FPIN's Clinical Inquiries

Antiemetics for Acute Gastroenteritis in Children

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Clinical Question

What is the best antiemetic for vomiting in children with acute gastroenteritis?

Evidence-Based Answer

Oral ondansetron (Zofran) may be given to children presenting to the emergency department with vomiting and mild to moderate dehydration from acute gastroenteritis. It reduces hospital admissions and the need for intravenous hydration. (Strength of Recommendation: A, based on a meta-analysis of moderate-quality randomized controlled trials [RCTs] and a subsequent RCT.)

Evidence Summary

Two systematic reviews[1,2] and an RCT[3] evaluating oral ondansetron in children with vomiting from acute gastroenteritis in the emergency department setting found that it improved multiple outcomes. Children diagnosed with mild to moderate dehydration (n = 465) received ondansetron at varying dosages based on weight. Ondansetron reduced hospital admissions (relative risk [RR] = 0.4; 95% CI, 0.19 to 0.87) and the need for intravenous hydration (RR = 0.41; 95% CI, 0.29 to 0.59), and it decreased the failure rate of oral hydration. Those who received ondansetron were more likely to stop vomiting (RR = 1.33; 95% CI, 1.19 to 1.49) but were not less likely to return for further care. The studies were rated as moderate quality. Three studies included in one of the systematic reviews[1] reported significantly increased diarrhea in children taking ondansetron ($P < .05$), but they did not quantify the difference between the treatment and placebo groups. A subsequent RCT (N = 176) found that ondansetron use led to significantly fewer failures of oral rehydration (12 of 82 children receiving ondansetron vs. 24 of 83 children receiving placebo; $P = .04$).[3]

A systematic review of RCTs comparing antiemetics with placebo in children presenting to the emergency department with acute gastroenteritis found some benefit from dimenhydrinate rectal suppositories and oral granisetron (Kytril).[4] One of the RCTs (n = 208) found that dimenhydrinate slightly reduced days of continued vomiting (0.34 fewer days; 95% CI, −0.66 to −0.02; $P = .036$). Another RCT (n = 159) found that children treated with oral granisetron had less vomiting at 24 hours (92.5% vs. 79.7%; $P = .02$), but there was no difference at 48 or 72 hours. There was no benefit from treatment with intravenous metoclopramide (one RCT; n = 24) or intravenous dexamethasone (one RCT; n = 85). A mixed-treatment comparison determined that ondansetron was the most effective agent for reducing vomiting (odds ratio = 4.54; 95% CI, 2.45 to 8.44; $P < .01$).

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An RCT comparing dimenhydrinate with placebo in hospitalized children with acute gastroenteritis (N = 200) found no difference in the number of vomiting episodes.[5] Another RCT comparing ondansetron, domperidone (not approved by the U.S. Food and Drug Administration [FDA] but available through the FDA's expanded access program), and placebo in children with acute gastroenteritis in the emergency department setting (N = 356) found that both agents reduced the need for intravenous rehydration (ondansetron RR = 0.41; 98.6% CI, 0.20 to 0.83; domperidone RR = 0.48; 98.6% CI, 0.31 to 0.74).[6]

Recommendations from Others

Guidelines from the European Society for Paediatric Gastroenterology Hepatology and Nutrition and the European Society for Paediatric Infectious Diseases state that ondansetron may be effective in young children with vomiting related to acute gastroenteritis, but that more information is needed about its safety in this population.[7] Guidelines from the Federation of International Societies of Paediatric Gastroenterology, Hepatology and Nutrition state that ondansetron is effective in reducing vomiting and may help avoid hospital admission, but it is associated with QT prolongation and severe cardiac arrhythmias and carries warnings by the FDA and the European Medicines Agency.[8] The groups recommended against the use of metoclopramide because of adverse effects and against the use of domperidone because it is ineffective.

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References

1. Fedorowicz Z, Jagannath VA, Carter B. Antiemetics for reducing vomiting related to acute gastroenteritis in children and adolescents. *Cochrane Database Syst Rev.* 2011;(9):CD005506.
2. Tomasik E, Ziólkowska E, Kolodziej M, et al. Systematic review with meta-analysis: ondansetron for vomiting in children with acute gastroenteritis. *Aliment Pharmacol Ther.* 2016;44(5):438-446.
3. Golshekan K, Badeli H, Rezaieian S, et al. Effect of oral ondansetron on decreasing the vomiting associated with acute gastroenteritis in Iranian children. *Iran J Pediatr.* 2013; 23(5):557-563.
4. Carter B, Fedorowicz Z. Antiemetic treatment for acute gastroenteritis in children: an updated Cochrane systematic review with meta-analysis and mixed treatment comparison in a Bayesian framework. *BMJ Open.* 2012;2(4):e000622.
5. Gheini S, Ameli S, Hoseini J. Effect of oral dimenhydrinate in children with acute gastroenteritis. *Oman Med J.* 2016;31(1):18-21.
6. Marchetti F, Bonati M, Maestro A, et al.; SONDO Investigators. Oral ondansetron versus domperidone for acute gastroenteritis in pediatric emergency departments. *PLoS One.* 2016;11(11):e0165441.
7. Guarino A, Ashkenazi S, Gendrel D, et al. European Society for Paediatric Gastroenterology Hepatology and Nutrition/ European Society for Paediatric Infectious Diseases evidence-based guidelines for the management of acute gastroenteritis in children in Europe. *J Pediatr Gastroenterol Nutr.* 2014;59(1):132-152.
8. Guarino A, Lo Vecchio A, Dias JA, et al. Universal recommendations for the management of acute diarrhea in nonmalnourished children. *J Pediatr Gastroenterol Nutr.* 2018; 67(5):586-593. ■