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Original Research Article

Comparison of Effectiveness of Nebulized Dexamethasone V/S Nebulized Dexmedetomidine in Prevention of Post-Operative Sore Throat after General Endotracheal Anaesthesia

Ashwini S.[1], Namratha L.[2], Nadashree A. S.[3]

[1]Associate Professor, Dept of Anaesthesiology, SIMS, Shivamogga
[2]Assistant Professor, Dept of Anaesthesiology, SIMS, Shivamogga
[3]Post Graduate Resident, Dept of Anaesthesiology, SIMS, Shivamogga

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Corresponding author: Dr. Nadashree A. S.
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Abstract

Background: Endotracheal intubation causes airway mucosal injury which results in Post-operative sore throat (POST) with incidence of 21-65%.If unresolved it produces significant pain and discomfort to the patient and increases the incidence of postoperative morbidity and length of stay in PACU. Dexamethasone is commonly used in the treatment of sore throat. Dexmedetomidine, selective alpha-2 adrenergic agonist used for attenuation of intubation response. We conducted this study to compare the effectiveness of nebulized dexamethasone and dexmedetomidine in preventing POST in patients undergoing general endotracheal anaesthesia.

Methodology: Patients aged 18-60years, ASA I and II, either sex posted for elective surgery requiring general endotracheal anaesthesia were randomly allocated into 2 groups of 50 each. Group 1(Dexamethasone)-8mg(2ml) diluted to 5ml using Normal saline Group 2(Dexmedetomidine)-50microgram(0.5ml) diluted to 5ml using Normal saline. Both the groups received nebulization for 15minutes.15minutes after the completion of nebulization, general endotracheal anaesthesia was provided. After extubation, patients assessed for sore throat at 0^{th} hour, then 2^{nd}, 6^{th}, 12^{th}, 24^{th} hr in postoperative ward and graded on 4 point scale (0-3). Hemodynamic parameters HR, SBP, DBP and MAP were recorded at time intervals: Before nebulization, after nebulisation, before intubation, immediately after intubation-0thminute, 2ndminute and 5thminute.

Results: The incidence of POST was comparable in both groups at 0^{th}, 2^{nd}, 12^{th} and 24^{th}hour postoperatively. At 6^{th} hour, the incidence of sore throat was significantly greater in Group2.HR was significantly lower in Group2 at all time intervals post nebulization except at 0thminute. There was statistically significant fall in SBP and MAP at 2^{nd}minute post intubation in Group2.

Conclusion: Nebulized dexmedetomidine (50mcg in 5mlNS) is as effective as nebulized Dexamethasone (8mg in 5mlNS) given preoperatively in reducing the incidence and severity of POST after general endotracheal anaesthesia. Nebulized dexmedetomidine has an added advantage of attenuating the hemodynamic stress response to laryngoscopy and endotracheal intubation.

Keywords: Dexamethasone; Dexmedetomidine; Endotracheal intubation; Hemodynamic Stress Response; Nebulization; Postoperative sore throat.

Introduction

Post operative sore throat is the most common postoperative complication following endotracheal intubation. Although clinicians often consider it as a relatively minor complication, patients perceive avoidance as being of great importance. [1]

Endotracheal intubation causes airway mucosal injury which results in post-operative sore throat with an incidence of 21-65%. If unresolved it produces significant pain and discomfort to the patient and increases the incidence of post-operative morbidity and length of stay in PACU. [2] Various non pharmacological and pharmacological methods have been used to decrease the incidence of post-operative sore throat with no proven single modality.

The non-pharmacological methods include use of smaller size tracheal tube, careful airway manipulation, intubation after complete muscle relaxation, minimizing the number of laryngoscopy attempts, maintaining endotracheal tube cuff pressure at or below 20cm H2O, gentle pharyngeal suctioning under vision and extubation when the tracheal tube cuff is fully deflated, avoidance of coughing on tube during

extubation.[2] Pharmacological methods include the following drugs in various routes dexamethasone, beclomethasone, lidocaine, azulenesulphonate, ketamine, magnesium sulphate, liquorice, benzydamine hydrochloride. [2,3]

Steroids have anti-inflammatory effect and extensively used in common practice. Inhaled steroids deliver the drug to the site of action without systemic effects.

Dexamethasone is a potent synthetic glucocorticoid used in treatment of sore throat.[2] Dexmedetomidine is a selective alpha -2 adrenergic agonist. It causes sedation and analgesia. It produces significant reduction in the levels of serum IL-6,IL-8 and TNF alpha post operatively. It is commonly used for attenuation of intubation response.[4]

Dexmedetomidine is a highly lipid soluble agent with good systemic absorption on transmucosal administration. When given as nebulization preoperatively it reduces the incidence of postoperative sore throat.[5] But the number of studies reporting its use in preventing postoperative sore throat are limited .Hence we planned this study to compare the effectiveness of nebulized dexamethasone with nebulized Dexmedetomidine in preventing post-operative sore throat in patients undergoing general endotracheal anaesthesia and to assess the possible positive effect of nebulized Dexmedetomidine in attenuating the hemodynamic stress response to laryngoscopy and intubation.

