Research Brief

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Comparative efficacy of serotonin (5-HT3) receptor antagonists in patients undergoing surgery: a systematic review and network meta-analysis

Summary

We conducted a systematic review to examine the comparative efficacy of 5-HT3 receptor antagonists in patients undergoing surgical procedures. Overall, 450 studies and 80,410 patients were included. Administration of most 5-HT3 antagonists led to significantly fewer patients experiencing nausea, vomiting, and post-operative nausea and vomiting relative to placebo. For all age groups and across all outcomes, the most effective agents were granisetron plus dexamethasone. For adults, the most effective agents were ondansetron plus droperidol IV; and for children, the most effective agents were ondansetron plus dexamethasone.

Implications

Using network meta-analysis, we found that granisetron plus dexamethasone was often the most effective antiemetic with the number needed to treat ranging from two to nine. A future study that examines the administration of 5-HT3 receptor antagonists at different dosages would provide clarity regarding the issue of the effect(s) of different drug doses and durations and our team is currently working on this initiative.

Reference: Tricco AC, Soobiah C, Blondal E, et al. Comparative efficacy of serotonin (5-HT3) receptor antagonists in patients undergoing surgery: a systematic review and network meta-analysis. BMC Med. 2015;13:136.

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What is the current situation?

- Serotonin (5-HT3) receptor antagonists are commonly used to decrease nausea and vomiting for patients undergoing surgery
- The aim of this review was to conduct a systematic review and network meta-analysis (NMA) to assess the comparative efficacy of 5-HT3 receptor antagonists

How was the review conducted?

- Multiple electronic databases, trial protocol registries and conference proceedings were searched
- The protocol (or plan) for the review was registered and published
- Eligible study designs included randomized clinical trials (RCTs) and nonrandomized studies examining 5-HT3 receptor antagonists (granisetron, ondansetron, dolasetron, tropisetron and ramosetron) vs. placebo in patients of all ages undergoing surgery
- Outcomes of interest included: number of patients who vomited, number of patients with nausea and the number of patients with both postoperative nausea and vomiting
- Screening of literature search results, data abstraction, and risk-of-bias assessment were conducted independently by two reviewers
- Random-effects pairwise meta-analysis and network meta-analysis (NMA) were conducted

What did the review find?

- 450 relevant studies were included
- Significantly fewer patients experienced nausea with any drug relative to placebo, except for ondansetron plus metoclopramide in a NMA including 195 RCTs and 24,230 patients
- Significantly fewer patients experienced vomiting with any drug relative to placebo except for palonosetron plus dexamethasone in NMA including 238 RCTs and 12,781 patients
- All agents resulted in significantly fewer patients with postoperative nausea and vomiting versus placebo in a NMA including 125 RCTs and 16,667 patients

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