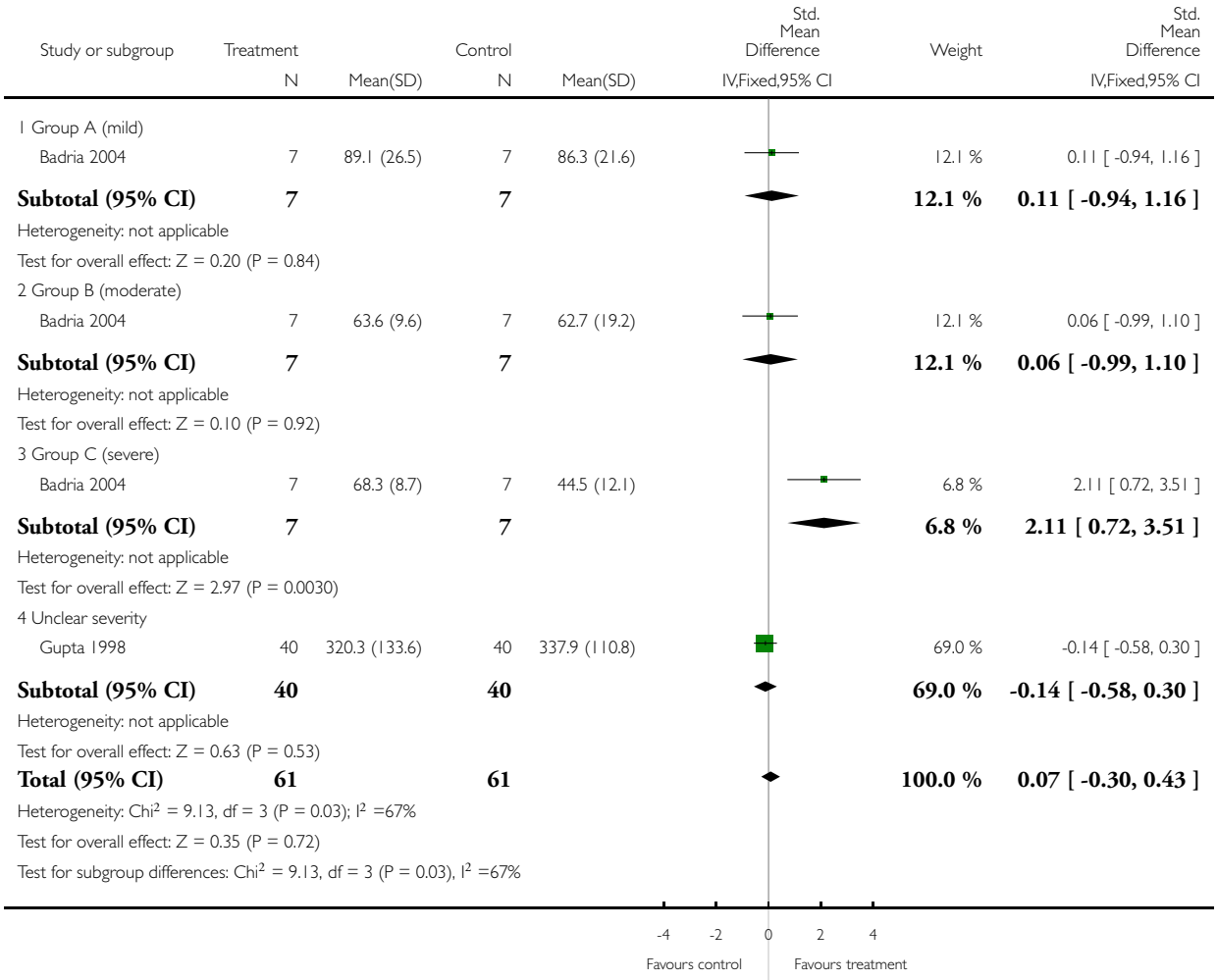


Analysis 1.5. Comparison 1 Boswellia extract vs. placebo, Outcome 5 PEF (SMD).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 1 Boswellia extract vs. placebo

Outcome: 5 PEF (SMD)



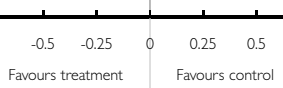
Analysis 1.6. Comparison 1 Boswellia extract vs. placebo, Outcome 6 Mean attack rate / week.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 1 Boswellia extract vs. placebo

Outcome: 6 Mean attack rate / week

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Gupta 1998	40	0.05 (0.12)	40	0.2 (0.17)		-0.15 [-0.21, -0.09]



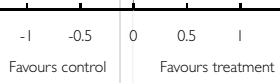
Analysis 1.7. Comparison 1 Boswellia extract vs. placebo, Outcome 7 Change in FEV1 (L).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 1 Boswellia extract vs. placebo

Outcome: 7 Change in FEV1 (L)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Gupta 1998	40	0.5 (0.5)	40	0.1 (0.2)		0.40 [0.23, 0.57]



Analysis 1.8. Comparison 1 Boswellia extract vs. placebo, Outcome 8 Change in PEF (L/min).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 1 Boswellia extract vs. placebo

Outcome: 8 Change in PEF (L/min)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Weight	Mean Difference IV,Fixed,95% CI
Gupta 1998	40	76.2 (60.3)	40	31.7 (25.3)		100.0 %	44.50 [24.24, 64.76]
Total (95% CI)	**40**		**40**			**100.0 %**	**44.50 [24.24, 64.76]**

Heterogeneity: not applicable

Test for overall effect: Z = 4.30 (P = 0.000017)

Test for subgroup differences: Not applicable

Analysis 1.9. Comparison 1 Boswellia extract vs. placebo, Outcome 9 Increase in FVC (L).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 1 Boswellia extract vs. placebo

Outcome: 9 Increase in FVC (L)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Gupta 1998	40	0.6 (0.6)	40	0.2 (0.2)		0.40 [0.20, 0.60]

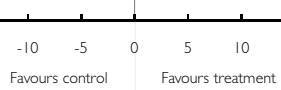
Analysis 2.1. Comparison 2 Nebulized menthol vs. placebo, Outcome 1 VC % predicted.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 2 Nebulized menthol vs. placebo

Outcome: 1 VC % predicted

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Tamaoki 1995	11	95.3 (2.98)	10	95 (3.48)		0.30 [-2.48, 3.08]



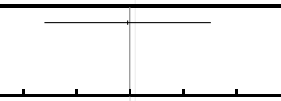
Analysis 2.2. Comparison 2 Nebulized menthol vs. placebo, Outcome 2 FEV1 % predicted.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 2 Nebulized menthol vs. placebo

Outcome: 2 FEV1 % predicted

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Tamaoki 1995	11	84.2 (9.95)	10	84.4 (8.22)		-0.20 [-7.98, 7.58]



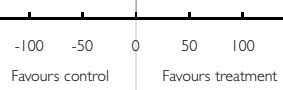
Analysis 2.3. Comparison 2 Nebulized menthol vs. placebo, Outcome 3 Change in PEFR (%).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 2 Nebulized menthol vs. placebo

Outcome: 3 Change in PEFR (%)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Tamaoki 1995	11	11.2 (10.94)	10	17 (11.38)		-5.80 [-15.37, 3.77]



Analysis 2.4. Comparison 2 Nebulized menthol vs. placebo, Outcome 4 Wheezing episodes / week.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 2 Nebulized menthol vs. placebo

Outcome: 4 Wheezing episodes / week

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Tamaoki 1995	11	1.8 (2.32)	10	2.7 (1.58)		-0.90 [-2.58, 0.78]

Analysis 2.5. Comparison 2 Nebulized menthol vs. placebo, Outcome 5 MDI inhalation puffs / week.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 2 Nebulized menthol vs. placebo

Outcome: 5 MDI inhalation puffs / week

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Tamaoki 1995	11	2.1 (0.99)	10	4.4 (0.95)		-2.30 [-3.13, -1.47]

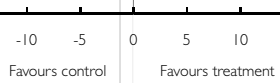
Analysis 3.1. Comparison 3 1.8-cineol (eucalyptol) vs. placebo, Outcome 1 Oral steroid reduction (mg).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 3 1.8-cineol (eucalyptol) vs. placebo

Outcome: 1 Oral steroid reduction (mg)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Juergens 2003	16	3.75 (3.27)	16	0.91 (1.86)		2.84 [1.00, 4.68]



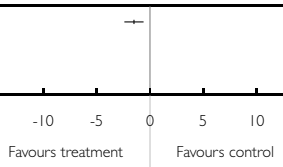
Analysis 3.2. Comparison 3 1.8-cineol (eucalyptol) vs. placebo, Outcome 2 Dyspnoea scores at 3 weeks (0=never, 5=persistent).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 3 1.8-cineol (eucalyptol) vs. placebo

Outcome: 2 Dyspnoea scores at 3 weeks (0=never, 5=persistent)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Juergens 2003	16	1.3 (1.3)	15	2.8 (1.3)		-1.50 [-2.42, -0.58]



Analysis 3.3. Comparison 3 1.8-cineol (eucalyptol) vs. placebo, Outcome 3 Patient's gloabl assessment of efficacy (1=very good, 4=deterioration).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 3 1.8-cineol (eucalyptol) vs. placebo

Outcome: 3 Patient's gloabl assessment of efficacy (1=very good, 4=deterioration)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Juergens 2003	16	0.8 (0.7)	16	1.5 (1.2)		-0.70 [-1.38, -0.02]

Analysis 3.4. Comparison 3 1.8-cineol (eucalyptol) vs. placebo, Outcome 4 Physician's global assessment of efficacy (1=very good, 4=deterioration).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 3 1.8-cineol (eucalyptol) vs. placebo

Outcome: 4 Physician's global assessment of efficacy (1=very good, 4=deterioration)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Juergens 2003	16	2.2 (1.2)	16	3.7 (0.7)		-1.50 [-2.18, -0.82]

Analysis 3.5. Comparison 3 1.8-cineol (eucalyptol) vs. placebo, Outcome 5 Patients tolerating a 2.5mg reduction in steroids.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 3 1.8-cineol (eucalyptol) vs. placebo

Outcome: 5 Patients tolerating a 2.5mg reduction in steroids

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Juergens 2003	16/16	15/16		1.06 [0.90, 1.26]

Analysis 3.6. Comparison 3 1.8-cineol (eucalyptol) vs. placebo, Outcome 6 Patients tolerating a 5mg reduction in steroids.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 3 1.8-cineol (eucalyptol) vs. placebo

Outcome: 6 Patients tolerating a 5mg reduction in steroids

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Juergens 2003	12/16	4/16		3.00 [1.23, 7.34]

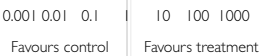
Analysis 3.7. Comparison 3 1.8-cineol (eucalyptol) vs. placebo, Outcome 7 Patients tolerating a 7.5mg reduction in steroids.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 3 1.8-cineol (eucalyptol) vs. placebo

Outcome: 7 Patients tolerating a 7.5mg reduction in steroids

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Juergens 2003	6/16	0/16		13.00 [0.79, 213.09]