Methodology

After obtaining clearance from Institutional Ethics Committee, the study was conducted on 100 subjects undergoing elective surgeries requiring general anaesthesia with endotracheal intubation, with Informed Consent taken from all the subjects involved in the study.

Patients in the age between 18-65 years of either sex belonging to ASA-I-II, undergoing elective surgery in supine position requiring general anaesthesia with endotracheal intubation were included in the study.

Patients having pre-operative sore throat or cold, Asthma, COPD, having known allergies to the drug, pregnant patients, undergoing intraoral surgeries and patients with anticipated difficult airway were excluded from the study.

Patients were randomized using computer generated random number, study population was divided into 2 groups of 50 each.

Group 1-received nebulization of 8mg (2ml) of Dexamethasone diluted to 5ml using Normal saline.

Group 2- received nebulization of 50 microgram (0.5ml) of Dexmedetomidine diluted to 5ml using Normal saline.

Pre-anaesthetic evaluation was done on the previous day and informed consent was obtained. IV line was secured. The study drug was given by nebulization for 15 minutes in the preoperative room. Pre nebulization and post nebulization hemodynamic parameters were noted. Patients were shifted to operating room. ASA standard monitors (ECG, Pulse oximeter, NIBP, Temperature and end tidal CO2) were attached. 15 minutes after the completion of nebulization, General anaesthesia was provided premedication with injection midazolam 0.02mg/kg, injection fentanyl 2 microgram/kg and induction with injection propofol 2mg/kg after preoxygenation with 100 % O2 for 3 minutes through face mask done. Tracheal intubation was facilitated with injection Vecuronium 0.1mg/kg IV. All patients were orally intubated with sterile cuffed polyvinyl chloride tubes of appropriate size. The tracheal cuff was then inflated with air to cuff pressure of 20cm H2O and thereafter cuff pressure was checked every 15 minutes to maintain the same pressure till the end of surgery.

After confirmation of tracheal tube position anaesthesia was maintained with O2, N2O, isoflurane and intermittent doses of vecuronium and ventilated using intermittent positive pressure ventilation. Injection ondansetron 4mg IV was given 30 minutes before the end of the procedure. At the end of the surgery gentle suctioning of oropharynx was done. Then inspiratory O2 concentration was kept at 100%. The residual neuromuscular block was reversed with 50microgram /kg of neostigmine and 10microgram/kg glycopyrrolate and patient was extubated.

After extubation, patient was shifted to recovery room where patients were assessed for sore throat at 0^{th} hour, then at 2^{nd}, 6^{th}, 12^{th}, 24^{th} hr in post-operative ward and graded on 4 point scale (0-3) (72).

0-No sore throat

1-Mild sore throat (upon asking only patient complaints of sore throat)

2-Moderate sore throat (patient himself complains of sore throat)

3-Severe sore throat (change of voice or hoarseness associated with throat pain)

The hemodynamic parameters such as HR, SBP, DBP and MAP were recorded

Before nebulisation, after nebulisation, just before intubation, immediately after

Intubation-0th minute, 2nd minute and 5th minute post-intubation.

Statistical Analysis

Data was entered in Microsoft excel data sheet.

- Data analysis was done with the help of statistical software Epi Info 7.2.5
- Quantitative data was presented using Mean and Standard Deviation.
- Qualitative data was presented as numbers and frequencies.
- Chi-square test or Fisher's Exact test was used to find an association between various categorical parameters.
- Student's t-test was used to find the difference between the means of the two groups.
- Repeated Measure ANOVA and Mixed Model ANOVA tests were used to assess

The variables variations over time (HR, SBP, DBP, MAP) and to compare the same between the groups respectively.

- P -value of less than 0.05 was considered statistically significant.
- Bar graphs and line diagrams were used when deemed necessary for data visualization.

Results

The mean age of subjects in the Dexamethasone group was 42.9 years (SD = 10.8), while in the Dexmedetomidine group, it was 41 years (SD = 11.7). The independent samples t-test yielded a p-value of 0.404, indicating the groups were comparable with respect to age.

Among the two groups (Dexamethasone and Dexmedetomidine), 90% of the females received Dexamethasone, while 82% received Dexmedetomidine. For males, 10% were treated with Dexamethasone and 18% with Dexmedetomidine.

