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ORIGINAL ARTICLE

Dexamethasone combined with other antiemetics for prophylaxis after laparoscopic cholecystectomy

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dexamethasone;
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Summary *Background/Objective:* Postoperative nausea and vomiting (PONV) is one of the most common and distressing adverse events after laparoscopic cholecystectomy (LC). A meta-analysis of randomized clinical trials (RCTs) was performed to determine the efficacy and safety of dexamethasone combined with other antiemetic in the prevention of PONV in patients undergoing LC.
Methods: A systematic literature search was conducted to identify all relevant RCTs. The primary outcome was PONV in the early period (0–3 hours, 0–4 hours, or 0–6 hours), late period (>6 hours), and the overall period (0–24 hours).
Results: Nine RCTs with a total of 1089 patients were included in the analysis. Pooled analysis showed that dexamethasone combined with other antiemetics provided significantly better prophylaxis than single antiemetics in the early period [odds ratio (OR): 0.34; 95% confidence interval (CI): 0.21–0.55; $p < 0.001$], late period (OR: 0.35; 95% CI: 0.22–0.57; $p < 0.001$), and the overall period (OR: 0.36; 95% CI: 0.27–0.49; $p < 0.001$). Correspondingly, rescue antiemetic usage was significantly less in the combination therapy group (OR: 0.22; 95% CI: 0.12–0.41; $p < 0.001$). The most frequently reported adverse events were headache, dizziness, and itching. The incidence of adverse events did not differ between the two groups.
Conclusion: Dexamethasone combined with other antiemetics was significantly better than single antiemetics for prophylaxis of PONV in patients undergoing LC, without apparent side effects.

Conflicts of interest: The authors declare that they have no potential competing interests.

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1. Introduction

Postoperative nausea and vomiting (PONV) is one of the most common and distressing adverse events after laparoscopic cholecystectomy (LC).[1] Dexamethasone, a corticosteroid, can effectively prevent PONV.[2] To improve antiemetic efficacy, clinicians often add another agent to the monotherapy.[3] Although there have been several randomized controlled trials (RCTs) evaluating efficacy of the combination of dexamethasone with other antiemetics for the prevention of PONV in patients undergoing LC, the number of patients in the individual trial is often small.[4–8] In such settings, the use of a meta-analysis has been advocated to obtain a more precise estimate of effect size.[9]

Therefore, we performed a meta-analysis to evaluate the available evidence regarding the antiemetic efficacy of dexamethasone combined with other antiemetics for PONV compared with single antiemetics in patients undergoing LC. This study was undertaken following the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.

2. Materials and methods

2.1. Literature search

A computerized search of Medline and Embase databases as well as the Cochrane Library was performed. The following MeSH search headings were used: "laparoscopic cholecystectomy", "dexamethasone", "nausea", "vomiting", "postoperative", and "postoperative nausea and vomiting". Reference lists in the selected articles were manually searched for additional studies. The electronic search was performed from 1 January 1966 to 30 October 2012.

2.2. Inclusion and exclusion criteria

All studies published as full reports of RCTs in the English language that evaluated the efficacy of prophylactic dexamethasone combined with other antiemetics compared with single antiemetics on PONV in patients undergoing LC were included. Abstracts, reviews, letters to the editor, retrospective studies, and animal data were excluded. No attempts were made to obtain unpublished studies.

2.3. Data extraction

Two reviewers (BL and LW) independently extracted the following parameters from each study: first author, year of publication, study population characteristics, study design, number of patients in each arm, sex, age, inclusion and exclusion criteria, and outcomes of interest. The incidence of PONV was extracted at three time points: early period (0–3 hours, 0–4 hours, or 0–6 hours), late period (>6 h), and overall period (0–24 hours). If the incidence of events in the overall period was not reported in a study, we extracted data from the time points with the highest event rate. Discrepancies between the reviewers were resolved through discussion until consensus was achieved.

2.4. Qualitative analysis

The RCTs were scored using the Jadad scale,[10] which evaluates studies based on randomization (0–2 points), double-blinding (0–2 points), and withdrawals and dropouts (0–1 point). Studies achieving $\geq$3 points were considered to be of higher quality.

2.5. Outcomes of interest

The primary outcome was PONV, which included both nausea and vomiting.

Secondary outcomes were adverse effects and rescue antiemetic usage.

2.6. Statistical analysis

Dichotomous variables were summarized using odds ratio (OR) with a 95% confidence interval (CI). For each comparison, heterogeneity was evaluated by χ^2 and I^2. If the statistical test for heterogeneity was present ($p < 0.1$), a random effects model was used. If the data were not significantly heterogeneous ($p > 0.1$), a fixed effects model was used. Publication bias was assessed visually using a funnel plot. All data were analyzed using Review Manager version 5.0 (Cochrane Collaboration, Software Update, Oxford, UK) and $p < 0.05$ was considered statistically significant.

3. Results

3.1. Eligible studies

From the electronic databases, we initially identified 10 RCTs that met the eligibility criteria. One study was excluded because it presented PONV as continuous data,[8] so a final total of nine studies published between 2000 and 2012 was included in the present analysis.[4–7,11–15] The study characteristics and patient demographic data are shown in Tables 1 and 2. Sample size ranged from 80 to 150, with a total of 1089 patients, of whom 526 received prophylactic dexamethasone plus other antiemetics (combination therapy group) and 563 received a single antiemetic (monotherapy group). All of the studies had higher quality. There were no significant demographic differences between patients randomized to the combination therapy group versus the monotherapy group in all the trials.

3.2. Results of meta-analysis

Results of the meta-analysis are presented in Table 3. Pooled analyses showed that combination therapy provided significantly better prophylaxis against PONV after LC than the monotherapy group in the early period (OR: 0.34; 95% CI: 0.21–0.55; $p < 0.001$; Fig. 1), late period (OR: 0.35; 95% CI: 0.22–0.57; $p < 0.001$; Fig. 2), and overall period (OR: 0.36; 95% CI: 0.27–0.49; $p < 0.001$; Fig. 3). Correspondingly, rescue antiemetic usage was significantly less in the combination therapy group (OR: 0.22; 95% CI: 0.12–0.41; $p < 0.001$). The most frequently reported adverse events were headache, dizziness, and itching. The incidence of adverse events did not differ between the two groups.