ANTIEMETICS FOR VOMITING SECONDARY TO GASTROENTERITIS IN CHILDREN

CLINICAL TOPIC REVIEW

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Declaration: This is my own work and there has been no plagiarism.

Contents

Introduction

Gastroenteritis is a common childhood illness, the American Academy of Pediatrics defines gastroenteritis as "diarrhoeal disease of rapid onset, with or without accompanying symptoms or signs such as nausea, vomiting, fever, or abdominal pain"[1]. Worldwide, about 1.5 million children under 5 die of acute gastroenteritis each year[2]. In the United Kingdom, 204 of every 1000 consultations with general practitioners in children under 5 are for gastroenteritis, and the annual hospital admission rate in this group is about seven per 1000 children[3]. Gastroenteritis forms a significant workload for emergency departments. A study in Nottingham showed that 38 982 children presented to their paediatric emergency department over a year, 617 (16%) were diagnosed as having gastroenteritis[4].

Morbidity and mortality are primarily due to water and electrolyte loss. The key treatment of gastroenteritis is prevention and correction of dehydration. Oral rehydration therapy is the preferred method of treatment for mild to moderate dehydration[1-3]. The failure rate of ORT according to a Cochrane review[5] in 2006 was 4 %, they compared oral versus intravenous rehydration and found that for every 25 children treated with ORT one would fail and require intravenous rehydration. The main reasons for failure of ORT [2] being:

-continuing rapid stool loss;

-insufficient intake of ORS solution owing to fatigue or lethargy;

-frequent, severe vomiting.

Antiemetics are routinely used in children having chemotherapy and also to prevent postoperative nausea. However the guidance regarding gastroenteritis has been that antiemetics should not be used[1,2]. The reasons stated for not recommending antiemetics include adverse effects, distraction from the main therapeutic intervention i.e. ORT, self limiting nature of vomiting, possible masking of a more sinister diagnosis and finally altering the course of disease.

In the US antiemetic use for gastroenteritis is common, in one survey of emergency physicians and paediatricians 60.9% of responders reported using antiemetics for gastroenteritis[6].

From my experience, the most common reason for admission of children with gastroenteritis is because of their inability to tolerate oral rehydration, usually due to vomiting. Are antiemetics therefore a useful adjunct to oral rehydration in patients with gastroenteritis who have persistent vomiting.

AIMS

The aims of this clinical topic review is twofold

1. To explore and appraise the current evidence for the use of antiemetics in children diagnosed with gastroenteritis. The main outcomes I am interested in are cessation of vomiting, need for intravenous rehydration, hospitalisation, reattendances and adverse effects.
2. To assess the perceptions of emergency physicians and paediatricians regarding the use of antiemetics for gastroenteritis.

Method

I used original clinical trials, meta-analysis papers and systematic reviews for the purpose of this review; a comprehensive literature search was carried out as detailed below.

1. A literature search was performed using the search terms as mentioned in appendix A, via the Dialog Data star interface in the following databases.

- MEDLINE - 1950 to date (MEZZ)
- King's Fund - 1979 to date (KFND)
- EMBASE - 1974 to date (EMZZ)

- DH-DATA - 1983 to date (DHSS)
- CINAHL (R) - 1982 to date (NAHL)
- British Nursing Index - 1994 to date (BNID)

2. The Cochrane library was searched using the relevant search terms
3. Evidence based reviews – Bandolier, DARE, NHS EED, HTA, and ReFeR.
4. Google scholar
5. References cited within the selected papers

Unpublished and ongoing trials were looked for in the International Clinical Trials Registry Platform (*http://www.who.int/ictrp/en/*), Meta register of clinical trials (mRCT), The National Research Register (*http://www.controlled-trials.com*), and *http://www.clinicaltrials.gov/* .

The above search strategy identified six randomised controlled trials, one non randomised placebo controlled trial, one proceedings from a conference, one meta-analysis and a Cochrane review[7]. There were two trials in progress both comparing dimenhydrinate with placebo, one using oral and the other, suppositories.

I have used the controlled trials and meta-analysis for the purpose of this review. The Cochrane review was not included. It gives a descriptive summary of three RCT's[8-10]; since it was published there have been further RCT's[11,12] and a meta-analysis[13] . I wanted to assess the evidence from the trials and draw my own conclusions.

Two further trials[14,15] were reviewed, as they were of poor methodological quality, and did not look at the outcomes stated in the aims. I have not included them in my review.

RESULTS

The meta-analysis is described below, rest of the studies are presented in a BestBet style table.

The meta-analysis by Szajewska *et al* [13] which included four RCT's[8-10,16] involving 490 subjects in total looked at the effect of ondansetron in treating vomiting during gastroenteritis. The results from the meta-analysis are in the table below.

Outcome	**Number of RCTs** *(heterogeneity)*	**Intervention /control**	**Result** *(95% CI)*
Cessation of vomiting in ED or during ORT	3 *(I^2=0%)*	253/231	RR1.3 *(CI 1.2-1.5)* NNT 5 *(CI 4-5)*
Cessation of vomiting in 24 h	2 *(I^2 = 66%)*	76/68	RR 1.2 *(CI 0.9-1.7)* NS
Intravenous rehydration	2 *(I^2= 0%)*	181/178	RR0.4 *(CI .3-.7)* NNT 7 *(CI 5-14)*
Hospitalization	3 *(I^2=52%)*	235/231	RR 0.6 *(CI 0.4-1.01)* NS
Return visit to ED	3 *(no data)*	235/227	RR1.3 *(CI 0.8-2.2)* NS

The included studies were heterogenic in nature with regards to inclusion criteria and interventions. The Reeves[16] study included in the meta-analysis was excluded by the Cochrane review, as it had subjects up to the age of 22 years. The authors did not look at possible publication bias. It is difficult to assess the pooled results of outcomes such as hospitalization and IV rehydration as there were no agreed definitions for these endpoints among the studies.

The rest of the relevant clinical trials are presented in a BestBet style table in the following pages, I have assessed their quality by assigning a Jadad [17]score to each study.