

COMPARATIVE ANALYSIS OF EFFICACY OF EQUAL DOSE OF DEXAMETHASONE IN PREVENTING POSTOPERATIVE SORE THROAT (POST) VIA THREE DIFFERENT ROUTES I.E. INTRAVENOUS, TOPICAL AND NEBULIZATION BEFORE SURGERY AT A TERTARY CARE HOSPITAL

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Abstract

Background: Sore throat is a common postoperative complaint, occurring most often following tracheal intubation. Dexamethasone has a wide variety of uses in the medical field. Hence; the present study was conducted for comparing the efficacy of equal dose of dexamethasone in preventing POST (postoperative sore throat) via three different routes .i.e. intravenous, topical and nebulization before surgery. **Materials & Methods:** A total of 150 patients were enrolled in the present study. The patients were assessed a day prior to surgery for pre-anesthetic checkup. All the patients were randomized into three study groups as follows: Group 1: Patients nebulized with dexamethasone (8 mg in 6 ml), Group 2: Patients in which dexamethasone (8 mg in 6 ml) was given intravenously, and Group 3: Patients which nebulized with normal saline (6 ml) along with topical dexamethasone. Patients were assessed for POST and hoarseness in postoperative period after 24 h. All the results were recorded on a Microsoft excel sheet followed by statistical analysis using SPSS software. **Results:** Mean age of the patients of group 1, group 2 and group 3 was 41.3 years, 42.5 years and 42.9 years respectively. Among group 1, POST was seen in 10 patients while in Group 2 and group 3, POST was seen in 14 patients and 15 patients respectively. Non-significant results were obtained while comparing the incidence of POST among patients of all the three study groups. **Conclusion:** Dexamethasone when given through nebulization route was found to be most efficacious in reducing POST.

INTRODUCTION

Sore throat is a common postoperative complaint, occurring most often following tracheal intubation. Factors such as tracheal-tube size and cuff design have been shown to be important causative factors. Routine tracheal intubation for elective surgical procedures can result in pathological changes, trauma and nerve damage which may also account for postoperative throat symptoms. Sore throat following the use of a laryngeal mask appears to be related to the technique of insertion but the contribution of intracuff pressure remains to be clarified.^[1,2]

The results of the analysis conducted reveal that the devices and procedures necessary for securing the airway can cause POST. Physical agents such as tubes irritate the airway during intubation and surgery, causing sore throat. The cuff of the tube, dryness of the mucosa, and abrasion of the airway mucosa during intubation, caused by the rubbing of the intubation tube against the airway mucosa, are thought to be the etiological factors of POST. In addition, the damage to the airway mucosa caused by the strong stimulation by the laryngoscope and the movement of the intubation tube excites the C fibers related to secondary pain, and the subsequent release of neurotransmitters is related to POST.^[3]

Dexamethasone has a wide variety of uses in the medical field. As a treatment, dexamethasone has been useful in treating acute exacerbations of multiple sclerosis, allergies, cerebral edema, inflammation, and shock. Patients with conditions such as asthma, atopic and contact dermatitis, and drug hypersensitivity reactions have benefited from dexamethasone. In endocrinology, dexamethasone has been found useful as a test for Cushing syndrome. Off-label indications are as follows. Dexamethasone is useful in the treatment of chemotherapy-induced nausea and vomiting. It is also used in the prevention and treatment of altitude sickness. It has also been used in the treatment of spinal cord compression due to metastases in oncological cases.^[4,5] Hence; the present study was conducted for comparing the efficacy of equal dose of dexamethasone in preventing POST via three different routes. i.e. intravenous, topical and nebulization before surgery.

MATERIALS AND METHODS

The present study was conducted for comparing the efficacy of equal dose of dexamethasone in preventing POST via three different routes. i.e. intravenous, topical and nebulization before surgery. A total of 150 patients were enrolled in the present study. The patients were assessed a day prior to surgery for pre-anesthetic checkup. All the patients were randomized into three study groups as follows: Group 1: Patients nebulized with dexamethasone (8 mg in 6 ml), Group 2: Patients in which dexamethasone (8 mg in 6 ml) was given intravenously, and

Group 3: Patients which nebulized with normal saline (6 ml) along with topical dexamethasone. The patient was taken to the preoperative area where non-invasive blood pressure and pulse oximeter were attached. Patients were regularly monitored for hemodynamic assessment. All the patients underwent elective surgical procedures as scheduled. Paracetamol infusion and ondansetron 4 mg were given intravenously for postoperative pain relief and postoperative nausea and vomiting. Any cough during extubation was noted. Patients were assessed for POST and hoarseness in postoperative period after 24 h. All the results were recorded in Microsoft excel sheet followed by statistical analysis using SPSS software. Chi-square test and student t test was used for evaluation of level of significance.

