Evaluation of echinacea for the prevention and treatment of the common cold: a meta-analysis


CRD summary
This review of randomised trials found that treatment with echinacea significantly reduced cold incidence and duration compared with placebo. The review had some potential limitations (the possibility of missed studies and possible bias in the study selection process) but, overall, the authors’ conclusions and recommendations for further research are in line with the evidence presented and appear reliable.

Authors’ objectives
To evaluate the effect of echinacea on the incidence and duration of the common cold.

Searching
MEDLINE (to April 2006), CINAHL (to April 2005), Web of Science (to April 2006) and the Cochrane Database of Systematic Reviews (to December 2005) were searched; the search terms were reported. References in the echinacea monograph of the Natural Medicines Comprehensive Database and in relevant primary and review articles were also screened.

Study selection
Randomised placebo-controlled trials of echinacea-containing products in the prevention and/or treatment of the common cold were eligible. Trials were required to report on either cold incidence or duration. The included studies evaluated a range of echinacea products including the commercial products Echinacin and Echinaguard. The duration of treatment ranged from the duration of the cold to 12 weeks. Participants in some studies took vitamin C or other supplements during treatment. The majority of studies involved natural cold exposure but some participants were inoculated with rhinovirus 39 or rhinovirus 23, in which case treatment with echinacea or placebo began before inoculation. Most of the included studies did not report the participants’ age, but some studies were restricted to children.

The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
Studies were assessed for randomisation, allocation concealment, blinding and handling of withdrawals. Jadad scores (ranging from 1 to 5) were calculated.

Three independent reviewers evaluated the studies, with any disagreements resolved by consensus.

Data extraction
For cold incidence, data on the number of colds in each group were used to derive an odds ratio (OR) with 95% confidence interval (CI); the risk difference between treatment groups was also calculated. Data on mean cold duration and its standard deviation were used to calculate the mean difference between treatment groups.

Three independent reviewers extracted the data using a standardised data extraction tool.

Methods of synthesis
Pooled ORs and weighted mean differences (WMDs) were calculated, along with 95% CIs, using a random-effects model (DerSimonian and Laird). Statistical heterogeneity was assessed using the Q statistic (p<0.1 considered significant). Heterogeneity was also assessed by visual inspection of L’Abbe plots. Subgroup analyses were conducted to assess sources of clinical heterogeneity, including concomitant treatments, type of echinacea product and type of cold
exposure (natural or inoculation). Sensitivity analyses involved excluding studies of weaker methodology (Jadad score less than 3) and using a fixed-effect (Mantel Haenszel) meta-analysis. The risk of publication bias was assessed by Egger’s weighted regression method and visual inspection of funnel plots.

**Results of the review**
Fourteen studies (n=1,356 for incidence; n=1,630 for duration) were included in the review. Five studies recruited people with active colds and nine recruited healthy volunteers.

The Jadad scores ranged from 1 to 5, with 11 studies scoring 3 or more.

Treatment with echinacea significantly reduced cold incidence (pooled OR 0.42, 95% CI: 0.25, 0.71; based on 9 studies) and duration (pooled WMD -1.44 days, 95% CI: -2.24, -0.64; based on 7 studies). The Q statistic indicated significant heterogeneity for both outcomes. L’Abbe plots indicated that studies varied in their estimates of the magnitude of the effect of echinacea, but not its direction. The effect of echinacea on cold incidence remained statistically significant in all of the subgroup and sensitivity analyses, but the effect on cold duration was not significant when echinacea was taken without other supplements. Despite some asymmetry observed in the funnel plots, Egger’s weighted regression analysis did not suggest the presence of significant publication bias.

**Authors’ conclusions**
Echinacea has a benefit in reducing the incidence and duration of the common cold.

**CRD commentary**
This review had clear inclusion criteria for the study design, interventions and outcomes. The authors searched a range of relevant sources; it is unclear whether any language restrictions were imposed, so it is possible that some relevant evidence could have been omitted. Unpublished studies were not sought, but the risk of publication bias was assessed. Validity was assessed using a standard scale, although only summary scores were reported; this makes it impossible for the reader to assess specific aspects of validity. The validity assessment and data extraction processes were performed by up to three independent reviewers, thereby reducing the risk of reviewer error and bias. However, it is unclear whether the study selection was conducted in duplicate, so there is a possibility of bias and error in this aspect of the review. Adequate details of the included studies were presented. Most of the included studies were small, with wide CIs for the measures of treatment effect. The studies were pooled in a meta-analysis, and clinical and statistical heterogeneity were assessed using appropriate methods. The review had some potential limitations (possibility of missed studies and possible bias in the study selection process) but, overall, the authors’ conclusions and recommendations for further research are in line with the evidence presented and appear reliable.

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

Research: The authors stated that further large-scale trials controlling for echinacea species, quality of preparation, dose and method of cold induction, and using objective end points, are needed.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.