The chi-square test revealed a non-significant p-value of 0.7, indicating genders are equally distributed among two groups.

Both groups were comparable with respect to duration of surgery and anaesthesia with Median duration of anaesthesia being 96 minutes in group 1 and 92 minutes in group2.(p value=0.065)

Table 1: Incidence of Sore Throat at different time points among the two groups

	Dexamethasone		Dexmedetomidine		Total		P value
Sore throat	**N**	**%**	**N**	**%**	**N**	**%**	
0th Hour	25	50.0 %	19	38%	56	44%	0.31 NS
2nd Hour	26	52%	29	58%	45	55%	0.54NS
6th Hour	14	28%	24	48%	62	38%	0.038 S
12th Hour	10	20%	13	26%	77	23%	0.47NS
24the Hour	8	16%	8	16%	16	16%	1 NS
Total	50	100.0 %	50	100.0 %	100	100.0 %	
Chi-square test is applied, S= Significant, NS= Not significant							

Table 2: Severity of Sore Throat (0th hour) between the two groups

	Dexamethasone		Dexmedetomidine		Total		P value
Sore throat (0th Hour)	**N**	**%**	**N**	**%**	**N**	**%**	
No Sore Throat	25	50.0 %	31	62.0 %	56	56.0 %	**0.229NS**
Mild Sore Throat	17	34.0 %	16	32.0 %	33	33.0 %	
Moderate Sore Throat	8	16.0 %	3	6.0 %	11	11.0 %	
Total	50	100.0 %	50	100.0 %	100	100.0 %	
Chi-square test/ Fisher exact test is applied, S= Significant, NS= Not significant							

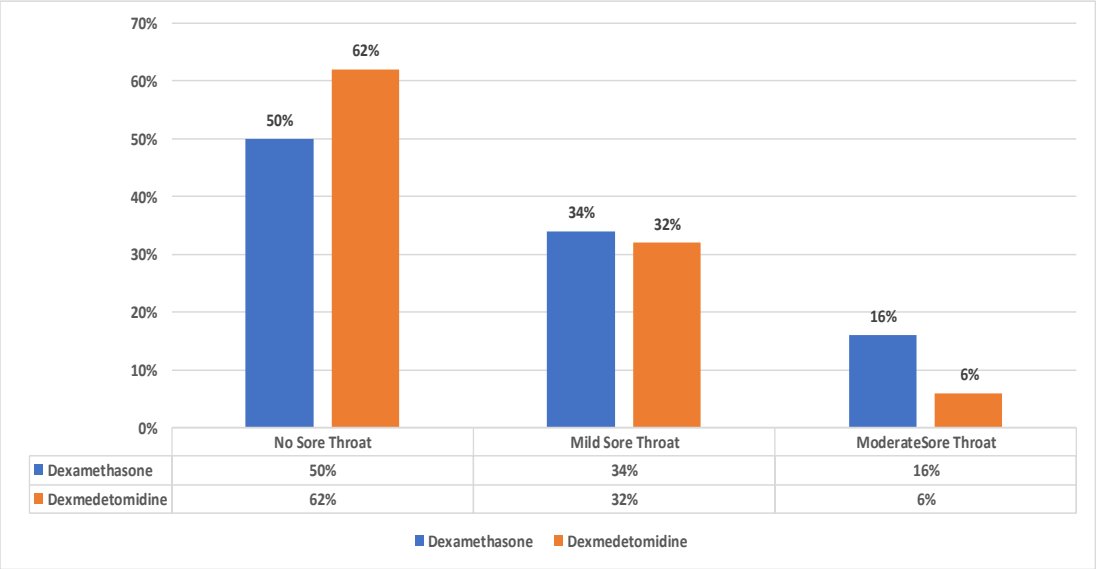

Figure 1: Severity of Sore Throat (0 hour) between the two groups

Table 3: Severity of Sore Throat (2nd hour) among groups

	Dexamethasone		Dexmedetomidine		Total	P value
Sore throat (2nd Hour)	**N**	**%**	**N**	**%**	**N**	
No Sore Throat	24	48%	21	42%	45	**0.811NS**
Mild Sore Throat	19	38%	22	44%	41	
Moderate Sore Throat	7	14%	7	14%	14	
Total	50	100.0 %	50	100.0 %	100	
Chi-square test is applied, S= Significant, NS= Not significant						

