

Efficacy of Intravenous Dexamethasone and Placebo in Postoperative Sore Throat Prevention after Oral Endotracheal Intubation

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ABSTRACT

Aim: To compare the efficacy of intravenous dexamethasone with placebo in preventing POST after endotracheal intubation in general surgical patients.

Design: Randomized controlled trial.

Place and duration of study: Department of Anesthesiology and Surgical Intensive Care Unit and Pain Management, Civil Hospital, Dow University of Health Sciences Karachi from 12th January 2015 to 11th July 2015.

Methodology: Sixty six patients underwent elective surgical procedures with tracheal intubation were included. Patients were randomly divided in Group A treated with dexamethasone and Group B treated with normal saline. Anesthesia was induced 5 minutes later. Tracheal intubation was performed after ensuring maximum neuromuscular blocking affect. At the end of the 24 hours after surgery POST was evaluated by VAS.

Results: Thirty seven (56.1%) were males and 29(43.9%) were females. Efficacy was significantly high in group A as compare to group B (84.4% vs. 33.3%; p=0.0005).

Conclusion: Prophylactic intravenous administration of dexamethasone was associated with a statistically significant reduction in the incidence of POST after tracheal extubation.

Keywords: Sore throat, Dexamethasone, Endotracheal intubation, General surgical

INTRODUCTION

In majority of the cases undergoing general anesthesia a common side effect of sore throat is observed. This can lead to discomfort for the patient after surgery and prolongs the recovery time¹. Postoperative sore throat (POST) is an undesirable primary outcome with adverse effects reducing patient satisfaction and timely recovery. The incidence-rate is seen as high as 30-100% in patients undergoing endotracheal intubation². Even though it's a minor complication, persists for longer duration than several days and needs to be addressed promptly³.

Within various adverse side effects of a procedure the POST has been reported as 8th major side effect associated with post operative complications⁴. Incidence of POST depends upon various factors including gender, age, endotracheal-tube size, cuff pressure, as well as intubation period, for tube insertion manipulations requirement, number of suctioning attempts. Routine tracheal intubation for various surgical procedure can result in pathological changes, trauma and nerve damage which may account for postoperative symptoms. Various pharmacological trials that have been used for attenuating POST with variable success include use of azulene sulphate, ketamine gargles, steroid gels and steroid injection to reduce POST⁵.

Dexamethasone is widely used as the most potent glucocorticoid with ability of analgesic as well as anti-inflammatory in addition to antiemetic effects. It has been reported to have a prophylactic effect on postoperative sore throat^{2,6}. One study revealed the decrease in the incidence of POST with prophylactic use of dexamethasone during first 24 hrs post operatively to be 22.4% when compared with 55.7% with the use of normal saline⁷. Recent studies have demonstrated that prophylactic-dexamethasone in IV of 0.2mg/kg dosage can result in 30% reduction of the postoperative sore throat incidence within an hour post-extubation having a 60% efficacy⁵.

As the studies shows varying efficacy of dexamethasone ranging from 22.24% to 60%^{5,7}. Therefore whether to use it or not is still controversial. Secondly all of these studies have been done abroad; hence this study is designed to generate local data and post analysis a decision could be taken for its utility of dexamethasone prophylactically in POST prevention.

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MATERIALS AND METHODS

This randomized controlled trial was conducted at the Department of Anesthesiology and Surgical Intensive Care Unit and Pain Management, Civil Hospital, Dow University of Health Sciences Karachi from 12th January 2015 to 11th July 2015 and 66 patients were enrolled. All patients between 20 to 60 years of age, either gender, ASA physical status I and II, elective surgical procedures with tracheal intubation and Mallampati grade 1 and 2 were included. Pre existing Upper respiratory tract infection, ASA physical status III and above, known allergy to study drug, recent usage of any type of NSAID or, and multiple attempts of intubation were excluded. Patients were randomly divided into two groups by lottery method. Group A received intravenous dexamethasone 0.2mg/kg and Group B received 4ml of normal saline IV by the operation theatre nurse after their arrival in the operating room. Anesthesia was induced 5 minutes later. After application of standard monitoring of non-invasive blood pressure, ECG, pulse oximetry and maintaining intravenous line, patient prepared for general anesthesia was preoxygenate with 100% oxygen followed by induction with Inj. Propofol 2mg/kg, Inj. Nalbuphine 0.1mg/kg and Inj. Atracurium 0.5mg/kg and the trachea was intubated with the soft, high volume, low pressure cuff, sterile poly vinyl chloride (PVC) endotracheal tube with internal diameter of 7 to 7.5 for females and 7.5 to 8.0 for males was filled with the air, up to the volume of no audible leak. Tracheal-intubation was conducted by a highly professional anesthesiologist post confirmation of the neuromuscular-blocking affect at max. After intubation a balanced general anesthesia technique with measured ventilation was maintained through 33% oxygen, 67% nitrous oxide, 0.8-2% Isoflurane and incremental dose of Inj. Atracurium to maintain a constant neuromuscular block. Residual Atracurium relaxation was reversed with Injection of Neostigmine 0.04mg/kg and Inj. Glycopyrolate 0.01mg/kg on the surgery completion. Oropharyngeal-suction was conducted through direct visionary state for avoiding tissue trauma prior to extubation and also for the confirmation of complete secretions clearance. At the end of 24 hours after surgery POST was evaluated by the researcher himself and graded on VAS of 0-1 and POST was labelled as no (if patient's VAS score was 0 to 3) or yes (if patient's VAS score was >3). This information along with demographics and related variables like age, gender, duration of surgery, duration of anaesthesia, ASA status, Mallampatti grade, height, weight of the patient and grading of POST was noted. The data was entered and

