Interventions for preventing or treating alcohol hangover: systematic review of randomised controlled trials

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CRD summary
This review assessed a variety of conventional and complementary interventions to prevent or treat alcohol hangover. The authors concluded that there was no strong evidence for the effectiveness of any of the included interventions. Some omissions in reporting and the failure to address potential confounding factors may mean that the reliability of the results, and thus the authors' conclusions, are unclear.

Authors' objectives
To investigate the effectiveness of medical interventions for preventing or treating alcohol hangover.

Searching
MEDLINE (1951 to 2005), EMBASE (1974 to 2005), AMED (1985 to 2005), the Cochrane Library (Issue 1, 2005), the UK National Research Register (to January 2005) and ClinicalTrials.gov (to January 2005) were searched for relevant studies; the search terms were reported. Conference proceedings (Focus on Alternative and Complementary Therapies, 1996 to 2005) and the authors' collections of papers and medical journals (Phytomedicine, 1994 to 2005; Alternative and Complementary Therapies, 1995 to 2005; and Forschende Komplementarmedizin Klassische Naturheilkunde, 1994 to 2005) were handsearched. In addition, bibliographies were checked and product manufacturers or experts were contacted for further relevant studies. There were no language restrictions.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were eligible for inclusion in the review.

Specific interventions included in the review
Studies that compared any medical intervention for preventing or treating alcohol hangover with placebo or a comparator were eligible for inclusion. Those included were dietary supplements and conventional agents. The dietary supplements comprised borago officinalis (borage), cynara scolymus (artichoke), opuntia ficus-indica (prickly pear) and a yeast-based preparation. The conventional agents were tropisetron, propranolol, toltenamic acid, and fructose or glucose. A variety of intervention doses and regimens were applied. Most of the studies also involved controls of lifestyle factors, including restrictions on food and drink consumption. Further details were given.

Participants included in the review
The inclusion criteria were not specific. The majority of the included participants were healthy volunteers. One study assessed alcoholics.

Outcomes assessed in the review
The inclusion criteria were not specific. An overall hangover symptom score was reported in the majority of the included studies. Components of this score were restlessness, discomfort and impatience, headache, laziness, tiredness, nausea, vomiting, thirst, dry mouth, tremor and irritation. None of the studies generally revealed the name of the tool, or the method of scoring; the exception was one study that used a visual analogue scale to measure vomiting, nausea, appetite and headache.

How were decisions on the relevance of primary studies made?
Two reviewers independently assessed the titles and abstracts of studies.
Assessment of study quality
The authors used the Jadad instrument to assign a quality score (1 to 5) to each included study. Two reviewers independently assessed the methodological quality of the studies.

Data extraction
Two reviewers independently extracted the data from the primary studies. Any disagreements were resolved by discussion. Data were extracted on alcohol intake, intervention and dose, overall hangover symptom score (in order to calculate differences between the groups) and the control of lifestyle factors (e.g. food and beverage intake around the time of the intervention). Adverse events were extracted where available.

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative according to the type of intervention (dietary or conventional).

How were differences between studies investigated?
The heterogeneity of the data was confirmed in the tables and discussed in the text.

Results of the review
Eight double-blind RCTs were included in the review. Four were crossover trials and one study was unpublished. The number of participants randomised was 340, but there was incomplete reporting of how many of these participants were analysed.

The results of the quality assessment showed that two studies scored 2 out of a possible value of 5 on the Jadad scale, three studies scored 3, two studies scored 4 and one study scored 5.

Dietary supplements.
Four trials tested dietary supplements. Statistically significant differences were observed between the overall hangover symptom scores of groups in one trial using gamma-linolenic acid from borago officinalis (borage) and in another using a yeast-based preparation, when compared with placebo. Specific reductions in headache, laziness and tiredness were observed in the former trial (P<0.01). In the yeast-based trial, specific reductions in discomfort, restlessness and impatience were observed (P<0.05). The other two trials (testing cynara scolymus and opuntia ficus-indica) did not report any statistically significant differences between the groups (P>0.05).

The study that evaluated cynara scolymus reported redness in the face in one case of those receiving the intervention.

Conventional agents.
Four trials tested conventional agents. A statistically significant difference was observed in the overall hangover symptom score between groups given tolfenamic acid in comparison with placebo (P<0.01). Specific reductions in headaches, nausea, vomiting, thirst, dry mouth, tremor and irritation were seen. The remaining trials (employing propranolol, tropisetron, and fructose or glucose) did not report any statistically significant differences between the groups (P>0.05).

The study that evaluated tolfenamic acid reported swollen eyes and slight dysuria in two cases of those receiving the intervention.

Authors’ conclusions
No strong evidence exists to support the effectiveness of conventional or complementary interventions to prevent or treat alcohol hangover. Single, small RCTs have indicated the potential effectiveness of borago officinalis (borage), a yeast-based combination preparation and tolfenamic acid.
CRD commentary
The review was based on broad criteria for the interventions; no specific inclusion criteria were applied for the participants or outcomes. This may mean that subjective decisions directed the final inclusion of studies. The search strategy was comprehensive and enabled the potential to retrieve published and unpublished data without language restrictions. It is possible that RCTs in this topic area may not have been published and, therefore, might have been missed from the search strategy. Adequate steps were taken to minimise biases in the review process. The quality assessment was carried out using a validated scale, although there was no discussion of the impact of methodological quality on the results.

The study details given omitted to show the total number of evaluated participants and their characteristics, beyond the fact that most were healthy volunteers. This potentially impacts on the generalisability of the results. The absence of detail on the outcome measurement tool, along with a lack of attention to potentially confounding factors (such as food and beverage intake surrounding the intervention period) also limits the reliability of the results. These limitations may be due to inadequate reporting in the individual studies. However, the authors’ conclusion is an accurate reflection of the results presented, and some useful implications for research and practice were given.

Implications of the review for practice and research
Practice: The authors stated that the many hangover cures currently available on the Internet should be considered with caution.

Research: The authors stated that future studies should investigate the pathology of alcohol hangover in conjunction with the development of effective interventions. They also referred to the need for a sensitive standard outcome measure to assess the effects of alcohol hangover.

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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.