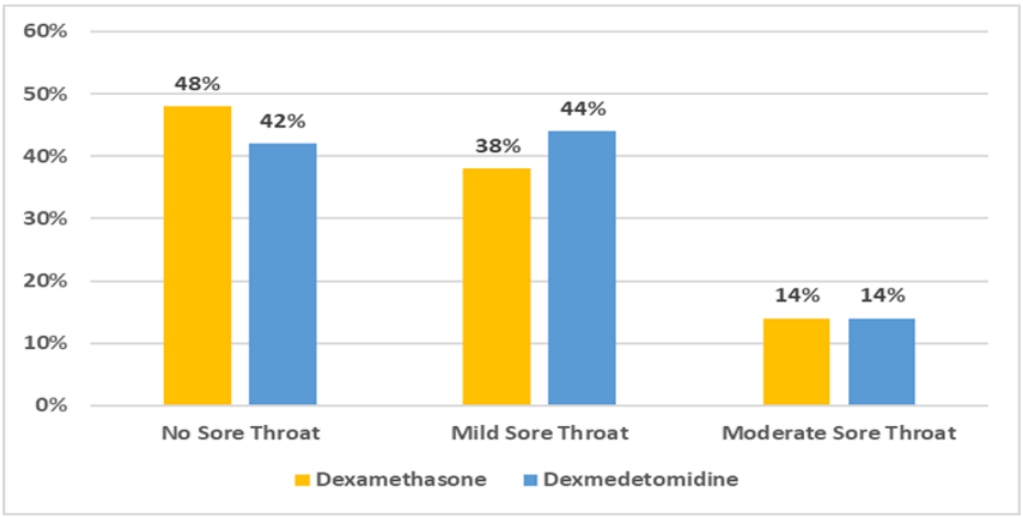

Figure 2: Severity of Sore Throat at 2nd hour between the groups

Table 4: Severity of Sore Throat (6th hour) between the two groups

Dexamethasone			Dexmedetomidine		Total		P value
Sore throat (6th Hour)	**N**	**%**	**N**	**%**	**N**	**%**	
No Sore Throat	36	72.0 %	26	52.0 %	62	62.0 %	**0.075NS**
Mild Sore Throat	9	18.0 %	19	38.0 %	28	28.0 %	
Moderate Sore Throat	5	10.0 %	5	10.0 %	10	10.0 %	
Total	50	100.0 %	50	100.0 %	100	100.0 %	
Chi-square test/ Fisher exact test is applied, S= Significant, NS= Not significant							

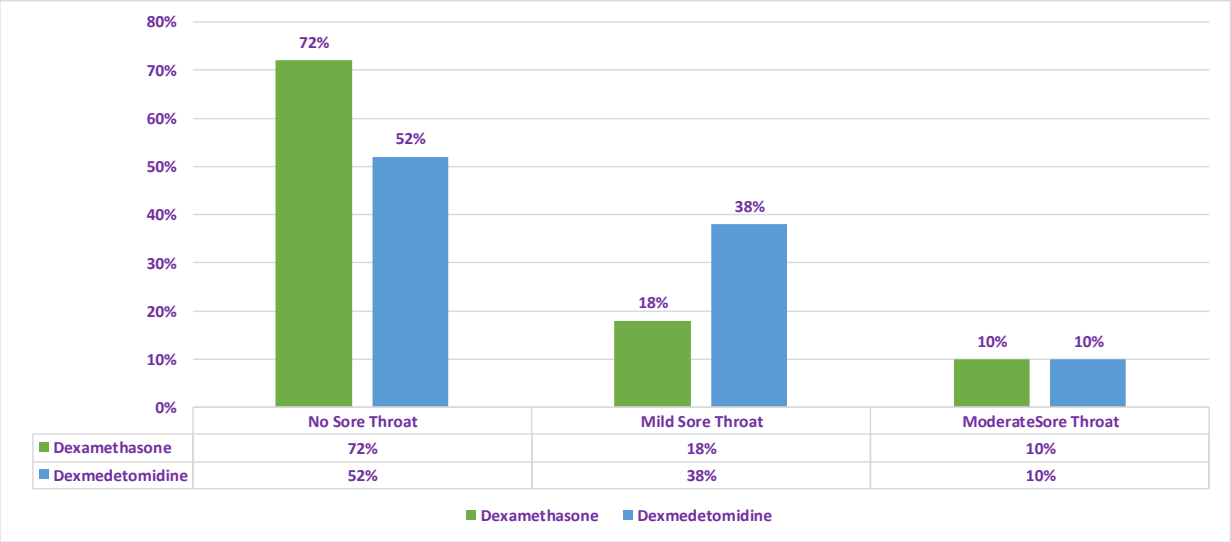

Figure 3: Severity of Sore Throat (6th hour) between the two groups

Table 5: Severity of Sore Throat (12th hour) between the two groups

Dexamethasone			Dexmedetomidine		Total		P value
Sore throat (12th Hour)	**N**	**%**	**N**	**%**	**N**	**%**	
No Sore Throat	40	80.0 %	37	74.0 %	77	77.0 %	**0.722NS**
Mild Sore Throat	9	18.0 %	11	22.0 %	20	20.0 %	
Moderate Sore Throat	1	2.0 %	2	4.0 %	3	3.0 %	
Total	50	100.0 %	50	100.0 %	100	100.0 %	
Chi-square test/ Fisher exact test is applied, S= Significant, NS= Not significant							

