A quantitative systematic review of ondansetron in treatment of established postoperative nausea and vomiting
Tramer M R, Moore R A, Reynolds D J, McQuay H J

Authors' objectives
To assess the evidence for a dose-response with ondansetron for the treatment of post-operative nausea and vomiting, and to establish whether differences in efficacy between doses are of clinical relevance.

Searching
MEDLINE was searched from 1991 to January 1996 for publications in any language, using the search terms 'ondansetron' and 'human' combined with 'emesis', 'nausea' or 'vomiting', but not 'chemotherapy' or 'cancer'. Additional material was obtained by examining reference lists of retrieved reports, review articles from anaesthesia journals and a manufacturer's database of published trials. No search was undertaken of grey literature.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) evaluating the effect of ondansetron compared with a control (placebo, no treatment, or another anti-emetic) on established post-operative nausea and vomiting, reporting outcome in dichotomous form.

Specific interventions included in the review
Ondansetron, droperidol, metoclopramide and placebo.

Participants included in the review
Post-operative patients of differing age, sex and morbidities (including gynaecology patients, children, and patients undergoing major abdominal surgery; excluding cancer patients).

Outcomes assessed in the review
Efficacy of intervention in the complete control of further nausea and vomiting by the odds ratio (OR) and the number-needed-to-treat (NNT) for early (within 6 hours of administration) and late (within 24 hours) periods.

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

Assessment of study quality
The method and adequacy of randomisation and blinding of the study, as well as the description of withdrawals, were scored 1 point per item, with a possible overall score ranging from 1 to 5. The papers were assessed for validity by three independent authors, and any differences resolved through consensus.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the authors performed the data extraction.

Methods of synthesis
How were the studies combined?
The studies were combined by ORs and 95% confidence intervals (CIs) using a fixed-effect model, and by point
estimates and 95% CIs of the NNT.

**How were differences between studies investigated?**
Homogeneity was assessed through the use of scatter plots of success rates with ondansetron versus success rates with control.

**Results of the review**
Seven RCTs (1,252 patients) were included.

ORs showed a significant difference between each of the three doses of ondansetron and placebo for both early and late efficacy, no difference between ondansetron and droperidol for early efficacy, and no difference between ondansetron and metoclopramide for both early and late efficacy. It should be noted that some comparisons are based on 1 trial.

For early anti-emetic efficacy, ORs for different doses of ondansetron compared to placebo were: 3.0 (95% CI: 1.8, 4.8) for 1 mg (1 trial), 3.5 (95% CI: 2.1, 5.8) for 4 mg (1 trial), and 3.8 (95% CI: 2.5, 5.8) for 8 mg (3 trials). For late anti-emetic efficacy, ORs for different doses of ondansetron compared to placebo were: 2.7 (95% CI: 1.8, 3.9) for 1 mg (2 trials), 3.2 (95% CI: 2.2, 4.7) for 4 mg (2 trials), and 3.1 (95% CI: 2.1, 4.5) for 8 mg (2 trials).

For early anti-emetic efficacy compared to intravenous droperidol, the combined OR was 0.7 (95% CI: 0.3, 1.4; 2 trials), while for early and late anti-emetic efficacy compared with intravenous metoclopramide, the ORs were 2.3 (95% CI: 0.7, 6.7; 1 trial) and 1.8 (95% CI: 0.8, 4.3; 1 trial), respectively.

The NNT point estimates for early efficacy with ondansetron, compared with placebo, were: 3.8 (95% CI: 2.6, 6.6) for 1 mg (1 trial), 3.2 (95% CI: 2.3, 5.2) for 4 mg (1 trials), and 3.1 (95% CI: 2.4, 4.5) for 8 mg (3 trials). For late anti-emetic efficacy, the NNT point estimates were 4.8 (95% CI: 3.5, 7.9) for 1 mg (2 trials), 3.9 (95% CI: 3.0, 5.7) for 4 mg (2 trials), and 4.1 (95% CI: 3.1, 6.2) for 8 mg (2 trials). Comparisons of anti-emetic efficacy of ondansetron with intravenous droperidol and intravenous metoclopramide showed no significant difference between treatments in terms of NNT.

Assessment of heterogeneity of the trials showed there was no significant effect.

**Authors’ conclusions**
Ondansetron used as treatment for established post-operative nausea and vomiting was effective compared to placebo, although there were no significant dose-response effects. There were no significant differences between ondansetron and either droperidol or metoclopramide. Ondansetron prevented 1 in 4 patients with nausea or vomiting from further nausea and vomiting compared to placebo.

**CRD commentary**
This review adheres to many of the qualities of a good systematic review, with a clearly-written and well-presented analysis. Objectives, interventions, outcomes, search strategy, inclusion and quality criteria, methods of applying the quality criteria and results are detailed.

The search strategy indicates that grey literature was not searched, potentially excluding unpublished studies. No information was provided on decisions of relevance concerning primary studies, or the process by which data were extracted. Limited information was provided on the patients included within the RCTs, specifically, age, sex or morbidity.

**Implications of the review for practice and research**
Further post-operative nausea and vomiting may be stopped in around 25% of patients.

**Bibliographic details**

PubMedID
9133892

Original Paper URL
http://www.bmj.com/content/314/7087/1088

Indexing Status
Subject indexing assigned by NLM

MeSH
Antiemetics /therapeutic use; Dose-Response Relationship, Drug; Humans; Nausea /prevention & control; Ondansetron /therapeutic use; Postoperative Complications /prevention & control; Randomized Controlled Trials as Topic /standards; Treatment Outcome; Vomiting /prevention & control

AccessionNumber
11997008098

Date bibliographic record published
31/07/1997

Date abstract record published
31/07/1997

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.