analyzed through SPSS-17. Independent sample t test was applied for mean comparison and chi-square test was applied to compare efficacy between groups at 24 hours postoperatively. P value ≤ 0.05 was considered as significant.

RESULTS

The frequency and percentage of age, gender, ASA status, Mallampatti grade and grading of postoperative sore throat were shown in Table 1. When the age, weight and height of the patients were compared, it was found no significant ($P > 0.05$) difference between groups (Table 2). The efficacy was significantly higher ($p = 0.0005$) in group A (dexamethasone) was 84.4% as compare to group B (normal saline) was 33.3% (Table 3).

Table 1: Demographic information of the patients in both groups (n=66)

Variable	Dexamethasone		Normal Saline	
	No.	%	No.	%
Age (years)				
≤ 30	8	24.24	9	27.27
31 – 40	17	51.52	10	30.30
41 – 50	8	24.24	14	42.42
Gender				
Male	20	60.61	17	51.62
Female	13	39.39	16	48.48
ASA Status				
ASA I	18	54.55	21	63.63
ASAI	15	45.45	12	36.37
Mallampati Status				
Class I	23	69.70	19	57.58
Class II	10	30.30	14	42.42
Grading of Postoperative Sore Throat				
No sore throat	19	57.58	6	18.18
Mild	9	27.27	5	15.15
Moderate	4	12.12	19	57.58
Severe	1	3.03	3	9.09

Table 2: Comparison demographics in both groups

Variables	Dexamethasone (N=33)	Normal Saline (n=33)	P-Value
Age (Years)	34.36 \pm 7.25	37.27 \pm 9.41	0.16
Weight (kg)	62.52 \pm 7.86	62.76 \pm 5.43	0.88
Height (cm)	151.85 \pm 7.32	152.92 \pm 3.95	0.44

Table 3: Comparison of efficacy between the groups

Efficacy	Dexamethasone (N=33)	Normal Saline (n=33)	P-Value
Yes	28 (84.8%)	11 (33.3%)	0.0005
No	5 (15.2%)	22 (66.7%)	

DISCUSSION

Endotracheal-intubation resulted in commonly reported side effects of sore throat and larynx hoarseness. Its incidence limits around 6.6% to 90%.^{8,9} This can augment patients stress and unpleasant operative memory.^{8,10} Various researches have reported steroids to assist in decreasing the sore throat side effect through anti-inflammatory modification of the injured tissue. The leukocytes transfer to the injured site is inhibited as well as fibroblast-proliferations during the mechanism of anti-inflammation and cellular integrity is maintained through cytokinin release¹⁰⁻¹².

The arachidonic acid metabolism is inhibited by the dexamethasone and leukotriene-B4 formation which leads in interleukin 2 factor inhibition¹³.

Dexamethasone one of potential corticosteroid having analgesic, antiemetic as well as anti-inflammatory properties^{14,15}. POST is prevented through application of dexamethasone yet various literature debated on its efficacy. Bagchi et al¹⁵ presented results wherein dexamethasone prophylaxis treatment decreased POST within an hour post-extubation by a value of 30%, whereas in another study by Ruangsins et al¹⁶ dexamethasone IV did not had any significant effect in reducing POST.

In the current research the Dexamethasone efficacy was measured as 84.4% in POST prevention against 33.3% in group of normal saline. Similar results have been reported by Park et al¹⁰ where decrease in sore throat within an hour of post-extubation was found to be 22% with 0.1 mg/kg dosage while 42% through 0.2 mg/kg dexamethasone prophylactic dosage in IV respectively. Thomas et al¹⁷ presented data where 36.3% reduction in sore throat was observed through 8mg/kg IV dexamethasone usage in IV for 24 hours post-extubation. A 56.7% reduction for two hours has also been reported in other studies by application of 0.1mg/kg dexamethasone pre-operatively¹⁸.

The usage of IV 10mg dexamethasone pre-operatively, has resulted in 6 hours reduction of sore throat.⁶ The results are similar to the current study findings where a reduction was observed for 24 hours.

There is still a need of further detailed investigation for assessing the dose range and dexamethasone IV effect, especially in cases of POST high risk.

CONCLUSION

The prophylactic-intravenous usage of dexamethasone is linked with statistically significant decrease in POST incidence in cases of post-tracheal extubation.

Conflict of interest: Nothing to declare

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