Critical Review Form

Meta-analysis

Antiemetics for Reducing Vomiting Related to Acute Gastroenteritis in Children and Adolescents. Cochrane Database of Systematic Reviews 2006. Issue 4. Article No.: CD005506, DOI 10.1002/14651858.CD005506.pub3

Objective: **To provide reliable evidence regarding the clinical effectiveness and safety of anti-emetics prescribed for vomiting due to gastroenteritis by comparing clinical outcomes expressed as cessation of vomiting and the eventual resumption of oral rehydration therapy (p. 3).**

Methods: **Systematic review of CENTRAL, MEDLINE and EMBASE using predefined Cochrane highly sensitive search strategies. The authors also performed a hand-search of identified trials' reference lists and published abstracts from the journals *Gut* and *Gastroenterology* in addition to contacting members of Cochrane's Upper GI and Pancreatic Diseases group to provide details of ongoing trials. Two reviewers independently evaluated abstracts and methodological quality based upon: randomization, allocation concealment, outcome assessor blinding, and handling of withdrawals/loss-to-follow up. Due to significant clinical heterogeneity and the paucity of data, no meta-analysis or sensitivity analysis was conducted. The primary outcome measure sought was time to cessation of vomiting. Unfortunately, this outcome measure was not assessed in any of the identified trials.**

Guide	Question	Comments
I	***Are the results valid?***	
1.	Did the review explicitly address a sensible question?	Yes, is there a benefit to anti-emetic therapy in children or adolescents? The question stems from the American Academy of Pediatrics' 1996 statement advising against anti-emetic use with scant supporting evidence for or against their use (*Pediatrics* 1996; 97: 424-435).
2.	Was the search for relevant studies details and exhaustive?	Yes. As detailed on p 4, the search included multiple electronic databases, clearly stated search terms following the Cochrane Reviewers' Handbook, and was supplemented by hand-searches of relevant journals and contacting content experts.

3.	Were the primary studies of high methodological quality?	Yes. Although deficiencies were well detailed.

4.	Were the assessments of the included studies reproducible?	Yes. Methods of study identification data abstraction, and grading quality are all well-described and "easily" reproducible.
II.	***What are the results?***	
1.	What are the overall results of the study?	The results section, unfortunately, is not a meta-analysis, but rather a non-quantitative Systematic Review of the identified literature. We've already reviewed two of these papers during this Journal Club so refer to the respective Washington University Critical Appraisal Forms for full details. In total, the authors identified 2443 potentially relevant references, narrowed their search to 6 for full review and subsequently included only 3 in this Systematic Review. • **Ramsook** 2002 (PGY I) - ↓ IVF and ↓ admission, ↑ diarrhea and re-visit favoring the ondansetron group. • **Cubedda*** 1997 **Proportion Reporting No Vomiting** **At Time** / **Ondansetron** / **Metaclopramide** / **Placebo** 4° / 92% / 83% / 67% 24° / 58% / 33% / 17% • Only 12 per treatment arm. All subjects were admitted for 24-hours of IV treatment. • **Freedman** 2006 (PGY II) – NNT 5 to prevent any post-treatment vomiting and NNT 6 to avoid IV placement. ED LOS decreased in ondansetron-arm from 120-minutes to 106-minutes. No CI crossed unity.
2.	How precise are the results?	No Confidence Intervals are reported in the Cochrane Review.
3.	Were the results similar from study to study?	Yes. All favor ondansetron. All trials identified were industry sponsored suggesting possibility of *commercial bias* or *publication bias*.

III.	***Will the results help me in caring for my patients?***	
1.	How can I best interpret the results to apply them to the care of my patients?	In contrast to the evidence-deprived 1996 AAP statement (which may have been aimed at inappropriate use of older anti-emetics with worse side-effect profiles), weak evidence suggests that oral or intravenous ondansetron or intravenous metaclopramide may reduce vomiting at 1-7 days.

2.	Were all patient important outcomes considered?	No. Time to cessation of vomiting, parental satisfaction and side-effect profiles were not assessed.
3.	Are the benefits worth the costs and potential risks?	Most definitely, particularly in developing countries where access to health care settings and intravenous therapy are limited and the disease burden of gastroenteritis is excessive (higher prevalence, higher mortality).

Limitations

A scant number of small heterogeneous trials from which to draw conclusions.

Bottom Line

In contrast to the AAP 1996 consensus opinion, three small, industry-sponsored, randomized trials all suggest that ondansetron (PO or IV) or IV metaclopramide reduce vomiting acutely and up to 7d in vomiting children (up to age 18). Most note a clinically insignificant increase in diarrhea with the use of antiemetics. Future trials should assess the time to vomiting cessation, parental satisfaction, role of intravenous versus oral dosing, pediatric side-effect profile, and cost-effectiveness