The efficacy of ginger for the prevention of postoperative nausea and vomiting: a meta-analysis
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CRD summary
The review investigated the effect of a fixed-dose of 1 g or more of ginger on the incidence of 24-hour post-operative nausea and vomiting (PONV). The review concluded that ginger reduced the incidence of PONV in patients undergoing gynaecological or lower extremity surgery. The conclusion appears to follow from the data presented, although it may not be representative of all patient subgroups.

Authors' objectives
To compare the effect of a fixed-dose of ginger to placebo on the incidence of 24-hour post-operative nausea and vomiting (PONV).

Searching
MEDLINE, International Pharmaceutical Abstracts, CINAHL, the Cochrane CENTRAL Register, HealthSTAR and Current Contents were searched with no language restrictions. The search terms were reported, but the dates of the searches were not. The bibliographies of the retrieved articles were checked and pharmaceutical companies, authors and experts in this field were contacted for additional studies.

Study selection
Study designs of evaluations included in the review
Randomised placebo-controlled trials were eligible for inclusion. All of the included studies were double-blind randomised controlled trials (RCTs). The authors did not report the follow-up period, but it appears that were patients were followed up for up to 24 hours after the operation.

Specific interventions included in the review
Studies in which at least 1 g of ginger (Zingiber officinale) was administered for the prevention of PONV were eligible for inclusion. The comparator was placebo. The dose of ginger was 1 g administered an hour before the induction of anaesthesia. In one study an additional 1 g was administered before discharge.

Participants included in the review
Inclusion criteria were not specified for the participants. The included studies selected the participants from patients undergoing gynaecological laparoscopy, lower extremity surgery or mixed surgery types. Where reported, the mean age of the participants ranged from 31 to 46 years and their mean weight from 51 to 67 kg. The majority of the participants were Asian. The average duration of surgery ranged from 20 to 115 minutes. Only one study reported that participants were not administered morphine; the majority of studies did not report whether morphine was administered.

Outcomes assessed in the review
Studies reporting or providing sufficient data to calculate the incidence of 24-hour PONV or post-operative vomiting (POV) were eligible for inclusion.

How were decisions on the relevance of primary studies made?
Two reviewers selected studies for inclusion. The authors did not state whether the reviewers performed the study selection independently or how any disagreements were resolved.

Assessment of study quality
The authors stated that they used the criteria developed by Jadad et al. to assess the validity of the trials. The criteria
included random allocation, blinding, and description of drop-outs and withdrawals. The authors also assessed whether the amount of active ingredient in each ginger preparation was analysed.

Two reviewers assessed validity, although the authors did not state whether the reviewers performed the validity assessment independently. Any disagreements were resolved by discussion.

Data extraction
Two independent reviewers extracted the data. The authors did not state how any possible disagreements were resolved. Data were extracted on the number and characteristics of the patients, the amount of ginger administered, surgical procedures, duration of surgery, types of anaesthesia, and incidence of 24-hour PONV and POV.

Methods of synthesis

How were the studies combined?
The random-effects model of DerSimonian and Laird was used to calculate the overall relative risk (RR) and 95% confidence interval (CI) for PONV and POV. The authors stated that a funnel plot was used to assess publication bias.

How were differences between studies investigated?
The authors stated that heterogeneity was assessed by the Mantel-Haenszel method.

Results of the review
Five RCTs (n=363) were included. An additional study in which 0.3 or 0.6 g of ginger was administered was later included in a sensitivity analysis (n=116).

Overall, ginger at a fixed dose of 1 g or greater was associated with a statistically significant decrease in the incidence of 24-hour PONV (RR 0.65, 95% CI: 0.51, 0.84; 3 RCTs) and POV (RR 0.62, 95% CI: 0.46, 0.84; 5 RCTs) compared with placebo.

The authors performed a sensitivity analysis by including an additional study in which the dose of ginger was 0.3 or 0.6 g. By including this study ginger was still associated with a statistically significant decrease in the incidence of PONV (RR 0.74, 95% CI: 0.56, 0.98), but the difference in incidence of POV was no longer statistically significant (RR 0.75, 95% CI: 0.52, 1.07).

One adverse effect (abdominal discomfort) was reported in the intervention group in one study.

Four studies had a Jadad score of 3 for quality, whilst the other included study had a score of 4. None of the studies reported the amount of active ingredients or the quality of the ginger preparation. No data on publication bias or statistically significant heterogeneity was reported.

Authors' conclusions
Ginger at a fixed dose of at least 1 g can significantly reduce the incidence of 24-hour PONV and POV in patients undergoing gynaecological and lower extremity surgery.

CRD commentary
The review question and inclusion criteria were clear in terms of the study design, interventions and outcomes of interest, but no inclusion criteria for the participants were stated. The authors searched several major health databases, with no language restrictions, and also contacted pharmaceutical companies and experts in the field in an attempt to identify relevant studies, thus reducing the potential for language bias and publication bias. The study selection, quality assessment and data extraction procedures were carried out in duplicate, which reduces the potential for reviewer bias or error. Quality was assessed using an appropriate validated scale. Adequate details of the included studies were reported. The authors did not report any data on heterogeneity or publication bias, nor did they discuss possible reasons for variations in the results, in particular the possible effects of patient characteristics (e.g. weight) and type of
operation. Three of the five included studies were carried out in patients undergoing out-patient gynaecological laparoscopy. In addition, the majority of the participants were Asian with an average weight of 51 to 67 kg. Therefore, the findings of this review might not be representative of all subgroups, particularly patients undergoing other types of surgery and patients with a greater body weight (especially those of Western descendants). The authors acknowledged this in their discussion.

The authors' conclusion appears to follow from the evidence presented, although the findings may not be representative of all patient subgroups.

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

**Practice:** The authors stated that ginger is an effective option for the prevention of PONV. Its widespread availability, low cost and great tolerability profile mean that ginger may be an attractive option, at least as a component in the combined anti-emetic regimen, especially in countries in which cost of care is a major issue.

**Research:** The authors stated that the exact role of ginger in the prevention of PONV may be elucidated by further studies. They also stated that RCTs in participants with greater body weight, especially those of Western descendants, are warranted.

**Bibliographic details**


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**Other publications of related interest**

This additional published commentary may also be of interest. Thompson HJ, Potter PJ. Review: ginger prevents 24 hour postoperative nausea and vomiting. Evid Based Nurs 2006;9:80.

**Indexing Status**

Subject indexing assigned by NLM

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the reliability of the review and the conclusions drawn.