Analysis 3.8. Comparison 3 1.8-cineol (eucalyptol) vs. placebo, Outcome 8 Patients tolerating a 10mg reduction in steroids.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 3 1.8-cineol (eucalyptol) vs. placebo

Outcome: 8 Patients tolerating a 10mg reduction in steroids

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Juergens 2003	4/16	0/16		9.00 [0.52, 154.56]

Analysis 3.9. Comparison 3 1.8-cineol (eucalyptol) vs. placebo, Outcome 9 FEV1 (L) at 3 weeks.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 3 1.8-cineol (eucalyptol) vs. placebo

Outcome: 9 FEV1 (L) at 3 weeks

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Juergens 2003	16	2.81 (1.4)	16	2.18 (0.89)		0.63 [-0.18, 1.44]

Analysis 3.10. Comparison 3 1.8-cineol (eucalyptol) vs. placebo, Outcome 10 PEFR at 3 weeks (l/min).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 3 1.8-cineol (eucalyptol) vs. placebo

Outcome: 10 PEFR at 3 weeks (l/min)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Juergens 2003	16	388 (186)	16	353 (107)		35.00 [-70.14, 140.14]

Analysis 3.11. Comparison 3 1.8-cineol (eucalyptol) vs. placebo, Outcome 11 Rescue salbutamol (puffs/day) at 3 weeks.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 3 1.8-cineol (eucalyptol) vs. placebo

Outcome: 11 Rescue salbutamol (puffs/day) at 3 weeks

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Juergens 2003	16	2.6 (3.1)	16	3.7 (3.2)		-1.10 [-3.28, 1.08]

Analysis 4.1. Comparison 4 Pulmoflex vs. placebo, Outcome 1 Patients experiencing deterioration.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 4 Pulmoflex vs. placebo

Outcome: 1 Patients experiencing deterioration

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Gabrielian 2004	2/21	4/9		0.21 [0.05, 0.97]

Analysis 5.1. Comparison 5 Mai-Men-Dong-Tang vs. placebo, Outcome 1 FEV1 (%).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 5 Mai-Men-Dong-Tang vs. placebo

Outcome: 1 FEV1 (%)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Weight	Mean Difference IV,Fixed,95% CI
1 MMDT 800mg vs. placebo							
Hsu 2005	40	87.7 (79.69)	20	70.2 (86.65)		49.8 %	17.50 [-27.80, 62.80]
Subtotal (95% CI)	**40**		**20**			**49.8 %**	**17.50 [-27.80, 62.80]**
Heterogeneity: not applicable							
Test for overall effect: Z = 0.76 (P = 0.45)							
2 MMDT 400mg vs. placebo							
Hsu 2005	40	73.8 (78.42)	20	70.2 (86.65)		50.2 %	3.60 [-41.49, 48.69]
Subtotal (95% CI)	**40**		**20**			**50.2 %**	**3.60 [-41.49, 48.69]**
Heterogeneity: not applicable							
Test for overall effect: Z = 0.16 (P = 0.88)							
Total (95% CI)	**80**		**40**			**100.0 %**	**10.52 [-21.44, 42.47]**
Heterogeneity: Chi^2 = 0.18, df = 1 (P = 0.67); I^2 =0.0%							
Test for overall effect: Z = 0.65 (P = 0.52)							
Test for subgroup differences: Chi^2 = 0.18, df = 1 (P = 0.67), I^2 =0.0%							

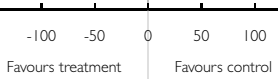
Analysis 5.2. Comparison 5 Mai-Men-Dong-Tang vs. placebo, Outcome 2 Symptom scores.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 5 Mai-Men-Dong-Tang vs. placebo

Outcome: 2 Symptom scores

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Weight	Mean Difference IV,Fixed,95% CI
1 MMDT 800mg vs. placebo							
Hsu 2005	40	10.8 (14.9)	20	12.6 (14.8)		58.0 %	-1.80 [-9.76, 6.16]
Subtotal (95% CI)	**40**		**20**			**58.0 %**	**-1.80 [-9.76, 6.16]**
Heterogeneity: not applicable							
Test for overall effect: Z = 0.44 (P = 0.66)							
2 MMDT 400mg vs. placebo							
Hsu 2005	40	15.6 (21.8)	20	12.6 (14.8)		42.0 %	3.00 [-6.37, 12.37]
Subtotal (95% CI)	**40**		**20**			**42.0 %**	**3.00 [-6.37, 12.37]**
Heterogeneity: not applicable							
Test for overall effect: Z = 0.63 (P = 0.53)							
Total (95% CI)	**80**		**40**			**100.0 %**	**0.21 [-5.85, 6.28]**
Heterogeneity: Chi^2 = 0.59, df = 1 (P = 0.44); I^2 =0.0%							
Test for overall effect: Z = 0.07 (P = 0.94)							
Test for subgroup differences: Chi^2 = 0.59, df = 1 (P = 0.44), I^2 =0.0%							



Analysis 5.3. Comparison 5 Mai-Men-Dong-Tang vs. placebo, Outcome 3 Patients experiencing at least a 5% improvement in FEV1 at 4 months.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 5 Mai-Men-Dong-Tang vs. placebo

Outcome: 3 Patients experiencing at least a 5% improvement in FEV1 at 4 months

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
1 MMDT 800mg vs. placebo					
Hsu 2005	18/40	1/20		50.0 %	9.00 [1.29, 62.68]
Subtotal (95% CI)	**40**	**20**		**50.0 %**	**9.00 [1.29, 62.68]**
Total events: 18 (Treatment), 1 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 2.22 (P = 0.026)					
2 MMDT 400mg vs. placebo					
Hsu 2005	14/40	1/20		50.0 %	7.00 [0.99, 49.52]
Subtotal (95% CI)	**40**	**20**		**50.0 %**	**7.00 [0.99, 49.52]**
Total events: 14 (Treatment), 1 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 1.95 (P = 0.051)					
Total (95% CI)	**80**	**40**		**100.0 %**	**8.00 [2.02, 31.71]**
Total events: 32 (Treatment), 2 (Control)					
Heterogeneity: Chi² = 0.03, df = 1 (P = 0.86); I² =0.0%					
Test for overall effect: Z = 2.96 (P = 0.0031)					

Analysis 6.1. Comparison 6 Propolis vs. placebo, Outcome 1 Number of nocturnal attacks.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 6 Propolis vs. placebo

Outcome: 1 Number of nocturnal attacks

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Khayyal 2003	22	0.89 (0.96)	24	2.28 (1.08)		-1.39 [-1.98, -0.80]

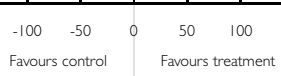
Analysis 6.2. Comparison 6 Propolis vs. placebo, Outcome 2 FVC % predicted.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 6 Propolis vs. placebo

Outcome: 2 FVC % predicted

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Khayyal 2003	22	82 (14.07)	24	75 (12.25)		7.00 [-0.65, 14.65]



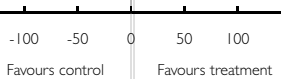
Analysis 6.3. Comparison 6 Propolis vs. placebo, Outcome 3 FEV1 % predicted.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 6 Propolis vs. placebo

Outcome: 3 FEV1 % predicted

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Khayyal 2003	22	73.5 (18.76)	24	57 (14.7)		16.50 [6.70, 26.30]



Analysis 6.4. Comparison 6 Propolis vs. placebo, Outcome 4 PEFR % predicted.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 6 Propolis vs. placebo

Outcome: 4 PEFR % predicted

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Khayyal 2003	22	71 (14.07)	24	58 (14.7)		13.00 [4.68, 21.32]

Analysis 6.5. Comparison 6 Propolis vs. placebo, Outcome 5 FEF25-75 % predicted.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 6 Propolis vs. placebo

Outcome: 5 FEF25-75 % predicted

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Khayyal 2003	22	61.5 (24.63)	24	48 (17.15)		13.50 [1.13, 25.87]

Analysis 7.1. Comparison 7 Tylophora indica vs. placebo, Outcome 1 Symptom score improvement>50% (week 1).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

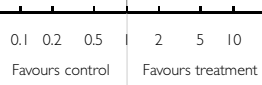
Outcome: 1 Symptom score improvement>50% (week 1)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
Gupta 1979	18/71	11/64		44.6 %	1.48 [0.76, 2.88]
Mathew 1974	34/59	15/64		55.4 %	2.46 [1.50, 4.03]
Total (95% CI)	**130**	**128**		**100.0 %**	**2.02 [1.36, 3.00]**

Total events: 52 (Treatment), 26 (Control)

Heterogeneity: Chi^2 = 1.45, df = 1 (P = 0.23); I^2 =31%

Test for overall effect: Z = 3.49 (P = 0.00049)



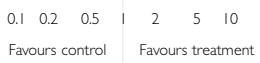
Analysis 7.2. Comparison 7 Tylophora indica vs. placebo, Outcome 2 Drug consumption scores improvement >50% (week 1).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 2 Drug consumption scores improvement >50% (week 1)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Mathew 1974	36/59	15/64		2.60 [1.60, 4.24]

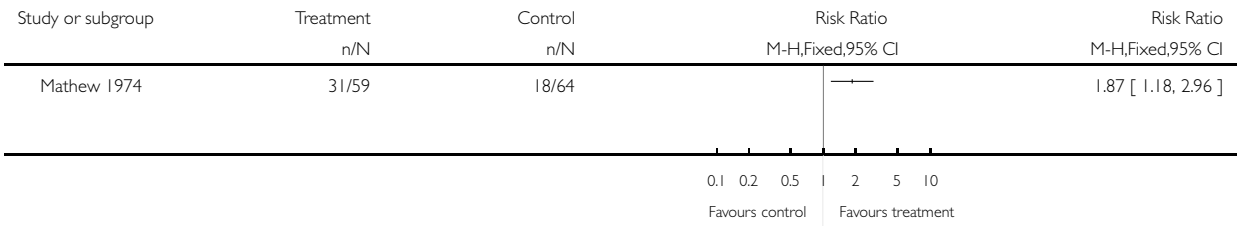


Analysis 7.3. Comparison 7 Tylophora indica vs. placebo, Outcome 3 Physical sign scores improvement >50% (week 1).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 3 Physical sign scores improvement >50% (week 1)

