

A Prospective Study of IV Dexamethasone in Reducing Post-Op Cough Hoarseness and Sore Throat in Patients undergoing Microvascular Reconstruction Surgery

Geetha Singam¹, Akhya Kumar Kar², Kaniti Geeta³, R. Gopinath⁴, Srikant⁵

^{1,2}Assistant Professor ³Professor ⁴Professor and Head, Department of Anaesthesia ⁵Professor and Head, Department of Plastic Surgery, Nizam's Institute of Medical Sciences, Hyderabad, Telangana 500082, India.

Abstract

Microvascular reconstruction surgery operated for more than 5 hours duration under general anaesthesia with endotracheal intubation is challenging to the anaesthesiologist. Post op cough, hoarseness and sorethroat are side effects, causing dissatisfaction to the patient and can prolong recovery time. *Materials and Methods:* Our prospective study of sixty patients was randomized into two groups of thirty each. Group D patients received iv dexamethasone 8 mg and group N patients received normal saline 2 ml after intubation. Postop cough, sore throat and hoarseness will be noted immediate after extubation, 30 minutes, one hour and twenty fours post extubation. *Results:* The incidence of postop cough was lower in dexamethasone group patients than normal saline group patients at extubation (but not statistically significant with $p=0.166$). Dexamethasone group patients also had lower postop hoarseness score at 60 minutes post extubation ($p= 0.181$). *Conclusion:* Administration of intravenous dexamethasone can reduce the incidence of postop cough in patients undergoing microvascular reconstruction surgery.

Keywords: Microvascular Reconstruction; Dexamethasone; Endotracheal Intubation; Cough; Hoarseness; Sorethroat.

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Introduction

Microvascular reconstruction surgery under general anaesthesia with endotracheal intubation for more than (five) 5 hours duration is challenging to the anaesthesiologist. Post op cough, hoarseness and sorethroat are side effects causing dissatisfaction to the patient and can prolong recovery time [1].

Postop Sore Throat

Is due to patient related factors like age, sex and smoking. Regarding Airway related factors, incidence of sore throat is maximum with endotracheal tube,

moderate with laryngeal mask airway and minimum with face mask. Intubation factors include technique, duration [2], tube size, intracuff pressure, cuff design, intraoperative tube movement, and suctioning. It is mediated by aseptic inflammatory process due to irritation of the pharyngeal mucosa during laryngoscopy, damage of tracheal mucosa by the endotracheal tube cuff and trauma to the tissues during intubation and extubation.

Postop Hoarseness

It depends on the type of surgery, sex of the patient, intubating factors such as endotracheal tube size, endotracheal cuff design and cuff pressure, physical

Corresponding Author: Akhya Kumar Kar, Assistant Professor, Department of Anaesthesia, Nizam's Institute of Medical Sciences, Hyderabad, Telangana 500082, India.
E-mail: karakshay@gmail.com

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trauma during intubation, movement of the tube and duration of intubation [3]. It is due to laryngeal injury and oedema of the vocal cords following endotracheal intubation, mechanical contact and abrasion by the tube in the glottic area.

Postop cough

During intraoperative lighter planes of anaesthesia or emergence, endotracheal tube movement may cause irritation of the trachea and laryngeal mucosa leading to cough. Advantage of cough is it removes respiratory secretions and decreases the risk of aspiration. Disadvantage is it activates the sympathetic nervous system causing tachycardia, hypertension, bleeding at the surgical site, intraocular hypertension and intracranial hypertension.

Dexamethasone

It is a powerful corticosteroid with anti-inflammatory, analgesic and antiemetic effects [4]. Prophylactic dexamethasone administration before surgery reduces pain and edema in the oral area after surgery. Use of steroids prophylactically decrease the incidence of cough and sore throat during recovery by modifying the inflammatory process due to tissue injury. This antiinflammatory effect is by inhibition of leukocyte migration to the site of inflammation and inhibition of cytokines release by maintaining cellular integrity. Steroids also inhibit fibroblast proliferation.

As microvasclular reconstruction surgery is a major surgery done for prolonged duration under general anaesthesia, endotracheal tube can cause mechanical compression of trachea leading to oedema of the airway causing postop sore throat, cough and hoarseness. Various studies are available in literature on steroid gels and steroid injections, azulene sulphate and ketamine gargle to reduce the incidence of postop sorethroat. As there is no study done in microvascular reconstruction surgery on postop sorethroat, we designed to see the effectiveness of intravenous administration of dexamethasone in reducing the incidence of postop cough, hoarseness and sore throat.