RESULTS

Mean age of the patients of group 1, group 2 and group 3 was 41.3 years, 42.5 years and 42.9 years respectively. There were 15 males and 35 females in group 1 while there 12 males and 38 females in group 2. There were 16 males and 34 females in group 3. Mean BMI among patients of group 1, group 2 and group 3 was 23.8 Kg/m², 24.1 Kg/m² and 24.9 Kg/m² respectively. Among group 1, POST was seen in 10 patients while in Group 2 and group 3, POST was seen in 14 patients and 15 patients respectively. Non-significant results were obtained while comparing the incidence of POST among patients of all the three study groups. [Table 1]

Table 1: Comparison of demographic data

| Variable | Group 1 | Group 2 | Group 3 |
|------------------------------------|---------|---------|---------|
| Mean age (years) | 41.3 | 42.5 | 42.9 |
| Males (n) | 15 | 12 | 16 |
| Females (n) | 35 | 38 | 34 |
| Mean BMI (Kg/m ²) | 23.8 | 24.1 | 24.9 |
| Mean duration of surgery (minutes) | 63.8 | 60.9 | 61.5 |

Table 2: Comparison of POST

| POST | Group 1 | Group 2 | Group 3 | p-value |
|---------|---------|---------|---------|---------|
| Present | 10 | 14 | 15 | 0.442 |
| Absent | 40 | 36 | 35 | |
| Total | 50 | 50 | 50 | |

DISCUSSION

Postoperative sore throat has a reported incidence of up to 62% following general anaesthesia. In adults undergoing tracheal intubation, female sex, younger age, pre-existing lung disease, prolonged duration of anaesthesia and the presence of a blood-stained tracheal tube on extubation are associated with the greatest risk. The etiology of POST is complex and multiple mechanisms may contribute including airway trauma and irritation with mucosal injury and inflammation, prolonged ischemia of the mucosa

caused by mechanical pressure, regurgitation of the gastric contents, placement of a gastric tube, etc.^[5-7] Among many factors, mechanical injury of the airway mucosa caused by forceful laryngoscopy and the use of a stylet loaded ETT are considered the main culprits. The available evidence suggests that the mechanical impact on the anterior tracheal wall resulting from the removal of a stylet during endotracheal intubation may be a key factor contributing to POST.^[8-10] Dexamethasone is a corticoid substance used for a variety of indications, including diagnosing Cushing's disease, as therapy for brain oedema, and

as adjunctive treatment in bacterial meningitis for more than 40 years. Corticosteroids represent an additional therapeutic option for symptom relief. Randomised control trials suggest that a short course of low-to-moderate dose corticosteroids probably provides symptomatic benefit to patients with sore throat. Despite this evidence, clinicians do not commonly use steroids. Reasons might include uncertain applicability of the evidence to patients with less severe disease, as the initial studies enrolled only patients with severe sore throat presenting to emergency departments, almost all of whom received antibiotics.^[11-14]

In the present study, mean age of the patients of group 1, group 2 and group 3 was 41.3 years, 42.5 years and 42.9 years respectively. Among group 1, POST was seen in 10 patients while in Group 2 and group 3, POST was seen in 14 patients and 15 patients respectively. Non-significant results were obtained while comparing the incidence of POST among patients of all the three study groups. In a previous study conducted by Shalini Sharma et al, authors compared efficacy of equal dose of dexamethasone in preventing POST via three different routes, i.e., intravenous, topical, and nebulization before surgery. 190 patients were divided into three groups. Patients in group N were nebulized with 8 mg dexamethasone prior to surgery, patients in group I received intravenous dexamethasone (8 mg) before induction of anesthesia, while patients in group C were intubated with endotracheal tube which was pretreated (cuff soaked in dexamethasone 8 mg). The severity of POST and hoarseness of voice was determined by interviewing patients after 24-h of completion of surgery. Incidence of POST decreased in all patients with maximum decrease in group N (18%), while 30.8% in group I and 30.4% in group C. This decrease was not statistically significant when compared to group I (p 0.14) as well as group C (p 0.15). Incidence of hoarseness significantly decreased in group N (15.6%) as compared to group I (40.3%) as well as group C (39.1%). This decrease was statistically significant when compared to group I (p 0.005) as well as group C (p 0.009). Topical dexamethasone (group C) is as effective as intravenous dexamethasone in decreasing incidence of POST, while both the techniques are not effective in decreasing hoarseness of voice.^[11]

Gupta P et al, in another study investigated whether preoperative Dexamethasone can reduce PONV in patients undergoing laparoscopic Surgery. The study included 200 patients undergoing laparoscopic cholecystectomy. They divided the patients into two groups; one group received preoperative Dexamethasone (group 1) and the other group received Ondansetron (group 2). After surgery, patients were observed for any episode of nausea or vomiting, or whether the patient required any anti-emetic drug in the postoperative period. The two groups, (Dexamethasone and Ondansetron) were comparable in outcome, in terms of post-operative

nausea and vomiting, in patients undergoing laparoscopic cholecystectomy. In group I, 24% of patients had nausea, as compared to 30% in group II. Similarly, 12% of patients in group I and 18% of patients in group II had vomiting. They concluded that, preoperative intravenous low dose Dexamethasone reduces the incidence of PONV and is comparable to intravenous Ondansetron.^[12] Subedi A et al, in another study enrolled 180 patients requiring general anesthesia with endotracheal intubation for >90 minutes. They received 1 of the 4 intravenous agents just before induction of anesthesia: lidocaine (1.5 mg/kg) in group L, dexamethasone (8 mg) in group D, lidocaine (1.5 mg/kg) with dexamethasone (8 mg) in group DL, and placebo as normal saline in group NS. Data of 45 patients in D, 44 in L, 44 in DL, and 43 in NS groups were analyzed. The incidence of a sore throat was 36%, 43%, 25%, and 56% in group D, L, DL, and NS, respectively. Dexamethasone with or without lidocaine reduced the incidence of the POST. However, lidocaine was not effective in reducing POST. No difference was observed in the severity of a sore throat, incidence and severity of a cough, and hoarseness among the groups. Dexamethasone, with or without lidocaine, was effective in reducing the incidence of POST in patients requiring prolonged tracheal intubation.^[13]

CONCLUSION

Dexamethasone when given through nebulization route was found to be most efficacious in reducing POST.

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