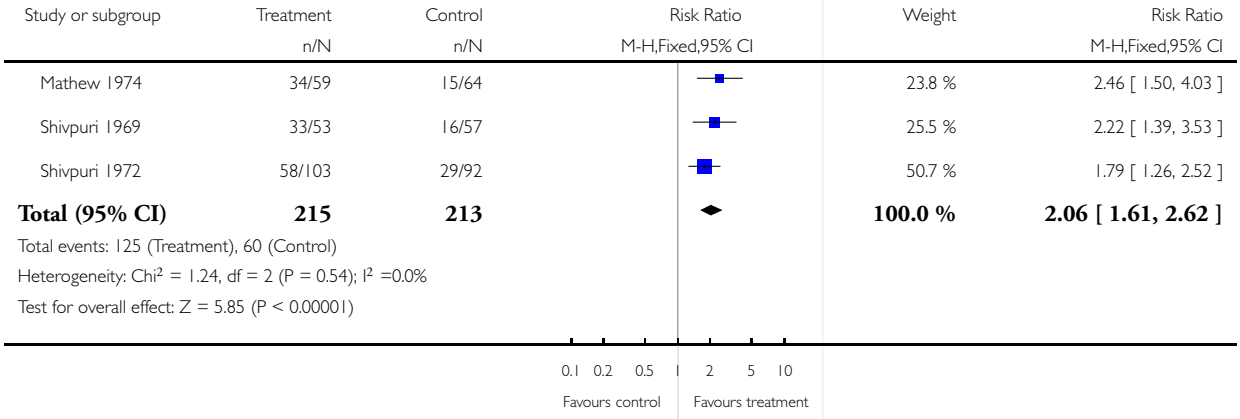


Analysis 7.4. Comparison 7 Tylophora indica vs. placebo, Outcome 4 Total clinical improvement >50% (week 1).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 4 Total clinical improvement >50% (week 1)



Analysis 7.5. Comparison 7 Tylophora indica vs. placebo, Outcome 5 No. pts showing >15% increase in FEV1 (week 1).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

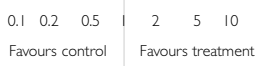
Outcome: 5 No. pts showing >15% increase in FEV1 (week 1)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
Gupta 1979	39/71	37/64		81.5 %	0.95 [0.71, 1.28]
Mathew 1974	19/56	9/58		18.5 %	2.19 [1.08, 4.42]
Total (95% CI)	**127**	**122**		**100.0 %**	**1.18 [0.89, 1.56]**

Total events: 58 (Treatment), 46 (Control)

Heterogeneity: Chi^2 = 4.99, df = 1 (P = 0.03); I^2 =80%

Test for overall effect: Z = 1.15 (P = 0.25)



Analysis 7.6. Comparison 7 Tylophora indica vs. placebo, Outcome 6 No patients showing >20% increase in PEFR (week 1).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

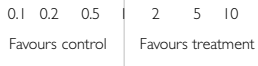
Outcome: 6 No patients showing >20% increase in PEFR (week 1)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
Gupta 1979	40/71	39/64		76.3 %	0.92 [0.70, 1.23]
Mathew 1974	36/56	13/58		23.7 %	2.87 [1.71, 4.81]
Total (95% CI)	**127**	**122**		**100.0 %**	**1.39 [1.08, 1.78]**

Total events: 76 (Treatment), 52 (Control)

Heterogeneity: Chi^2 = 15.43, df = 1 (P = 0.00009); I^2 =94%

Test for overall effect: Z = 2.56 (P = 0.010)



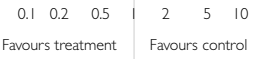
Analysis 7.7. Comparison 7 Tylophora indica vs. placebo, Outcome 7 No. pts experiencing side effects (week 1).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 7 No. pts experiencing side effects (week 1)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
Mathew 1974	11/59	3/64		20.5 %	3.98 [1.17, 13.56]
Shivpuri 1969	28/53	5/57		34.3 %	6.02 [2.51, 14.45]
Shivpuri 1972	17/103	6/92		45.2 %	2.53 [1.04, 6.15]
Total (95% CI)	**215**	**213**		**100.0 %**	**4.03 [2.33, 6.95]**
Total events: 56 (Treatment), 14 (Control)					
Heterogeneity: Chi^2 = 1.87, df = 2 (P = 0.39); I^2 =0.0%					
Test for overall effect: Z = 5.00 (P < 0.00001)					



Analysis 7.8. Comparison 7 Tylophora indica vs. placebo, Outcome 8 Symptom score improvement>50% (week 12).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 8 Symptom score improvement>50% (week 12)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Mathew 1974	16/59	8/64		2.17 [1.00, 4.69]

Analysis 7.9. Comparison 7 Tylophora indica vs. placebo, Outcome 9 Drug consumption scores improvement >50% (week 12).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 9 Drug consumption scores improvement >50% (week 12)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Mathew 1974	19/59	9/64		2.29 [1.13, 4.66]

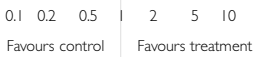
Analysis 7.10. Comparison 7 Tylophora indica vs. placebo, Outcome 10 Physical sign scores improvement >50% (week 12).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 10 Physical sign scores improvement >50% (week 12)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Mathew 1974	19/59	8/64		2.58 [1.22, 5.43]

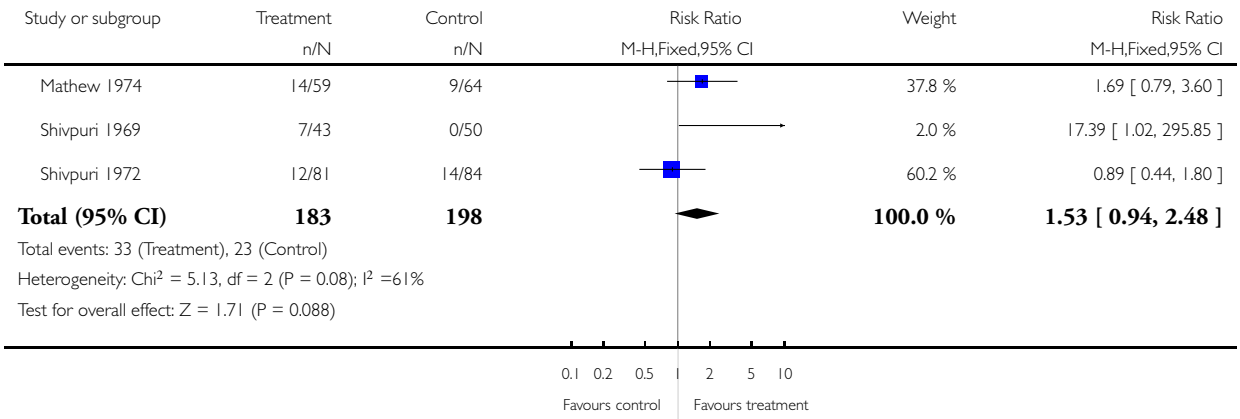


Analysis 7.11. Comparison 7 Tylophora indica vs. placebo, Outcome 11 Total clinical improvement >50% (week 12).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 11 Total clinical improvement >50% (week 12)

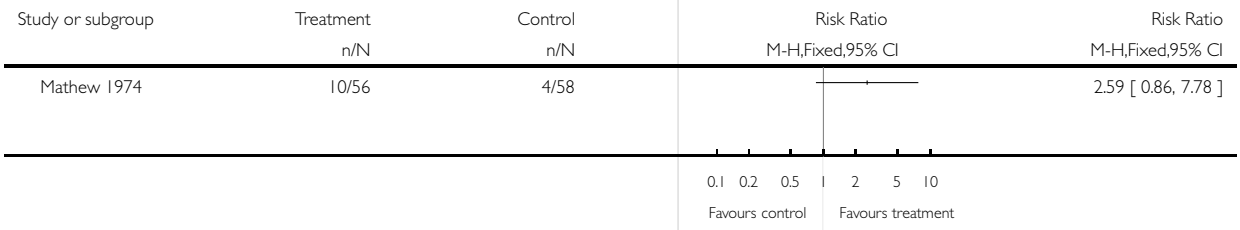


Analysis 7.12. Comparison 7 Tylophora indica vs. placebo, Outcome 12 No. pts showing >15% increase in FEV1 (week 12).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 12 No. pts showing >15% increase in FEV1 (week 12)



Analysis 7.13. Comparison 7 Tylophora indica vs. placebo, Outcome 13 No patients showing >20% increase in PEFR (week 12).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 13 No patients showing >20% increase in PEFR (week 12)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Mathew 1974	16/56	7/58		2.37 [1.05, 5.31]

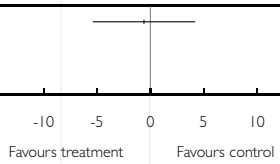
Analysis 7.14. Comparison 7 Tylophora indica vs. placebo, Outcome 14 Symptom scores (end of treatment).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 14 Symptom scores (end of treatment)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Gupta 1979	65	12.74 (15.32)	60	13.33 (12.18)		-0.59 [-5.42, 4.24]



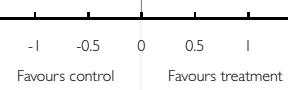
Analysis 7.15. Comparison 7 Tylophora indica vs. placebo, Outcome 15 FEV1 (L) (end of treatment).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 15 FEV1 (L) (end of treatment)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Gupta 1979	65	1.12 (0.55)	60	1.12 (0.52)		0.0 [-0.19, 0.19]



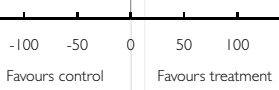
Analysis 7.16. Comparison 7 Tylophora indica vs. placebo, Outcome 16 PEFR (L/min) (end of treatment).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 16 PEFR (L/min) (end of treatment)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Gupta 1979	65	154.79 (90.73)	60	148.66 (72.91)		6.13 [-22.62, 34.88]



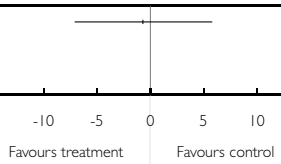
Analysis 7.17. Comparison 7 Tylophora indica vs. placebo, Outcome 17 Symptom scores (two week follow-up).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 17 Symptom scores (two week follow-up)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Gupta 1979	65	15.99 (18.45)	60	16.65 (18.21)		-0.66 [-7.09, 5.77]



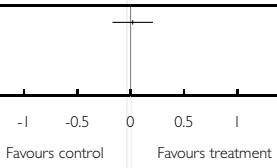
Analysis 7.18. Comparison 7 Tylophora indica vs. placebo, Outcome 18 FEV1 (L) (two week follow-up).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 18 FEV1 (L) (two week follow-up)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Gupta 1979	65	1.13 (0.52)	60	1.11 (0.55)		0.02 [-0.17, 0.21]



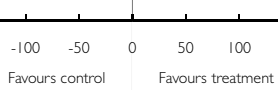
Analysis 7.19. Comparison 7 Tylophora indica vs. placebo, Outcome 19 PEFR (L/min) (two week follow-up).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 19 PEFR (L/min) (two week follow-up)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Gupta 1979	65	154 (81.33)	60	145.02 (79.26)		8.98 [-19.18, 37.14]



Analysis 7.20. Comparison 7 Tylophora indica vs. placebo, Outcome 20 Symptom score improvement>50% (two week follow-up).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 20 Symptom score improvement>50% (two week follow-up)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Gupta 1979	39/71	31/64		1.13 [0.82, 1.58]

Analysis 7.21. Comparison 7 Tylophora indica vs. placebo, Outcome 21 No. pts showing >15% increase in FEV1 (two week follow-up).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 21 No. pts showing >15% increase in FEV1 (two week follow-up)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Gupta 1979	39/71	31/64		1.13 [0.82, 1.58]