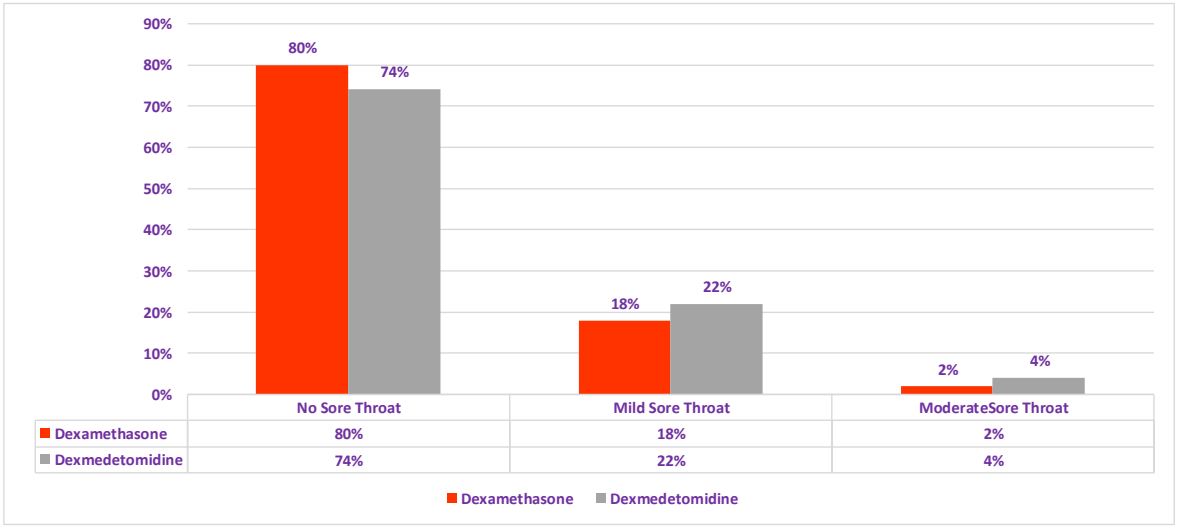

Figure 4: Severity of sore throat (12 th hour) between the two groups

Table 6: Severity of Sore Throat (24th hour) between the two groups

Dexamethasone			Dexmedetomidine		Total		P value
Sore throat (24th Hour)	**N**	**%**	**N**	**%**	**N**	**%**	
No Sore Throat	42	84.0 %	42	84.0 %	84	84.0 %	**0.587NS**
Mild Sore Throat	7	14.0 %	8	16.0 %	15	15.0 %	
Moderate Sore Throat	1	2.0 %	0	0.0 %	1	1.0 %	
Total	50	100.0 %	50	100.0 %	100	100.0 %	
Chi-square test/ Fisher exact test is applied, S= Significant, NS= Not significant							