Methods

Our prospective study of sixty patients aged 18 to 65 years of both genders were divided into two groups of thirty each.

Group D: The patients received intravenous (iv) dexamethasone eight (8) mg in 2 ml.

Group N: the patients received intravenous normal saline (2 ml).

Inclusion Criteria

(American Society of Anaesthesia) ASA grade I-II patients of both genders aged 18 to 65 years posted for microvascular reconstruction surgery under general anaesthesia with endotracheal intubation for more than 5 hours duration.

Exclusion Criteria

Patients with ASA grade III-IV with surgery duration less than 5 hours. Other exclusion criteria are Patients on corticosteroids or coming with nasogastric tube, Patients with respiratory disease, sore throat, hoarseness and cough, neuromuscular disease and Patients with anticipated difficult airways, requiring more than three attempts for intubation.

Anaesthetic Management

Our prospective study of sixty patients was randomized into two groups of thirty each (by sealed envelope method) after obtaining approval from the institute ethics committee and written informed consent from the patients. Group D patients received iv dexamethasone 8 mg and group N patients received normal saline. Our patients were premedicated with tablet Alprazolam 0.5 mg and rantidine 150 mg evening before and on the morning of day of surgery.

After arrival in the operating room, the patients were connected to the monitors: electrocardiogram (ECG), noninvasive blood pressure (NIBP), pulse oximetry (SpO₂) and endtidal carbon dioxide (ETCO₂). After securing good intravenous line, the patients were premedicated with inj glycopyrrolate 0.1 mg and inj fentanyl 2µg/kg. The patients were preoxygenated for 3 minutes and induced with injection thiopentone 4-6 mg/kg. After administering intermediate acting muscle relaxant Injection Atracurium chloride 0.5 mg/kg, the patients were intubated with appropriate size endotracheal tube. Later, the patients received either iv dexamethasone 8 mg or normal saline 2 ml. Maintanance of anaesthesia was with volume controlled mode of ventilation with O₂; Air, sevoflurane inhalational agent and iv infusion of atracurium with fentanyl. At the end of surgery, the patients were reversed with Inj Neostigmine

0.05 mg/kg and glycopyroloate 0.01 mg/kg. Postop cough, sore throat and hoarseness were noted immediate after extubation, 30 minutes, one hour and twenty fours post extubation.

Postop Sore Throat:

Score:

- 0: No sore throat since the time of operation.
- 1: Minimum sore throat. (patient answered in the affirmative on enquiry)
- 2: Moderate sore throat. (Patient complained on his own)
- 3: Severe sore throat. (patient is in obvious distress and noticed by the observer)

Postop Cough

- 0: No cough since the time of operation
- 1: Minimum cough
- 2: Moderate cough
- 3: Severe cough

Postop Hoarseness

- 0: No hoarseness since the time of operation
- 1: Minimum hoarseness (patient answered in the affirmative on enquiry)
- 2: Moderate hoarseness (Patient complained on his own)
- 3: Severe hoarseness (gross change in voice noticed by observer)

Statistical Analysis

Results on continuous measurements are presented on Mean SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5% level of significance. Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups (Inter group analysis) on metric parameters. Leven’s test for homogeneity of variance has been performed to assess the homogeneity of variance.

Chi-square/Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups, Non-parametric setting for Qualitative data analysis. Fisher Exact test used when cell samples are very small.

Results

Regarding demoprahic profile, both groups were similar in terms of gender and weight (Table 1 and 2).

Table 1: Gender distribution of patients studied

Gender	Dexamethasone group	Normal saline group	Total
Female	6(20%)	5(16.7%)	11(18.3%)
Male	24(80%)	25(83.3%)	49(81.7%)
Total	30(100%)	30(100%)	60(100%)

p=0.739, Not Significant, Chi-Square Test

Table 2: Weight (kg) distribution in two groups of patients studied

Weight (kg)	Dexamethasone group	Normal saline group	Total
41-50	3(10%)	2(6.7%)	5(8.3%)
51-60	9(30%)	10(33.3%)	19(31.7%)
61-70	15(50%)	15(50%)	30(50%)
71-80	3(10%)	3(10%)	6(10%)
Total	30(100%)	30(100%)	60(100%)
Mean ± SD	61.53±7.61	61.43±7.30	61.48±7.39

p=0.959, Not Significant, Student t test

Compared to the normal saline group patients, the patients receiving dexamethasone had lower incidence of cough at extubation, (p= 0.166) (but not statistically significant) than at 30 minutes postextubation (p=0.706), 1 hour postextubation (p=0.706) and twenty four hours postextubation (p= 1.000) (Table 3).

