Meta-analytic comparison of prophylactic antiemetic efficacy for postoperative nausea and vomiting: propofol anaesthesia vs omitting nitrous oxide vs total i.v. anaesthesia with propofol

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Authors' objectives
To compare the incidence of post-operative nausea and vomiting (PONV) within three different anaesthetic regimens.

Searching
MEDLINE was searched from 1966 to 1995. Reference lists and review articles were also scanned. Only published articles were sought, but there were no language restrictions (see Other Publications of Related Interest).

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs). Data were taken from 3 sources: a published meta-analysis comparing propofol maintenance with another anaesthetic, a reworking of a published meta-analysis of anaesthetics without nitrous oxide compared with the same anaesthetic with nitrous oxide; and a new meta-analysis of RCTs comparing the antiemetic efficacy of total i.v. anaesthesia with propofol with another anaesthetic with nitrous oxide.

Specific interventions included in the review
Propofol maintenance, anaesthetic omitting nitrous oxide, total intravenous anaesthesia with propofol (i.e. propofol anaesthesia without nitrous oxide).

Participants included in the review
The authors do not provide details of the participants.

Outcomes assessed in the review
PONV, distinguishing early (0 to 6 hours) and late (0 to 48 hours) PONV, was assessed.

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 authors do not state that they assessed validity.

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?
Data from the studies were used to construct a series of graphs (L’Abbe plots) showing emetic event rates with interventions in relation to event rates with controls. For each condition, odds ratios and the number of patients that needed to be treated to prevent an event (NNT) were calculated, with 95% confidence intervals. Comparisons were made for both early and late outcomes.
How were differences between studies investigated?
The L’Abbe plots used to combine the results of studies also reveal differences between them.

**Results of the review**
Nine studies were included in the total i.v. anaesthetic meta-analysis. Other meta-analyses are described elsewhere (see Other Publications of Related Interest).

All interventions assessed appear to reduce early (<6 hours) post-operative nausea and vomiting. Control conditions showed 20-60% early and 40-80% late emetic event rates.

For early emetic events, Propofol anaesthesia decreased the incidence of nausea and vomiting: NNT (nausea and vomiting) = 4.9; 95% CI: 3.7 to 7.1.

Omitting nitrous oxide decreased vomiting but not nausea: NNT (nausea) =9.1; 95% CI: 4.1 to 16; NNT (vomiting) = 4.8; 95% CI: 3.6 to 7.3.

Total i.v. anaesthesia with propofol also appeared effective for reducing early events, but these studies were small and poorly-reported. NNT (nausea) = 5.6; 95% CI: 3.4 to 16; NNT (vomiting) = 3.3; 95% CI: 2.3 to 5.4.

The 95% confidence intervals of the NNT for all these interventions overlapped: there was no significant difference between them.

Both propofol maintenance and omitting nitrous oxide reduced late vomiting, with NNTs of 6.3 (95% CI: 3.6 to 27) and 5.6 (95% CI: 3.9 to 10) respectively. Propofol also reduced late nausea: NNT =2.8; 95% CI 1.8 to 6.8, but again, omitting nitrous oxide did not affect nausea. The data on total i.v. anaesthesia were insufficient to permit any conclusions to be drawn on late efficacy.

**Authors’ conclusions**
A propofol maintenance anaesthetic and omitting nitrous oxide in general anaesthesia had approximately the same effect on early and late post-operative vomiting. Propofol (but not omitting nitrous oxide) also decreased the incidence of nausea. The present evidence is insufficient to recommend total i.v. anaesthesia with propofol.

**CRD commentary**
This paper should be read in conjunction with others in the series (see Other Publications of Related Interest). It appears that the only database searched was MEDLINE, so some studies (particularly those published in mainland Europe) may have been missed; the possible importance of such studies is not known. In other respects, this seems to be a reliable review.

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