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Original Contribution

Dexamethasone for the prevention of postoperative sore throat: a systematic review and meta-analysis☆,☆☆

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Abstract

Study Objective: To determine the antiemetic efficacy of dexamethasone in the prevention of postoperative sore throat (POST) and postoperative hoarseness (PH).

Design: Meta-analysis.

Setting: Metropolitan university medical center.

Measurements: This systematic review and meta-analysis was conducted and reported in agreement with the PRISMA guideline. We searched online databases of MEDLINE (from 1966 to August 2013), EMBASE (from 1982 to August 2013), Google Scholar, and the Cochrane Database of Systematic Review. Relative ratios (RRs) and 95% confidence interval (CI) were calculated.

Results: : Four trials with a total of 480 patients were included for the analysis: 283 received prophylactic dexamethasone and 197 received placebo. Pooled result by random-effects model showed that dexamethasone significantly decreased the incidence of POST at 1 hour (RR = 0.51, 95% CI 0.27-0.94, $P = .03$; P for heterogeneity = .0005, $I^2 = 83\%$) and at 24 hour postextubation (RR = 0.46, 95% CI 0.26-0.79, $P < .05$; P for heterogeneity = .01, $I^2 = 72\%$). Our analysis indicated that dexamethasone significantly decreased the incidence of PH at 1 hour (RR = 0.22, 95% CI 0.11-0.46, $P < .01$; P for heterogeneity = .48, $I^2 = 0\%$), but did not affect the incidence of PH at 24 hours postextubation (RR = 0.67, 95% CI 0.37-1.20, $P > .1$; P for heterogeneity = .12, $I^2 = 59\%$).

Conclusion: Our meta-analysis suggested that intravenous dexamethasone can effectively reduce the incidence of POST both at 1 and at 24 hours postextubation. In addition, the present study showed that prophylactic dexamethasone reduced the incidence of PH at 1 hours but not at 24 hours postextubation.

1. Introduction

Postoperative sore throat (POST) is a common occurrence after general anesthesia with endotracheal intubation, with the incidence ranging from 6.6% to 90% [1,2]. Incidence of POST depends on various factors such as female sex, history

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of smoking or lung diseases, postoperative nausea [3], the size of the endotracheal tube, the cuff pressure, and the time and manipulations needed to insert the tube [1]. The common methods for the prevention of POST include use of a smaller endotracheal tube to reduce contact area with mucosa [4,5], low intracuff pressure [6], cuff filled with saline or lidocaine [7,8], and inhalation of steroid[9].

Dexamethasone is a potent corticosteroid with analgesic, anti-inflammatory, and antiemetic effects [10–12]. Recent studies indicated that dexamethasone may be an effective method for the prevention of POST. However, reports from the literature were confusing and inconsistent. Bagchi et al [13] showed that prophylactic intravenous dexamethasone reduces the incidence of POST at 1 hour postextubation by 30%, with the efficacy being 60%, whereas Ruangsin et al [14] reported that the intravenous dexamethasone had no significant effect against POST after endotrachea intubation. Therefore, the preventive effect of dexamethasone has not been clearly defined. The aim of this systematic review and meta-analysis was to determine the anti-inflammatory efficacy of dexamethasone in the prevention of POST.

2. Materials and methods

2.1. Systematic search

This systematic review and meta-analysis was conducted and reported in agreement with the PRISMA guideline [15].

Online databases of MEDLINE (from1966 to August 2013), EMBASE (from 1982 to August 2013), Google Scholar, and the Cochrane Database of Systematic Review were searched; words and medical subheadings of "dexamethasone" and "sore throat" were used for databases searching. References from relevant articles were reviewed to identify additional studies. Although no language restriction was used, all studies included in this systematic review were published in English. The initial research yielded 55 randomized clinical trials (RCTs).

2.2. Study selection

Two reviewers selected eligible RCTs independently. After a primary screening of titles and abstracts, full-text articles of potentially relevant RCTs were retrieved and further evaluation of eligibility. Fifty-one trials were not relevant based on inclusion and exclusion criteria. Disagreements between 2 authors were resolved by discussion with a third author.

2.3. Inclusion and exclusion criteria

Randomized controlled trials met the following criteria: (1) intervention: perioperative intravenous dexamethasone, (2) population: patients undergoing general anesthesia after endotracheal intubation, and (3) outcome: incidence of POST or postoperative hoarseness (PH). Excluded were trials reporting dexamethasone administration without an active (placebo or "no treatment") control group or patients with no endotracheal intubation.

2.4. Assessment of study quality

Two authors independently read the included RCTs and assessed their methodological validity using a modified Jadad five-point quality scale [16]. The scale evaluates the study for the following items: randomization, double-blind evaluation, concealment of study group to evaluator, valid randomization method, and completeness of data at follow-up. The minimum possible score of an included trial was 1 and the maximum was 5.

2.5. Date extraction

Data were abstracted independently by using a standardized data collection form. Data included dexamethasone dose, ample size, number of subjects in treatment groups, type of surgery, and POST and/or PH at 1 and/or 24 hours. The primary outcome of the data was the incidence of POST at 1 and at 24 hours after surgery. The secondary outcomes were the incidence of PH at 1 and at 24 hours.

2.6. Statistical analysis

For dichotomous data, relative ratios (RRs) and 95% confidence interval (CI) were calculated. The heterogeneity of the included studies was considered significant, if the P value of χ^2 test was less than .10 or I^2 greater than 50%, and then a random-effects model was used; otherwise, a fixed-effects model was used. Further analysis was planned a priori to explore relevant heterogeneity. Subgroup analysis was performed comparing a single-does dexamethasone with multiple-dose dexamethasone group in studies. Sensitivity analysis was performed by omitting one study each time and investigating the influence of a single study on the overall pooled estimate. Publication bias was assessed by visually inspecting funnel plots if at least 10 trials of each intervention were included. However, we were not able to create funnel plots because of the trials in our meta-analysis were small. A P value less than .05 was considered statistically significant. All statistical analyses were performed using Review Manager Version 5.1 (RevMan5.1; The Cochrane Collaboration, Oxford, United Kingdom).

3. Results

3.1. Identification and selection of study

The comprehensive search yielded a total of 55 records, and 9 studies initially met the inclusion criteria (Fig. 1) [13,14,17–