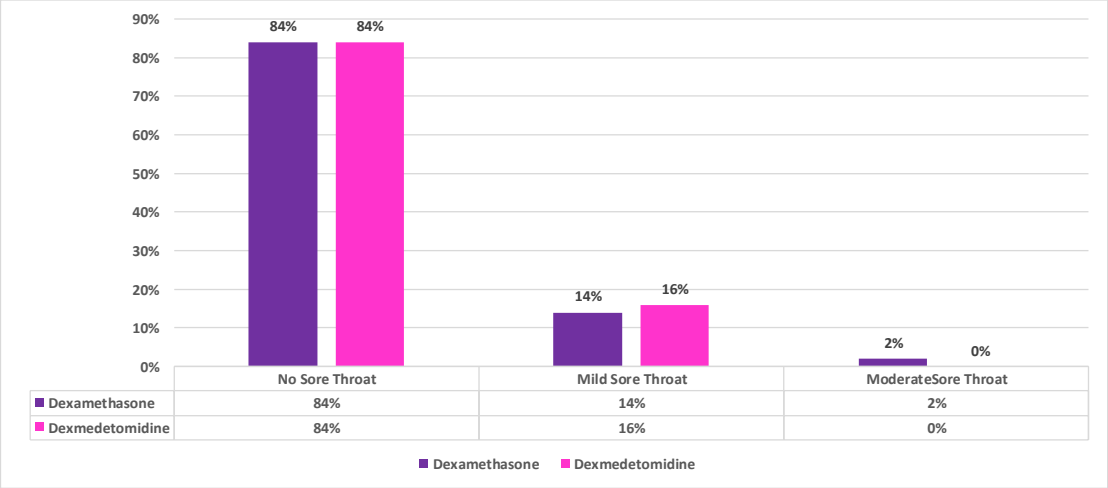

Figure 5: Severity of Sore Throat (24th hour) between the two groups

Table 7: Haemodynamic parameters at different time intervals between the groups

	Vitals	Group	N	Mean	SD	p	P -Value (Repeated Measure ANOVA-between 2 groups)
Heart rate	HR Pre nebulization	Dexamethasone	50	88.8	17.2	**0.463NS**	**0.133 NS**
		Dexmedetomidine	50	86.4	15		
	HR Post nebulization	Dexamethasone	50	89.6	15	**0.004HS**	
		Dexmedetomidine	50	80.9	14.6		
	HR Before intubation	Dexamethasone	50	86.1	14	**0.014S**	
		Dexmedetomidine	50	79.4	12.9		
	HR 0th minute	Dexamethasone	50	95.8	17.7	**0.023S**	
		Dexmedetomidine	50	88.5	13.3		
	HR 2nd minute	Dexamethasone	50	90.8	14.9	**0.072NS**	
		Dexmedetomidine	50	85.6	13.3		
	HR 5th minute	Dexamethasone	50	94.6	14.7	**0.0013HS**	
		Dexmedetomidine	50	86	13.6		
Systolic BP	SBP Pre nebulization	Dexamethasone	50	124.6	16.6	**0.118NS**	**<0.001 S**
		Dexmedetomidine	50	129.5	14.1		
	SBP Post nebulization	Dexamethasone	50	124.2	14.9	**0.458NS**	
		Dexmedetomidine	50	122.1	14.1		
	SBP Before intubation	Dexamethasone	50	106.1	16.1	**0.679NS**	
		Dexmedetomidine	50	104.7	16.1		
	SBP 0th minute	Dexamethasone	50	136.6	28.1	**0.082NS**	
		Dexmedetomidine	50	127.3	24.5		
	SBP 2nd minute	Dexamethasone	50	128.2	17.4	**0.007HS**	
		Dexmedetomidine	50	118.1	18.8		
	SBP 5th minute	Dexamethasone	50	118.3	16.3	**0.065NS**	
		Dexmedetomidine	50	112.2	16.7		
Diastolic BP	DBP Pre nebulization	Dexamethasone	50	78	13.6	**0.401NS**	**0.182 NS**
		Dexmedetomidine	50	80.1	11.2		
	DBP Post nebulization	Dexamethasone	50	76.7	11	**0.843NS**	
		Dexmedetomidine	50	76.2	11.2		
	DBP Before intubation	Dexamethasone	50	65.8	12.4	**0.822NS**	
		Dexmedetomidine	50	65.2	13.2		
	DBP 0th minute	Dexamethasone	50	86.8	21	**0.334NS**	
		Dexmedetomidine	50	83	18.3		
	DBP 2nd minute	Dexamethasone	50	80.2	14	**0.066NS**	

		Dexmedetomidine	50	75.1	13.8		
	DBP 5th minute	Dexamethasone	50	74.2	13	**0.314NS**	
		Dexmedetomidine	50	71.5	13.6		
MAP	MAP Pre nebulization	Dexamethasone	50	94	13.9	**0.32NS**	
		Dexmedetomidine	50	96.6	11.8		
	MAP Post nebulization	Dexamethasone	50	93.1	10.7	**0.644NS**	
		Dexmedetomidine	50	92.1	11.7		
	MAP Before intubation	Dexamethasone	50	79.5	13.3	**0.694NS**	
		Dexmedetomidine	50	78.5	13		
	MAP 0th minute	Dexamethasone	50	103.8	21.5	**0.232NS**	**0.006 S**
		Dexmedetomidine	50	98.7	20.7		
	MAP 2nd minute	Dexamethasone	50	97.1	14.6	**0.004HS**	
		Dexmedetomidine	50	88.6	14.2		
	MAP 5th minute	Dexamethasone	50	89.9	13.2	**0.121NS**	
		Dexmedetomidine	50	85.5	15.1		
Student-t test applied, S=Significant, NS=Not significant, HS=Highly significant							

Discussion

Endotracheal intubation is routinely performed during general anaesthesia to ensure mechanical ventilation in patients undergoing various surgeries. It is safe for the patients and convenient for the anaesthesiologist to manage the airway of the patient. However it is also recognized as a leading cause of mucosal injury to the airway, which frequently leads to postoperative sore throat (POST). [1]