Analysis 7.22. Comparison 7 Tylophora indica vs. placebo, Outcome 22 No patients showing >20% increase in PEFR (two week follow-up).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 22 No patients showing >20% increase in PEFR (two week follow-up)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Gupta 1979	38/71	34/64		1.01 [0.73, 1.38]

Analysis 7.23. Comparison 7 Tylophora indica vs. placebo, Outcome 23 Wheezing attacks (mean score at end of week 1) CROSSOVER.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 23 Wheezing attacks (mean score at end of week 1) CROSSOVER

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Thiruvengadam 1978	8	1.25 (0)	7	1.43 (0)		0.0 [0.0, 0.0]

Analysis 7.24. Comparison 7 Tylophora indica vs. placebo, Outcome 24 Nocturnal dyspnoea (mean score at end of 1st week) CROSSOVER.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 24 Nocturnal dyspnoea (mean score at end of 1st week) CROSSOVER

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Thiruvengadam 1978	8	1.25 (0)	7	1.86 (0)		0.0 [0.0, 0.0]

Analysis 7.25. Comparison 7 Tylophora indica vs. placebo, Outcome 25 Mean breathing capacity (MBC) mean daily change (L/min) CROSSOVER.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 25 Mean breathing capacity (MBC) mean daily change (L/min) CROSSOVER

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Thiruvengadam 1978	8	3.1 (0)	7	-1.15 (0)		0.0 [0.0, 0.0]

Analysis 7.26. Comparison 7 Tylophora indica vs. placebo, Outcome 26 VC mean daily change (L) CROSSOVER.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 26 VC mean daily change (L) CROSSOVER

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Thiruvengadam 1978	8	0.11 (0)	7	-0.06 (0)		0.0 [0.0, 0.0]

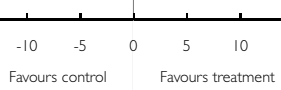
Analysis 7.27. Comparison 7 Tylophora indica vs. placebo, Outcome 27 PEF mean daily change (L/min) CROSSOVER.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 7 Tylophora indica vs. placebo

Outcome: 27 PEF mean daily change (L/min) CROSSOVER

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Thiruvengadam 1978	8	14.01 (0)	7	-7.15 (0)		0.0 [0.0, 0.0]



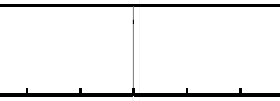
Analysis 8.1. Comparison 8 Ivy leaf extract vs. placebo CROSSOVER, Outcome 1 Vital capacity (L).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 8 Ivy leaf extract vs. placebo CROSSOVER

Outcome: 1 Vital capacity (L)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Mansfeld 1998	24	2.06 (0)	24	1.99 (0)		0.0 [0.0, 0.0]



Analysis 8.2. Comparison 8 Ivy leaf extract vs. placebo CROSSOVER, Outcome 2 Vital capacity (% change from baseline).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 8 Ivy leaf extract vs. placebo CROSSOVER

Outcome: 2 Vital capacity (% change from baseline)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Mansfeld 1998	24	6.5 (0)	24	2.8 (0)		0.0 [0.0, 0.0]

Analysis 8.3. Comparison 8 Ivy leaf extract vs. placebo CROSSOVER, Outcome 3 FVC (L).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 8 Ivy leaf extract vs. placebo CROSSOVER

Outcome: 3 FVC (L)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Mansfeld 1998	24	1.97 (0)	24	1.9 (0)		0.0 [0.0, 0.0]

Analysis 8.4. Comparison 8 Ivy leaf extract vs. placebo CROSSOVER, Outcome 4 FVC (% change from baseline).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 8 Ivy leaf extract vs. placebo CROSSOVER

Outcome: 4 FVC (% change from baseline)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Mansfeld 1998	24	8.4 (0)	24	3.3 (0)		0.0 [0.0, 0.0]

Analysis 8.5. Comparison 8 Ivy leaf extract vs. placebo CROSSOVER, Outcome 5 FEV1 (L).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 8 Ivy leaf extract vs. placebo CROSSOVER

Outcome: 5 FEV1 (L)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Mansfeld 1998	24	1.8 (0)	24	1.67 (0)		0.0 [0.0, 0.0]

Analysis 8.6. Comparison 8 Ivy leaf extract vs. placebo CROSSOVER, Outcome 6 FEV1 (% change from baseline).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 8 Ivy leaf extract vs. placebo CROSSOVER

Outcome: 6 FEV1 (% change from baseline)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Mansfeld 1998	24	11.8 (0)	24	5 (0)		0.0 [0.0, 0.0]

Analysis 9.1. Comparison 9 Evening primrose oil vs. placebo CROSSOVER, Outcome 1 Mean morning PEF.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 9 Evening primrose oil vs. placebo CROSSOVER

Outcome: 1 Mean morning PEF

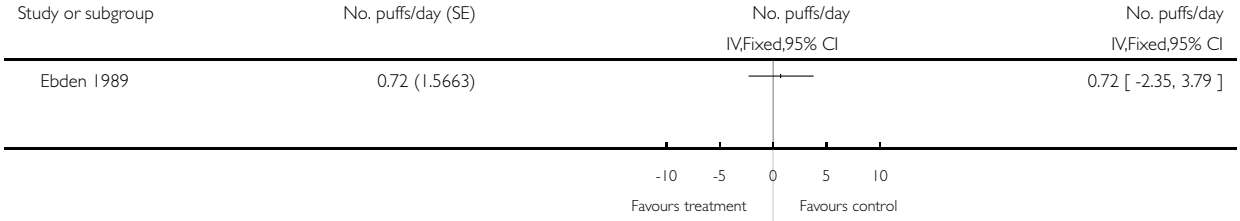
Study or subgroup	Litres/min (SE)	Litres/min IV,Fixed,95% CI	Litres/min IV,Fixed,95% CI
Ebden 1989	1.74 (46.9234)		1.74 [-90.23, 93.71]

Analysis 9.2. Comparison 9 Evening primrose oil vs. placebo CROSSOVER, Outcome 2 Use of bronchodilator.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 9 Evening primrose oil vs. placebo CROSSOVER

Outcome: 2 Use of bronchodilator

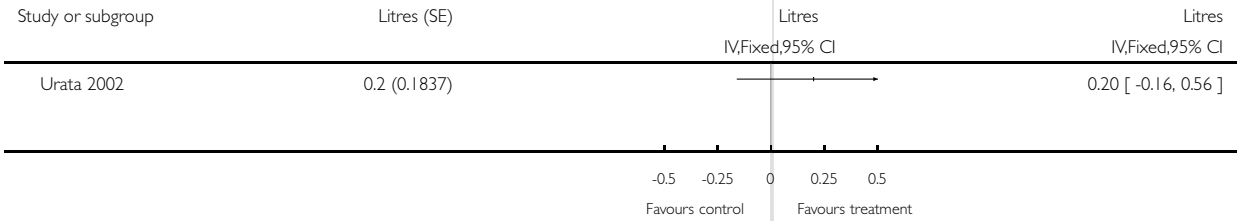


Analysis 10.1. Comparison 10 Tj-96 ("Saiboku-to") vs. placebo CROSSOVER, Outcome 1 FEV1.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 10 Tj-96 ("Saiboku-to") vs. placebo CROSSOVER

Outcome: 1 FEV1

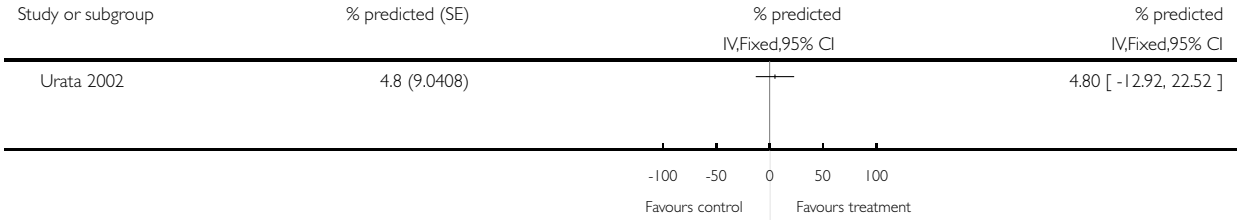


Analysis 10.2. Comparison 10 Tj-96 ("Saiboku-to") vs. placebo CROSSOVER, Outcome 2 FEV1 % predicted.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 10 Tj-96 ("Saiboku-to") vs. placebo CROSSOVER

Outcome: 2 FEV1 % predicted

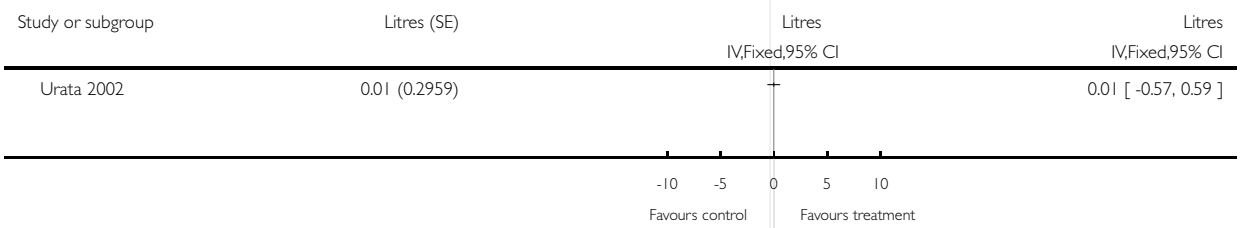


Analysis 10.3. Comparison 10 Tj-96 ("Saiboku-to") vs. placebo CROSSOVER, Outcome 3 FVC.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 10 Tj-96 ("Saiboku-to") vs. placebo CROSSOVER

Outcome: 3 FVC

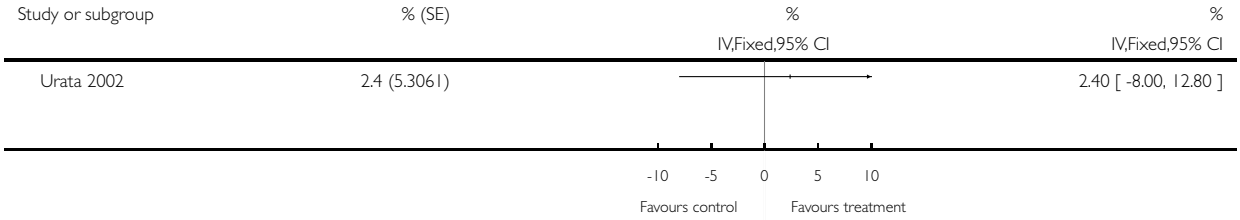


Analysis 10.4. Comparison 10 Tj-96 ("Saiboku-to") vs. placebo CROSSOVER, Outcome 4 FVC % predicted.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 10 Tj-96 ("Saiboku-to") vs. placebo CROSSOVER