The dexamethasone group patients had lower incidence of postop hoarseness at 60 minutes after extubation than normal saline group patients but not statistically significant (p=0.181).

The incidence of hoarseness was similar in both the groups at extubation, (p=0.671), 1 hour after extubation (p=0.706) and 24 hours after extubation. (p=0.671) (Table 4).

The incidence of postop sore throat was similar in both dexamethasone group and normal saline group patients at extubation (p=0.612), 30 minutes after extubation (p=0.671), 1hour post extubation (p=0.424) and 24 hours after extubation (p=.0.612) (Table 5).

Table 3: Post op cough distribution in two groups of patients studied

Post op cough score	Dexamethasone group (n=30)	Normal saline group (n=30)	Total (n=60)	P value
Extubation				
No	27(90%)	23(76.7%)	50(83.3%)	0.166
Yes	3(10%)	7(23.3%)	10(16.7%)	
30 min post extubation				
No	27(90%)	25(83.3%)	52(86.7%)	0.706
Yes	3(10%)	5(16.7%)	8(13.3%)	
60 min post extubation				
No	27(90%)	25(83.3%)	52(86.7%)	0.706
Yes	3(10%)	5(16.7%)	8(13.3%)	
24 hrs post extubation				
No	30(100%)	30(100%)	60(100%)	1.000
Yes	0(0%)	0(0%)	0(0%)	

Chi-Square/Fisher Exact Test

Table 4: Postop hoarseness distribution in two groups of patients studied

Postop hoarseness score	Dexamethasone group (n=30)	Normal saline group (n=30)	Total (n=60)	P value
Extubation				
0	28(93.3%)	26(86.7%)	54(90%)	0.671
1	2(6.7%)	4(13.3%)	6(10%)	
30 min post extubation				
0	27(90%)	25(83.3%)	52(86.7%)	0.706
1	3(10%)	4(13.3%)	7(11.7%)	
2	0(0%)	1(3.3%)	1(1.7%)	
60 min post extubation				
0	27(90%)	22(73.3%)	49(81.7%)	0.181
1	3(10%)	7(23.3%)	10(16.7%)	
2	0(0%)	1(3.3%)	1(1.7%)	
24 hrs post extubation				
0	28(93.3%)	26(86.7%)	54(90%)	0.671
1	2(6.7%)	4(13.3%)	6(10%)	

Chi-Square/Fisher Exact Test

Table 5: Postop sore throat distribution in two groups of patients studied

Postop sore throat score	Dexamethasone group (n=30)	Normal saline group (n=30)	Total (n=60)	P value
Extubation				
No	29(96.7%)	27(90%)	56(93.3%)	0.612
Yes	1(3.3%)	3(10%)	4(6.7%)	
30 min post extubation				
No	28(93.3%)	26(86.7%)	54(90%)	0.671
Yes	2(6.7%)	4(13.3%)	6(10%)	
60 min post extubation				
No	28(93.3%)	25(83.3%)	53(88.3%)	0.424
Yes	2(6.7%)	5(16.7%)	7(11.7%)	
24 hrs post extubation				
No	29(96.7%)	27(90%)	56(93.3%)	0.612
Yes	1(3.3%)	3(10%)	4(6.7%)	

Chi-Square/Fisher Exact Test

Discussion

Microvascular reconstruction is a major surgery done under general anaesthesia done for prolonged duration. Endotracheal tube can cause mechanical compression of trachea leading to oedema of the airway causing postop sore throat, cough and hoarseness. Factors influencing are larger diameter of the tracheal tube, low volume-high pressure cuff, bucking on the tube, movement of the tracheal tube during the surgery, and excessive pharyngeal suctioning during extubation [5]

In our study the incidence of postop cough was less in dexamethasone group than normal saline group at 1 hour post extubation. Dexamethasone group patients also had lower postop hoarseness score at 60 minutes after extubation than normal saline group patients.

In a study done by Park et al found that prophylactic administration of iv dexamethasone 0.1 mg/kg and 0.2 mg/kg reduced postop sore throat after general anesthesia with endotracheal intubation. Thomas et al. also concluded that IV dexamethasone (8 mg) prophylactically reduces the incidence and severity of sore throat induced by tracheal intubation.

Bagchi et al. showed that prophylactic dexamethasone decreases the incidence of postop sore throat at 1 hour after extubation. But in our study the incidence of postop sore throat was similar in both the groups.

Conclusion

The incidence of postop cough can be reduced with administration of intravenous dexamethasone in patients undergoing microvascular reconstruction surgery.

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