Postoperative sore throat (POST) is a common but unpleasant consequence of endotracheal intubation, with incidence rates ranging from 21-65 %.Typically peaking 2-6 hours after extubation, POST lasts on average for 16±11 hours. Ranked as the eighth most frequent postoperative complication, it significantly impacts patient well-being, satisfaction and quality of perioperative care. [6] It is theorized that postoperative sore throat, hoarseness and cough result from mucosal irritation, inflammation and nerve damage caused by airway manipulation (such as laryngoscopy and suctioning) or the presence of foreign objects like endotracheal tubes. Intubation can lead to trauma to oropharynx, base of tongue, posterior pharyngeal wall or inflammation secondary to allergy to any component of the airway devices. Trauma to vocal cords may cause hoarseness of voice. Careful insertion of tracheal tubes is crucial to prevent airway trauma and postoperative throat discomfort. POST is also influenced by tube size and cuff design.

The drying effect of un-humidified gases further exacerbates these symptoms. The increase in cuff pressure, increased by the diffusion of inhalational agents is reported to result in formation of local mucosal lesion. [6,7,8]

Dexamethasone, a potent corticosteroid which has 26.6 and 6.6 times stronger anti-inflammatory and immunosuppressive action than cortisol and prednisone respectively is reported to be effective in treatment of sorethroat and decreasing the edema in the airway after traumatic intubation. It is also known for its analgesic and antiemetic benefits. [9]

Studies have investigated the efficacy of prophylactic dexamethasone administration in reducing the incidence and severity of sore throat, hoarseness and cough post operatively. [2,10,11,12,13]

Dexmedetomidine is a highly selective alpha -2 adrenergic agonist. It has anxiolytic, sedative and analgesic properties. It produces significant reduction in the levels of serum IL-6,IL-8 and TNF alpha post operatively. It is also known to attenuate pressor response to laryngoscopy and intubation. [4,14]

Dexmedetomidine is a highly lipid soluble agent with good systemic absorption on transmucosal administration. When given as nebulization preoperatively it reduces the incidence of postoperative sore throat. [5]

Administration via nebulization offers several advantages over gargling or Intravenous methods. Nebulization converts liquid medications into inhalable droplets,

Ensuring uniform distribution across the pharynx. This method requires lower doses for effective local action, simplifies administration, and enhances patient comfort, avoiding issues like taste aversion or the need for active patient participation seen with gargling.

Moreover, nebulization minimizes the risk of aspiration or systemic toxicity associated with high-volume liquid administration. [6] But the number of studies reporting its use in preventing postoperative sore throat are limited .Hence we planned this study to compare the effectiveness of nebulized dexamethasone with nebulized dexmedetomidine in preventing post-operative sore

throat in patients undergoing general endotracheal anaesthesia.

Effect on POST

In the study conducted by Ben M et al(2), the incidence of POST in the Dexamethasone group was 20.8% at 0th hour, 20.8% at 2nd hour, 16.7% at 6th hour, 8.3% at 12th hour and 4.2% at 24th hour. The higher incidence of POST in our study may be attributed to the preponderance of female subjects and requirement of Ryle's tube insertion for most of the surgeries. In the study conducted by Sharma S et al [15], the incidence of POST in the group which received nebulized dexamethasone was 18% at 24th hour which is comparable with our study.

In the study conducted by George N et al [16], who used intravenous Dexamethasone the incidence of POST in dexamethasone group was 12.5% at 1st hour, 32% at 6th hour and 17.5% at 24th hour. The incidence of POST is comparable to our Study in 6th and 24h hour in the study conducted by Bagchi et al [10], the incidence of POST was significantly lower at 1st (18.8%)and 6th (27.1%)hour post extubation and significantly reduced severity of POST at 24th hour (mild-29.2%); Park et al [17], reported that with prophylactic use of dexamethasone 0.2mg/kg over 0.1mg/kg significantly decreased the incidence of sore throat at 1st hr after extubation by 22% and 42% respectively and dexamethasone 0.2mg/kg decreased the incidence of sore throat at 24th hour by 30%.Our study indicates nebulized dexamethasone as effective as intravenous use for prevention of POST.

In the study conducted by Pradian E et al [14], the incidence of POST was 24% at 1st hour, 18% at 2nd hour, 14% at 4th hour, 7% at 6th hour, and 0 at 12th and 24th hour with none of them having sore throat of severe grade in the nebulized dexmedetomidine Group.

In the study conducted by Thomas D et al [5], the incidence of POST was 10.2% At 0th hour, 20.4% at 2nd hour, 10.2% at 4th, 6th, 12th and 24th hour with severity of sore throat being significantly lower at all the time intervals in the nebulized Dexmedetomidine group.

