Herbal medicines for treatment of bacterial infections: a review of controlled clinical trials

Martin K W, Ernst E

CRD summary
This review assessed the efficacy of herbal medicines in the treatment of bacterial infections. The authors concluded that the efficacy of herbal medicines is yet to be demonstrated, and large scale, well-designed studies are required. The authors' cautious conclusion is appropriate considering the small number, size and low quality rating of trials included in the review.

Authors' objectives
To assess the efficacy of herbal medicines in the treatment of bacterial infections.

Searching
MEDLINE, EMBASE, CISCOM and the Cochrane Library were searched up to October 2002; a brief description of the search strategy was given. There was no language restriction. The authors also searched departmental files and the reference lists of retrieved articles.

Study selection

Study designs of evaluations included in the review
Controlled clinical trials were eligible for inclusion. Randomised and non-randomised trials were included.

Specific interventions included in the review
Trials reporting the experimental use of a single or whole plant extract for treating bacterial infections were eligible for inclusion. Herbal rinses used for oral hygiene, herbal mixtures, single constituents derived from plant extracts, and treatments for the prevention of bacterial infections or for the stimulation of immunity, were excluded. The interventions included in the review were: allicin (from either 275 mg garlic oil three times a day or 10 cloves of garlic per day), capsaicin (from 6 jalapeno peppers per day), cinnamon extract (40 mg twice a day), tea tree oil (either 4 or 5%), tea extract (1 or 5%) and Ocimum gratissimum oil (0.5 to 5% twice a day). Bismuth subsalicylate, omeprazole, mupirocin, triclosan, framycetin, gramicidin, cefalexin, benzoyl peroxide and placebo were comparator or control interventions.

Participants included in the review
Specific inclusion criteria for the participants were not reported. People with Helicobacter pylori infection, methicillin-resistant Staphylococcus aureus (MRSA), impetigo, and acne were included in the review.

Outcomes assessed in the review
Specific inclusion criteria for the outcomes were not reported. The outcomes reported included changes in the urea breath test, histology, urease test, eradication of MRSA, cure rate and reduction in acne lesions.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors assessed the validity of the randomised controlled trials (RCTs) using the Jadad scale (see Other Publications of Related Interest). The authors did not state how the papers were assessed for validity, or how many reviewers performed the validity assessment.

Data extraction
The data were extracted by one reviewer and checked by a second reviewer.

**Methods of synthesis**

**How were the studies combined?**
The review was a narrative synthesis, grouped by the participants' condition.

**How were differences between studies investigated?**
The authors tabulated summary details for each study, and described the characteristics of each study separately in the narrative.

**Results of the review**
Seven studies (n=448) were included in the review. Of these, 4 were RCTs (n=312), 2 were non-randomised trials with parallel groups (n=124) and 1 was a non-randomised crossover trial (n=12).

All of the RCTs scored a Jadad score of 2 out of 5.

In one RCT, only bismuth subsalicylate, a control intervention, significantly reduced the urea breath test value (from 55.8 to 14.3) in patients with Helicobacter pylori infection (P<0.001). The results from three RCTs reported that the experimental interventions, fresh garlic (10 cloves per day or 275 mg garlic oil three times a day), jalapeno peppers (6 per day) or cinnamon (40 mg twice a day) did not produce significant changes in the urea breath test value.

In one RCT, both tea tree oil (experimental intervention) and benzoyl peroxide (control intervention) reduced the number of lesions in people with acne. In another, Ocimum gratissimum oil in concentrations of 2 to 5% was significantly more effective at reducing the number of lesions in those with acne than benzoyl peroxide (P<0.05).

One non-randomised study reported cure rates of 81.3%, 72.2% and 78.6% with 5% tea extract, framycetin and gramicidin ointments, and oral cefalexin, respectively; the cure rate of 1% aqueous tea extract was lower at 37.5%. A second RCT showed no difference between tea tree oil and mupirocin or triclosan for the eradication of MRSA.

**Authors' conclusions**
The authors concluded that, although there may be potential benefits from some herbal preparations, the efficacy of herbal medicines has yet to be demonstrated beyond doubt.

**CRD commentary**
The search for eligible studies was adequate, with attempts to identify both published and unpublished data and no language restriction. These factors reduced the risk of publication and language bias. Methodological rigour and the potential for the introduction of bias were difficult to assess since details of the methods for selecting the studies, judging the validity and extracting the data were not reported. The RCTs were assessed for validity and all four were of the same poor quality, as highlighted in the narrative. A narrative synthesis of the studies was undertaken, which was appropriate given the clinical heterogeneity of the included studies. The authors’ cautious conclusion is appropriate considering the small number of trials and participants, and the low quality of the included trials.

**Implications of the review for practice and research**
Practice: The authors did not state any implications for practice.

Research: The authors suggested further large-scale, well-designed clinical trials.

**Bibliographic details**
Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Acne Vulgaris /drug therapy; Animals; Bacterial Infections /therapy; Controlled Clinical Trials as Topic; Helicobacter Infections /drug therapy; Helicobacter pylori; Humans; Phytotherapy; Plant Extracts /therapeutic use; Staphylococcal Infections /drug therapy; Streptococcal Infections /drug therapy