Outcome: 4 FVC % predicted

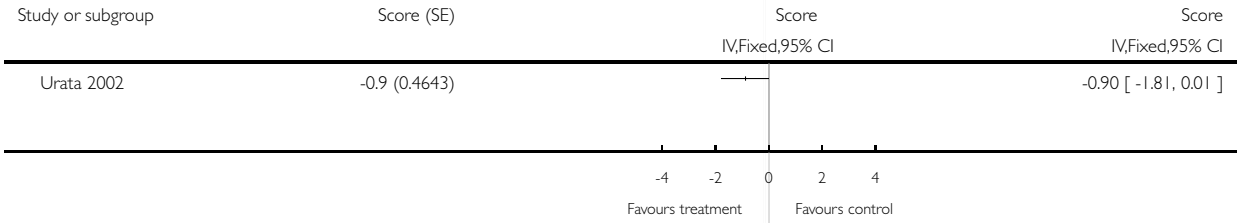


Analysis 10.5. Comparison 10 Tj-96 ("Saiboku-to") vs. placebo CROSSOVER, Outcome 5 Symptom scores (0=asymptomatic, 3=severe attack).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 10 Tj-96 ("Saiboku-to") vs. placebo CROSSOVER

Outcome: 5 Symptom scores (0=asymptomatic, 3=severe attack)

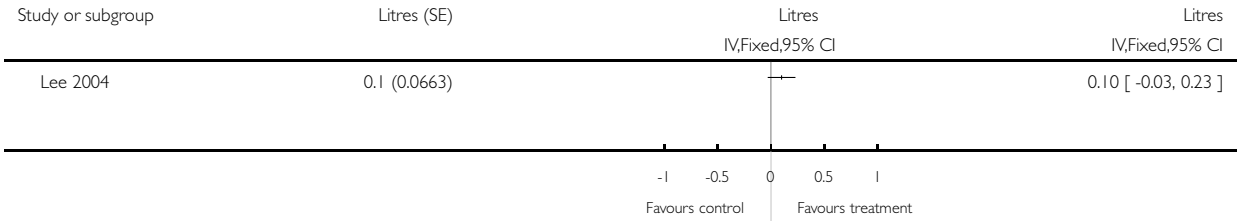


Analysis 11.1. Comparison 11 Butterbur (Petasites hybridus) vs. placebo CROSSOVER, Outcome 1 FEV1.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 11 Butterbur (Petasites hybridus) vs. placebo CROSSOVER

Outcome: 1 FEV1

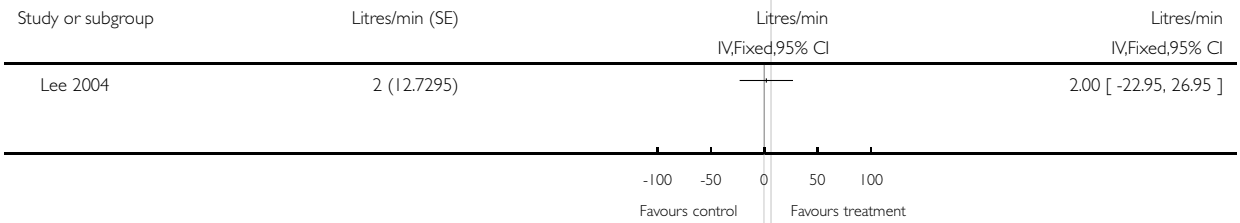


Analysis 11.2. Comparison 11 Butterbur (Petasites hybridus) vs. placebo CROSSOVER, Outcome 2 PEF.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 11 Butterbur (Petasites hybridus) vs. placebo CROSSOVER

Outcome: 2 PEF

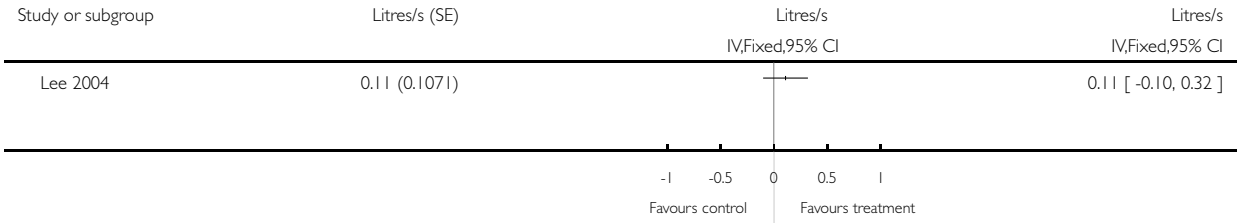


Analysis 11.3. Comparison 11 Butterbur (Petasites hybridus) vs. placebo CROSSOVER, Outcome 3 FEF 25-75.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 11 Butterbur (Petasites hybridus) vs. placebo CROSSOVER

Outcome: 3 FEF 25-75



Analysis 12.1. Comparison 12 Borage oil vs. placebo CROSSOVER, Outcome 1 FEV1 at month 12.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 12 Borage oil vs. placebo CROSSOVER

Outcome: 1 FEV1 at month 12

Analysis 13.1. Comparison 13 Pcynogenol (extract of French maritime bark) vs. placebo, Outcome 1 PEF (% predicted).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 13 Pcynogenol (extract of French maritime bark) vs. placebo

Outcome: 1 PEF (% predicted)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Lau 2004	30	87.11 (10.79)	30	69.26 (8.65)		17.85 [12.90, 22.80]

Analysis 13.2. Comparison 13 Pcynogenol (extract of French maritime bark) vs. placebo, Outcome 2 Albuterol puffs/24 hr.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 13 Pcynogenol (extract of French maritime bark) vs. placebo

Outcome: 2 Albuterol puffs/24 hr

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Lau 2004	30	0.22 (0.38)	30	2.32 (1.15)		-2.10 [-2.53, -1.67]

Analysis 13.3. Comparison 13 Pcynogenol (extract of French maritime bark) vs. placebo, Outcome 3 Symptom scores per day (0=no symptoms, 4=very severe).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 13 Pcynogenol (extract of French maritime bark) vs. placebo

Outcome: 3 Symptom scores per day (0=no symptoms, 4=very severe)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Fixed,95% CI	Std. Mean Difference IV,Fixed,95% CI
Lau 2004	30	0.27 (0.33)	30	2.18 (0.61)		-3.84 [-4.72, -2.97]

Analysis 13.4. Comparison 13 Pcynogenol (extract of French maritime bark) vs. placebo, Outcome 4 No. subjects with decreased symptoms at 3 months.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 13 Pcynogenol (extract of French maritime bark) vs. placebo

Outcome: 4 No. subjects with decreased symptoms at 3 months

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Lau 2004	30/30	16/30		1.85 [1.32, 2.58]

Analysis 13.5. Comparison 13 Pcynogenol (extract of French maritime bark) vs. placebo, Outcome 5 No. subjects off inhaler at 3 months.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 13 Pcynogenol (extract of French maritime bark) vs. placebo

Outcome: 5 No. subjects off inhaler at 3 months

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Lau 2004	18/30	3/30		6.00 [1.97, 18.25]

Analysis 13.6. Comparison 13 Pcynogenol (extract of French maritime bark) vs. placebo, Outcome 6 No. subjects with oral medication at 3 months.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 13 Pcynogenol (extract of French maritime bark) vs. placebo

Outcome: 6 No. subjects with oral medication at 3 months

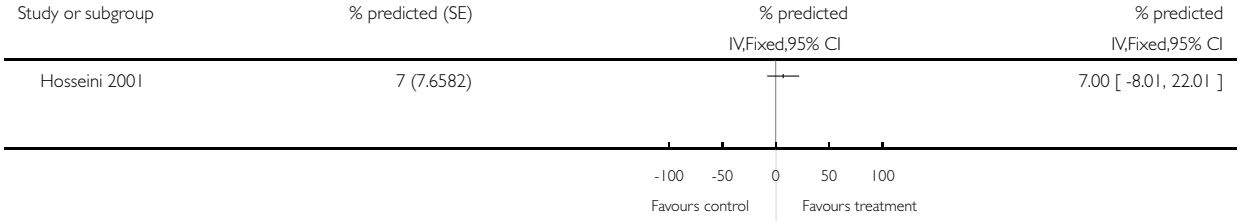
Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Lau 2004	4/30	4/30		1.00 [0.28, 3.63]

Analysis 13.7. Comparison 13 Pcynogenol (extract of French maritime bark) vs. placebo, Outcome 7 Mean FEV1 CROSSOVER.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 13 Pcynogenol (extract of French maritime bark) vs. placebo

Outcome: 7 Mean FEV1 CROSSOVER

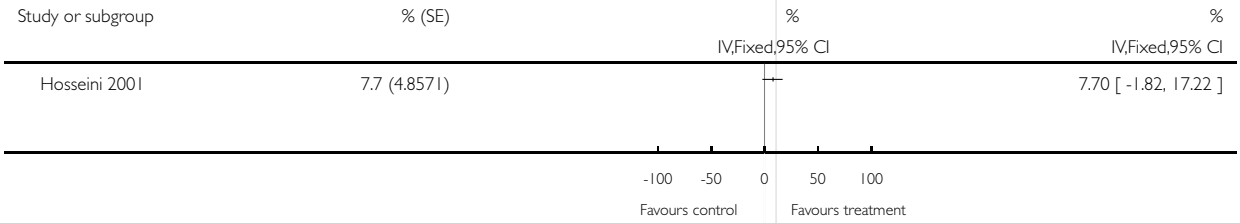


Analysis 13.8. Comparison 13 Pcynogenol (extract of French maritime bark) vs. placebo, Outcome 8 FEV1/FVC ratio CROSSOVER.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 13 Pcynogenol (extract of French maritime bark) vs. placebo

Outcome: 8 FEV1/FVC ratio CROSSOVER

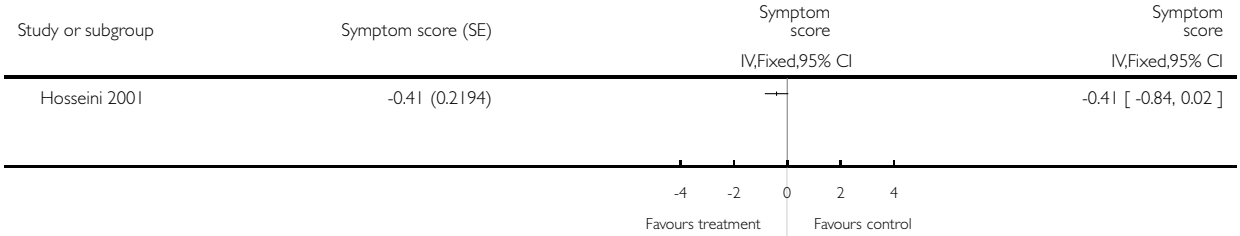


Analysis 13.9. Comparison 13 Pcynogenol (extract of French maritime bark) vs. placebo, Outcome 9 Asthma symptom score (1=mild, 4=severe) CROSSOVER.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 13 Pcynogenol (extract of French maritime bark) vs. placebo

