

DSEN Abstract

Comparative safety 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 safety and effectiveness of 5-HT₃ antagonists in patients undergoing surgical procedures. Using network meta-analysis we found that significantly more patients receiving granisetron and dexamethasone experienced arrhythmia. No other significant safety signals were identified. All agents were significantly more effective in reducing post-operative nausea and vomiting compared to placebo.

Implications

Overall, granisetron was found to carry the highest risk of arrhythmia of any of the 5-HT₃ antagonists assessed. Though no significant safety effects were found for other outcomes, a lack of consistent harm reporting among the included studies was noted. Further research in the use of 5HT-3 antagonists for surgical patients should focus on harm reporting as well as effectiveness.

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What is the current practice in treating nausea and vomiting in patients undergoing surgery?

- Serotonin (5-HT₃) receptor antagonists are commonly used to decrease nausea and vomiting for patients undergoing surgery
- Some evidence exists, which shows that 5-HT₃ receptor antagonists may also cause harm such as arrhythmia
- The aim of this review was to conduct a systematic review and network meta-analysis (NMA) to determine the effectiveness and safety of 5-HT₃ receptor antagonists

How was the study conducted?

- Eligible study designs included randomized clinical trials (RCTs) and non-randomized studies examining 5-HT₃ antagonists (granisetron, ondansetron, dolasetron, tropisetron) vs. placebo in patients of all ages undergoing surgery
- The outcomes of interest included arrhythmia, QT prolongation, PR prolongation, mortality, nausea, vomiting, and post-operative nausea and vomiting
- Screening of literature search results, data abstraction, and risk-of-bias assessment were conducted independently by two reviewers
- The protocol (or plan) for the review was registered and published
- Network meta-analysis was conducted

What did the study find?

- 452 relevant studies were included
- A NMA (31 RCTs) was conducted to examine arrhythmia outcomes and 2 meta-analyses were conducted to examine mortality (3 RCTs) and QT prolongation (2 RCTs)
- 3 NMAs were conducted to examine nausea (195 RCTs), vomiting (238 RCTs), and post-operative vomiting and nausea (125 RCTs)
- Significantly more patients receiving granisetron plus dexamethasone experienced arrhythmia compared to all other interventions and placebo
- No statistically significant differences were observed regarding mortality and QT prolongation in meta-analysis; no studies reported on PR prolongation or sudden cardiac death
- Significantly fewer patients experienced nausea and vomiting when administered any drug versus placebo except for ondansetron plus metoclopramide (nausea) and palonosetron plus dexamethasone (vomiting)
- Significantly fewer patients experienced post-operative nausea and vomiting when administered any drug versus placebo

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