Outcome: 9 Asthma symptom score (1=mild, 4=severe) CROSSOVER

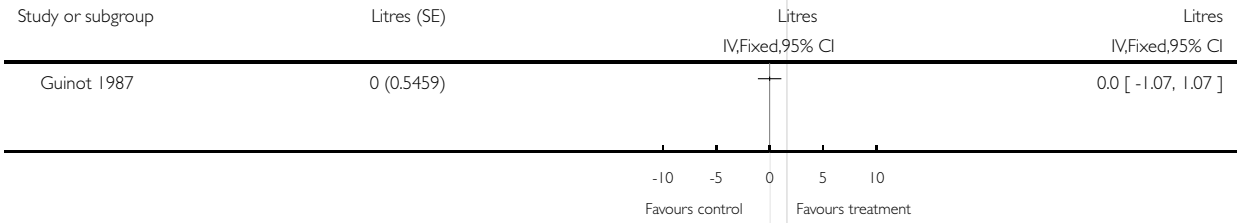


Analysis 14.1. Comparison 14 BN 52063 (Ginkgolides A, B & C) vs. placebo CROSSOVER, Outcome 1 FEV1.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 14 BN 52063 (Ginkgolides A, B % C) vs. placebo CROSSOVER

Outcome: 1 FEV1

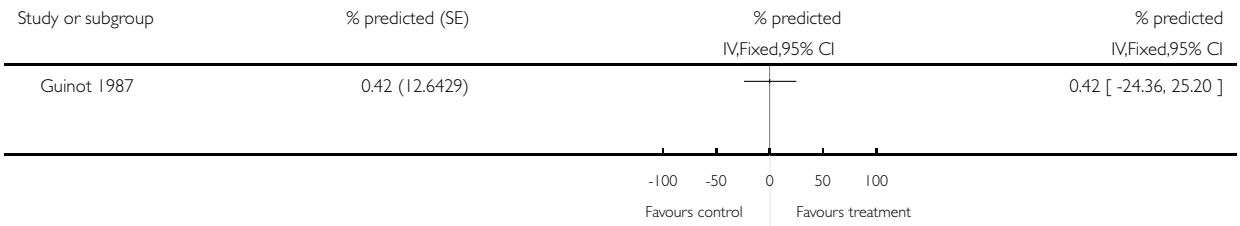


Analysis 14.2. Comparison 14 BN 52063 (Ginkgolides A, B & C) vs. placebo CROSSOVER, Outcome 2 FEV1 % predicted.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 14 BN 52063 (Ginkgolides A, B % C) vs. placebo CROSSOVER

Outcome: 2 FEV1 % predicted

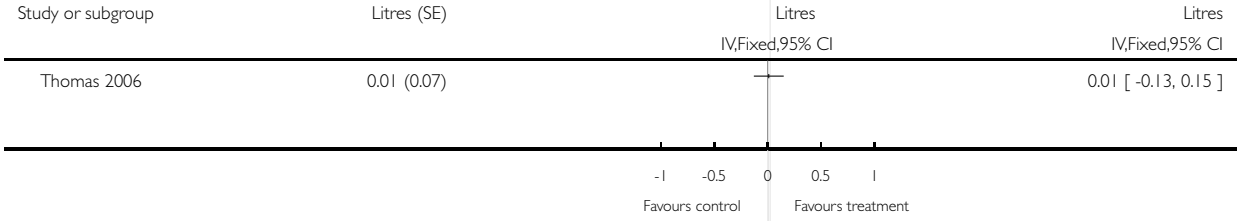


Analysis 15.1. Comparison 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER, Outcome 1 FEV1.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER

Outcome: 1 FEV1

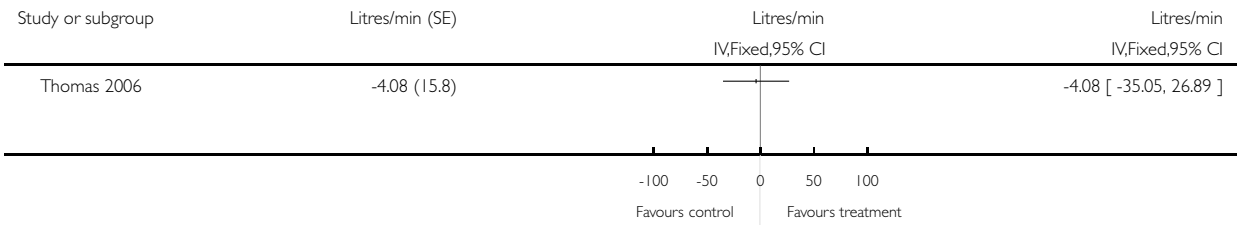


Analysis 15.2. Comparison 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER, Outcome 2 PEF.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER

Outcome: 2 PEF

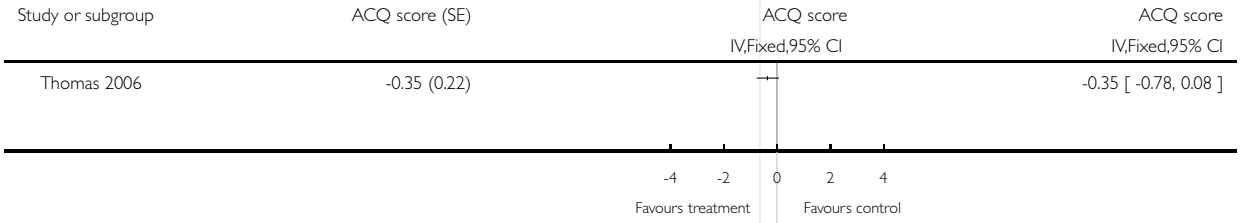


Analysis 15.3. Comparison 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER, Outcome 3 Asthma Control Questionnaire (ACQ).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER

Outcome: 3 Asthma Control Questionnaire (ACQ)

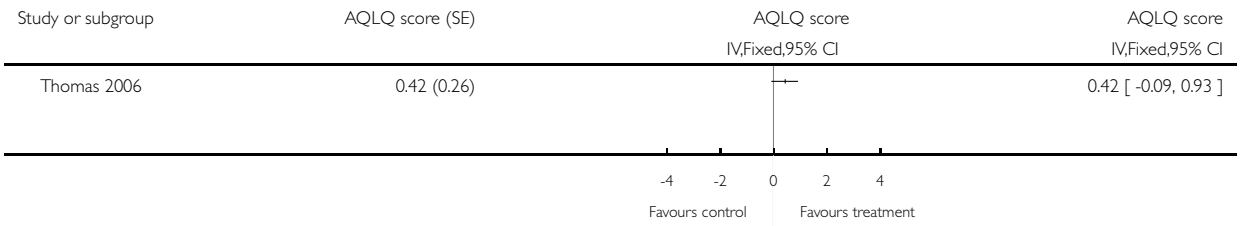


Analysis 15.4. Comparison 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER, Outcome 4 Asthma Quality of Life Questionnaire (AQLQ).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER

Outcome: 4 Asthma Quality of Life Questionnaire (AQLQ)

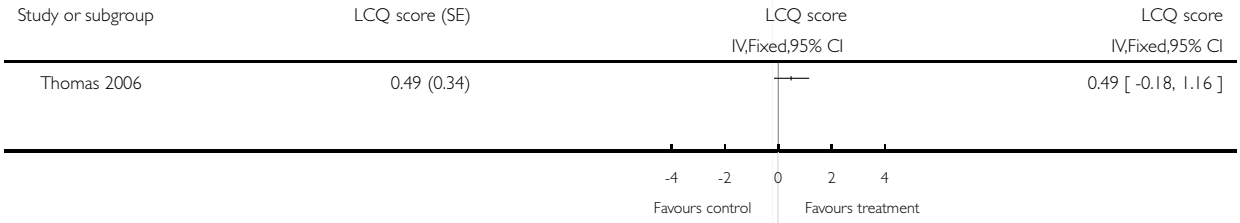


Analysis 15.5. Comparison 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER, Outcome 5 Leicester Cough Questionnaire (LCQ).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER

Outcome: 5 Leicester Cough Questionnaire (LCQ)



Analysis 15.6. Comparison 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER, Outcome 6 AQL (No. improved on treatment).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER

Outcome: 6 AQL (No. improved on treatment)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Thomas 2006	16/32	7/32		2.29 [1.09, 4.79]

Analysis 15.7. Comparison 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER, Outcome 7 AQLQ (No. improved on treatment).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 15 AKL1 (containing Ginkgo bilboa plus other unreported ingrediants) vs. placebo CROSSOVER

Outcome: 7 AQLQ (No. improved on treatment)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Thomas 2006	13/32	19/32		0.68 [0.41, 1.14]

Analysis 16.1. Comparison 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo, Outcome 1 No. patients with subjective improvement (assessed by allergists).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo

Outcome: 1 No. patients with subjective improvement (assessed by allergists)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Hsieh 1996	27/32	17/34		1.69 [1.17, 2.44]

Analysis 16.2. Comparison 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo, Outcome 2 No. patients with subjective improvement (assessed by Chinese doctors).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo

Outcome: 2 No. patients with subjective improvement (assessed by Chinese doctors)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Hsieh 1996	27/32	17/34		1.69 [1.17, 2.44]

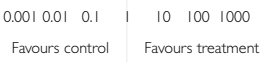
Analysis 16.3. Comparison 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo, Outcome 3 No. patients with subjective improvement (assessed by parents).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo

Outcome: 3 No. patients with subjective improvement (assessed by parents)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Hsieh 1996	29/32	19/34		1.62 [1.18, 2.23]



Analysis 16.4. Comparison 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo, Outcome 4 Change in symptom score.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo

Outcome: 4 Change in symptom score

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Hsieh 1996	32	-0.79 (0.63)	34	-0.39 (0.44)		-0.40 [-0.66, -0.14]

Analysis 16.5. Comparison 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo, Outcome 5 Change in medication score.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo

Outcome: 5 Change in medication score

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Hsieh 1996	32	-0.82 (2.23)	34	-0.44 (1.61)		-0.38 [-1.32, 0.56]

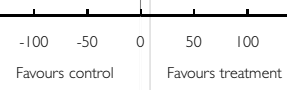
Analysis 16.6. Comparison 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo, Outcome 6 Change in early morning PEFR (L/min).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo

Outcome: 6 Change in early morning PEFR (L/min)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Hsieh 1996	32	39.33 (45.13)	34	30.67 (42.95)		8.66 [-12.62, 29.94]

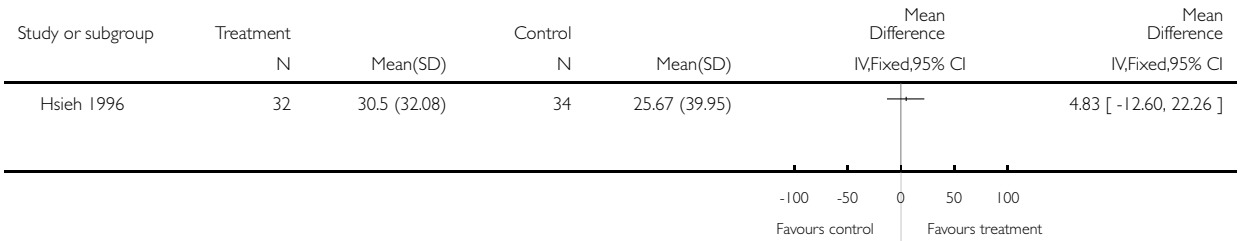


Analysis 16.7. Comparison 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo, Outcome 7 Change in evening PEFR (L/min).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 16 Liu-Wei-D-Huang-Wan ("Herb A") vs. placebo

Outcome: 7 Change in evening PEFR (L/min)

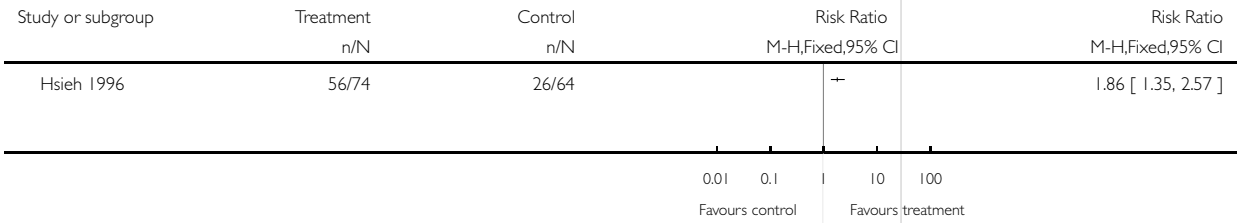


Analysis 17.1. Comparison 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo, Outcome 1 No. patients with subjective improvement (assessed by allergists).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo

Outcome: 1 No. patients with subjective improvement (assessed by allergists)



Analysis 17.2. Comparison 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo, Outcome 2 No. patients with subjective improvement (assessed by Chinese doctors).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo

Outcome: 2 No. patients with subjective improvement (assessed by Chinese doctors)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Hsieh 1996	60/74	32/64		1.62 [1.24, 2.12]

Analysis 17.3. Comparison 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo, Outcome 3 No. patients with subjective improvement (assessed by parents).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo

Outcome: 3 No. patients with subjective improvement (assessed by parents)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Hsieh 1996	62/74	32/64		1.68 [1.29, 2.18]

Analysis 17.4. Comparison 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo, Outcome 4 Change in symptom score.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo

Outcome: 4 Change in symptom score

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Hsieh 1996	74	-1.11 (0.84)	64	-0.8 (0.76)		-0.31 [-0.58, -0.04]

Analysis 17.5. Comparison 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo, Outcome 5 Change in medication score.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo

Outcome: 5 Change in medication score

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Hsieh 1996	74	-0.93 (2.92)	64	-0.34 (3)		-0.59 [-1.58, 0.40]

Analysis 17.6. Comparison 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo, Outcome 6 Change in early morning PEFR (L/min).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo

Outcome: 6 Change in early morning PEFR (L/min)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Hsieh 1996	74	44.67 (51.81)	64	34.34 (48)		10.33 [-6.33, 26.99]

Favours control Favours treatment

Analysis 17.7. Comparison 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo, Outcome 7 Change in evening PEFR (L/min).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 17 Shen-Ling-Bai-Shu-San ("Herb B") vs. placebo

Outcome: 7 Change in evening PEFR (L/min)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Hsieh 1996	74	38.17 (66.03)	64	28.84 (41.32)		9.33 [-8.80, 27.46]

Favours control Favours treatment

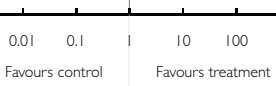
Analysis 18.1. Comparison 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo, Outcome 1 No. patients with subjective improvement (assessed by allergists).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo

Outcome: 1 No. patients with subjective improvement (assessed by allergists)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Hsieh 1996	39/55	18/44		1.73 [1.17, 2.57]



Analysis 18.2. Comparison 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo, Outcome 2 No. patients with subjective improvement (assessed by Chinese doctors).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo

Outcome: 2 No. patients with subjective improvement (assessed by Chinese doctors)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Hsieh 1996	41/55	18/44		1.82 [1.24, 2.68]

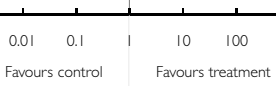
Analysis 18.3. Comparison 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo, Outcome 3 No. patients with subjective improvement (assessed by parents).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo

Outcome: 3 No. patients with subjective improvement (assessed by parents)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Hsieh 1996	44/55	22/44		1.60 [1.16, 2.21]



Analysis 18.4. Comparison 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo, Outcome 4 Change in symptom score.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo

Outcome: 4 Change in symptom score

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Hsieh 1996	55	-0.4 (0.44)	44	-0.59 (0.75)		0.19 [-0.06, 0.44]

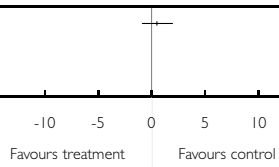
Analysis 18.5. Comparison 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo, Outcome 5 Change in medication score.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo

Outcome: 5 Change in medication score

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Hsieh 1996	55	-0.7 (3.02)	44	-1.2 (4.09)		0.50 [-0.95, 1.95]



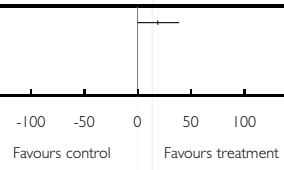
Analysis 18.6. Comparison 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo, Outcome 6 Change in early morning PEFR (L/min).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo

Outcome: 6 Change in early morning PEFR (L/min)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Hsieh 1996	55	40.67 (66.58)	44	21.34 (28.99)		19.33 [-0.24, 38.90]



Analysis 18.7. Comparison 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo, Outcome 7 Change in evening PEFR (L/min).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 18 Jia-Wei-Si-Jun-Zi-Tang ("Herb C") vs. placebo

Outcome: 7 Change in evening PEFR (L/min)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Hsieh 1996	55	36 (63.17)	44	16.83 (31.99)		19.17 [-0.01, 38.35]

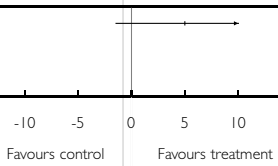
Analysis 19.1. Comparison 19 Din Chuan Tang (DCT) versus placebo, Outcome 1 FEV1 predicted %.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 19 Din Chuan Tang (DCT) versus placebo

Outcome: 1 FEV1 predicted %

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Chan 2006	28	98.28 (11.43)	24	93.25 (12.53)		5.03 [-1.53, 11.59]



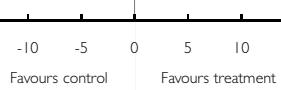
Analysis 19.2. Comparison 19 Din Chuan Tang (DCT) versus placebo, Outcome 2 FVC predicted %.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 19 Din Chuan Tang (DCT) versus placebo

Outcome: 2 FVC predicted %

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Chan 2006	28	97 (10.54)	24	94.13 (16.87)		2.87 [-4.93, 10.67]



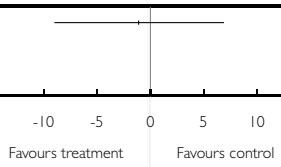
Analysis 19.3. Comparison 19 Din Chuan Tang (DCT) versus placebo, Outcome 3 Rescue-free days (%).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 19 Din Chuan Tang (DCT) versus placebo

Outcome: 3 Rescue-free days (%)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Chan 2006	28	74.71 (10.81)	24	75.78 (17.25)		-1.07 [-9.05, 6.91]



Analysis 19.4. Comparison 19 Din Chuan Tang (DCT) versus placebo, Outcome 4 Days of asthma attacks (%).

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 19 Din Chuan Tang (DCT) versus placebo

Outcome: 4 Days of asthma attacks (%)

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Chan 2006	28	1.37 (2.54)	24	3.52 (12.02)		-2.15 [-7.05, 2.75]

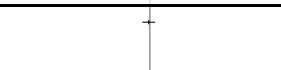
Analysis 19.5. Comparison 19 Din Chuan Tang (DCT) versus placebo, Outcome 5 Mean asthma attacks.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 19 Din Chuan Tang (DCT) versus placebo

Outcome: 5 Mean asthma attacks

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Chan 2006	28	0.33 (0.57)	24	0.43 (1.5)		-0.10 [-0.74, 0.54]



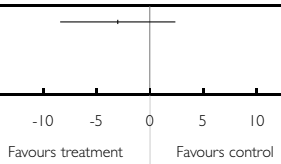
Analysis 19.6. Comparison 19 Din Chuan Tang (DCT) versus placebo, Outcome 6 Mean days when oral steroids required.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 19 Din Chuan Tang (DCT) versus placebo

Outcome: 6 Mean days when oral steroids required

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Chan 2006	28	1.25 (2.46)	24	4.22 (13.3)		-2.97 [-8.37, 2.43]



Analysis 19.7. Comparison 19 Din Chuan Tang (DCT) versus placebo, Outcome 7 Mean days when bronchodialtor required.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 19 Din Chuan Tang (DCT) versus placebo

Outcome: 7 Mean days when bronchodialtor required

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Chan 2006	28	8.92 (9.21)	24	10.27 (19.22)		-1.35 [-9.76, 7.06]

Analysis 19.8. Comparison 19 Din Chuan Tang (DCT) versus placebo, Outcome 8 Patients reducing ICS.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 19 Din Chuan Tang (DCT) versus placebo

Outcome: 8 Patients reducing ICS

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Chan 2006	9/28	12/24		0.64 [0.33, 1.26]

Analysis 20.1. Comparison 20 Ginger versus placebo, Outcome 1 No. patients experiencing dyspnea after treatment.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 20 Ginger versus placebo

Outcome: 1 No. patients experiencing dyspnea after treatment

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Rouhi 2006	37/46	44/46		0.84 [0.72, 0.98]

Analysis 20.2. Comparison 20 Ginger versus placebo, Outcome 2 No. patients experiencing wheeze after treatment.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 20 Ginger versus placebo

Outcome: 2 No. patients experiencing wheeze after treatment

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Rouhi 2006	36/46	46/46		0.78 [0.67, 0.92]

Analysis 20.3. Comparison 20 Ginger versus placebo, Outcome 3 No. patients experiencing chest tightness after treatment.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 20 Ginger versus placebo

Outcome: 3 No. patients experiencing chest tightness after treatment

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Rouhi 2006	12/46	41/46		0.29 [0.18, 0.48]

Analysis 21.1. Comparison 21 Indian herbal compound versus placebo, Outcome 1 FEV1.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 21 Indian herbal compound versus placebo

Outcome: 1 FEV1

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Murali 2006	22	1.69 (0.52)	19	1.5 (0.51)		0.19 [-0.13, 0.51]

Analysis 21.2. Comparison 21 Indian herbal compound versus placebo, Outcome 2 Symptom score.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 21 Indian herbal compound versus placebo

Outcome: 2 Symptom score

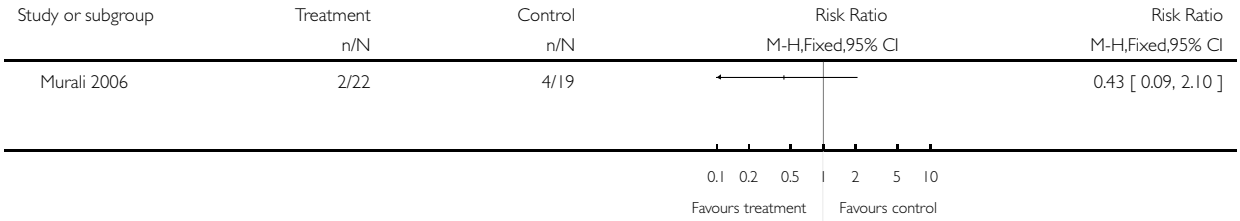
Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
Murali 2006	22	0.06 (0.25)	19	0.32 (0.55)		-0.26 [-0.53, 0.01]

Analysis 21.3. Comparison 21 Indian herbal compound versus placebo, Outcome 3 Headache.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 21 Indian herbal compound versus placebo

Outcome: 3 Headache

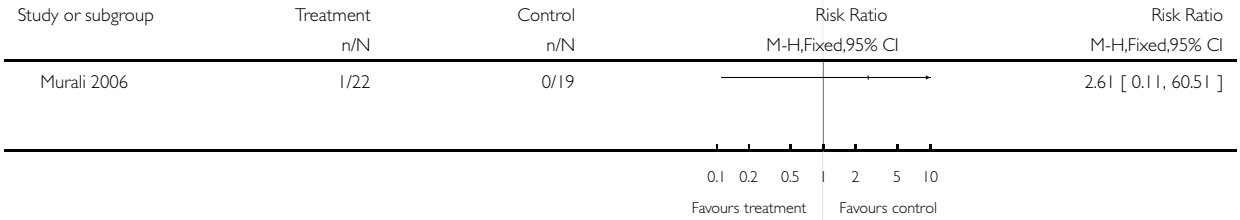


Analysis 21.4. Comparison 21 Indian herbal compound versus placebo, Outcome 4 Nausea.

Review: Herbal interventions for chronic asthma in adults and children

Comparison: 21 Indian herbal compound versus placebo

Outcome: 4 Nausea



ADDITIONAL TABLES

Table 1. Herbs used to treat asthma by culture (after Bielory 1999 & Ziment 2000)

Culture	Herbs used
CHINESE	Aconite; Artemesia; Asarum; Aster; Astragalus; Aurnantil; Bupleurum; Cinnabar; Cistanchis; Citrus reticulae; Coptis (goldenthread); Curculigo; Cornus; Cusctae; Dioscora (Chines yam); Epimedium; Fritillaria; Ginko bilboa; Ginseng; Gypsum; Juglandis; Kan lin (preparation); Licorice; Ligusticum chuan xiong; Longdan jichuan; Lumbricus spencer; Ma Huang (Epedra sinica); Magnolia; Minor Blue Dragon; Morus (mulberry) ; Peony; Perilla; Pinella; Prunus armeniacae (apricot/kernal); Psorale; Rehmannia; Scutellaria (skullcap); Tussilago (coltsfoot); Zingiber (ginger); Zizyphus (Chinese date)

Table 1. Herbs used to treat asthma by culture (after Bielory 1999 & Ziment 2000) (*Continued*)

JAPANESE (Kampo)	Hange-koboku-to; Moku-boi-tu; Saiboku-to; Shinpi-to; Sho-saiko-to; Sho-seiryu-to
INDIAN (Ayurvedic)	Ashatoda vasica (malabar nut); Coleus forskholii; Albizzia lekkek; Croton tiglium; Picrorrhiza kurroa; Tylophora indica/asthmatica (Indian ipecac)
LATIN AMERICAN	Allium cepa (onion); Aloe barbadensis; Desmodium (amor seco); Galphimia glauca
HAWAIIAN	Sophora chrysopylla; Aleurites moluccana (kukui, candlenut); Piper methysticum (kawa, kava); Solanum americum (popol, glossy nightshade)
WESTERN	Angelica; Belladonna (Deadly nightshade); Chinese skullcap; Coltsfoot; Coffee; Creosote; Garlic; Goldenseal; Henbane; Horseradish; Licorice; Ma Huang; Marijuana; Marshmallow; Mustard; Peppers (capsicums) ; Sarsparilla; Tea; Thyme; Wheatgrass

Table 2. Database search strategies

Database	Search
MEDLINE (combined with RCT filter)	1. exp ASTHMA/ 2. exp BRONCHIAL SPASM/ 3. asthma$.tw. 4. wheez$.tw. 5. bronchospas$.tw. 6. (bronch$ adj3 spas$).tw. 7. (bronch$ adj3 constrict$).tw. 8. bronchoconstrict$.tw. 9. or/1-8 10. Medicine, Herbal/ 11. exp PLANT PREPARATIONS/ 12. Plants, Medicinal/ 13. exp MEDICINE, TRADITIONAL/ 14. drugs, chinese herbal/ 15. herb$.tw. 16. plant$.tw. 17. phytotherap$.tw. 18. botanic$.tw. 19. (tradition$ adj3 medicine$).tw. 20. (chinese$ adj3 medicine$).tw. 21. ayurvedic$.tw. 22. kampo$.tw. 23. leaf.tw. 24. leaves.tw. 25. bark.tw. 26. root$.tw. 27. or/10-26 28. 9 and 27

Table 2. Database search strategies (*Continued*)

EMBASE (combined with RCT filter)	1. exp asthma/ 2. Bronchospasm/ 3. asthma$.tw. 4. wheez$.tw. 5. bronchospas$.tw. 6. (bronch$ adj3 spas$).tw. 7. (bronch$ adj3 constrict$).tw. 8. bronchoconstrict$.tw. 9. or/1-8 10. exp traditional medicine/ 11. exp Medicinal Plant/ 12. exp Plant Medicinal Product/ 13. exp Plant Extract/ 14. exp "tree"/ 15. herb$.tw. 16. plant$.tw. 17. phytotherap$.tw. 18. botanic$.tw. 19. (tradition$ adj3 medicine$).tw. 20. (chinese$ adj3 medicine$).tw. 21. ayurvedic$.tw. 22. kampo$.tw. 23. leaf.tw. 24. leaves.tw. 25. bark.tw. 26. root$.tw. 27. or/10-26 28. 9 and 27
CINAHL (combined with RCT filter)	1. exp ASTHMA/ 2. exp BRONCHIAL SPASM/ 3. asthma$.tw. 4. wheez$.tw. 5. bronchospas$.tw. 6. (bronch$ adj3 spas$).tw. 7. (bronch$ adj3 constrict$).tw. 8. bronchoconstrict$.tw. 9. or/1-8 10. herb$.tw. 11. plant$.tw. 12. phytotherap$.tw. 13. botanic$.tw. 14. (tradition$ adj3 medicine$).tw. 15. (chinese$ adj3 medicine$).tw. 16. ayurvedic$.tw. 17. kampo$.tw. 18. leaf.tw. 19. leaves.tw. 20. bark.tw.

Table 2. Database search strategies (*Continued*)

	21. root$.tw. 22. exp Medicine, Herbal/ 23. exp plants, medicinal/ 24. exp Plant Extracts/ 25. exp Plant Oils/ 26. exp MEDICINE, TRADITIONAL/ 27. or/10-26 28. 27 and 9
AMED (combined with RCT filter)	exp Asthma/ 2. asthma.mp. 3. wheez$.mp. 4. bronchospas$.mp. 5. bronchoconstrict$.mp. 6. (bronch$ adj3 spas$).mp. 7. (bronch$ adj3 constrict$).mp. 8. or/1-7 9. herbalism/ 10. exp herbal drugs/ 11. exp plants medicinal/ 12. exp plant extracts/ 13. exp traditional medicine/ 14. exp trees/ 15. herb$.mp. 16. plant$.mp. 17. phytotherapy/ 18. phytotherap$.mp. 19. botanic$.mp. 20. exp plant oils/ 21. (tradition$ adj3 medicine$).mp. 22. (chinese$ adj3 medicine$).mp. 23. ayurvedic$.mp. 24. kampo$.mp. 25. leaf.mp. 26. leaves.mp. 27. bark.mp. 28. root$.mp. 29. or/9-28 30. 8 and 29

Table 3. Studies awaiting assessment

Study	Issue
Baranetchi 1985	Not able to locate full-text
Barkatullah 1991	Not able to locate full text.

Table 3. Studies awaiting assessment (*Continued*)

Li 1997	Not able to locate full text.
Li 2000	Not able to locate full text.
Sengupta 2002	Not able to locate full text.
Shen 1986	Not able to locate full text.
Shivpuri 1968	Not able to locate full text.
Yu 2003	Not able to locate full text.

Table 4. Studies reporting insufficient data / outcomes irrelevant to this review

Study ID	Issue
Ebden 1989	Symptom scores recorded but results not presented
Hederos 1996	No asthma sub-group outcomes reported, no data extracted or entered
Mansfeld 1998	SD's not reported
Shivpuri 1969	Only 2 outcomes. Not all patients followed up at 12 weeks
Thiruvengadam 1978	SD's not reported
Thomas 2006	No information on ingredients of treatment, or dosage
Ziboh 2004	Only I outcome relevant to the review (FEV1). SD's not reported
Hsieh 1996	Means & SEs presented graphically and therefore had to be estimated from graph measurements
Lau 2004	Some data presented graphically as for Hsieh 1996
Sekhar 2003	Not clear if trial is truly randomised. No SDs reported.

WHAT'S NEW

Last assessed as up-to-date: 12 November 2007.

Date	Event	Description
12 June 2008	Amended	Converted to new review format. Risk of bias tables added. Minor corrections to references and results section. Conclusions are unchanged

HISTORY

Protocol first published: Issue 2, 2006

Review first published: Issue 1, 2008

Date	Event	Description
13 November 2007	New citation required and conclusions have changed	Substantive amendment

CONTRIBUTIONS OF AUTHORS

For the Protocol:

EA: initiation and draft of protocol

CC: draft of protocol

TL: draft of protocol

For the Review:

EA: electronic searches, screening of search results, retrieval of papers, selection of studies, arrange for any translations, data extraction, data analysis and write-up of review

CC: screening of search results, selection of studies, data extraction, data analysis and write-up of review

TL: Assessment/translation of French & German papers, data extraction, data analysis, write-up of review,

TXW: Assessment/translation of Chinese papers.

DECLARATIONS OF INTEREST

None known.

SOURCES OF SUPPORT

Internal sources

- St George's, University of London, UK.

External sources

- Plymouth teaching PCT, UK.

INDEX TERMS

Medical Subject Headings (MeSH)

Asthma [*drug therapy]; Chronic Disease; Phytotherapy [*methods]; Plant Preparations [*therapeutic use]; Randomized Controlled Trials as Topic

MeSH check words

Adult; Child; Humans