In the study conducted by Ittoop A L et al [6], the incidence of POST was 29.5% at 2nd hour, 22.7% at 6th hour, 11.4% at 12th hour and 2.3% at 24th hour with greater incidence of mild grade sore throat at all the time intervals in the nebulized Dexmedetomidine group.

In the study conducted by Vazhakalayil S T J et al [18],the incidence of POST was 100% at 2nd hour, 96.6% at 4th hour, 63.3% at 6th hour, 23.3% at 12th hour and 6.6% at 24th hour, with severity of POST significantly less from 4th to 24th hour postoperatively. The overall incidence of POST in general population is 21-65% whereas in our study the incidence of POST was found to be 16% at the end of 24th hour which is lesser in comparison. Similar results was observed in a study conducted by Thomas D et al [5]

Comparison of incidence and severity of POST among dexamethasone and Dexmedetomidine group:

The incidence of POST at was comparable among the two groups at 0th, 2nd, 12thand 24th postoperatively. At 6th hour post extubation the incidence of sore throat was significantly higher in dexmedetomidine group (48%) compared to dexamethasone Group (28%) with a p value of 0.038. There was no statistically significant difference in the severity of POST among the two groups at all time intervals in the study.

There are no studies reporting the comparison of incidence and severity of POST using nebulized dexamethasone and nebulized dexmedetomidine preoperatively.

Effect on Hemodynamic stress response

At 2nd minute post-intubation, the MAP was 97.1mmhg in dexamethasone group had a compared to 88.6mmhg in dexmedetomidine group which was statistically significant with p value of 0.004.Overall MAP remained within normal limits.

Thus we observed nebulized dexmedetomidine is effective in attenuating the Hemodynamic stress response to laryngoscopy and intubation which is comparable to the following study results.

a) Kumar et al(2020)[19], in their study concluded that nebulised dexmedetomidine (1 mcg/kg) effectively blunts the stress response to laryngoscopy and intubation and with no adverse effects.

b) Grover et al (2023) [20], compared nebulised forms of fentanyl (1mcg/kg), Dexmedetomidine (1mcg/kg) and magnesium sulphate(40mg/kg) to attenuate the Haemodynamic response to laryngoscopy and tracheal intubation. Noticed at 2 min Post-intubation, magnesium and dexmedetomidine showed a statistically significant Decrease in all the values from baseline ($P < 0.001$), similar to our study.

c) Gupta et al(2023) [21], in their meta-analysis (involving 6 RCTs which used nebulized Dexmedetomidine in the dosage of 1mcg/kg except one RCT which used 2mcg/kg preoperatively), reported that dexmedetomidine nebulization significantly reduces HR and BP response to laryngoscopy and endotracheal intubation without any risk of adverse effects like bradycardia and

hypotension. Pressor response to tracheal intubation is due to rise in plasma catecholamines concentration which is maximum at 1st minute and persists upto 3minutes. In our study we noted nebulized Dexmedetomidine attenuated the intubation response to endotracheal intubation at the 2nd minute with hemodynamic parameters maintained below the baseline till 5th minute post-intubation.

Therefore, both nebulized dexamethasone and nebulized dexmedetomidine are equally efficacious in reducing the incidence and severity of POST after general endotracheal anaesthesia, with nebulized dexmedetomidine having an added advantage of attenuating the hemodynamic stress response to laryngoscopy and endotracheal intubation.

Limitations

The dose we used for both the groups were fixed and not customised for the patient. Assessment of POST beyond 24 hour postoperative period was not done. This would have helped to calculate the mean duration of POST and detect any late onset POST. The total amount of analgesic and anaesthetic agents used during the study period was not recorded.

Conclusion

From the present study it is concluded that, nebulized dexmedetomidine (50 mcg in total volume of 5 ml)given preoperatively 15 minutes before induction of anaesthesia is as efficacious as nebulized dexamethasone(8mg in a total volume of 5 ml)given preoperatively in reducing the incidence of postoperative sore throat after general endotracheal anaesthesia with additional advantage of attenuating the pressor response to laryngoscopy and intubation .

References:

1. El-Boghdadly K, Bailey CR, Wiles MD. Postoperative sore throat: a systematic Review. Anaesthesia. 2016 Jun;71(6):706-17. Doi: 10.1111/anae.13438. Epub 2016 Mar 28. PMID: 27158989.
2. Ben M, Zainab Mostafa Attia, Mohmd A, Mohamed M. Effect of Nebulized Dexamethasone versus Nebulized Ketamine on Postoperative Sore Throat after Thyroid Surgeries. The Egyptian Journal of Hospital Medicine. 2022 Apr 1;87(1):1613–8.
3. Mazzotta E, Soghomonyan S, Hu LQ. Postoperative sore throat: prophylaxis And treatment. Front Pharmacol. 2023 Nov 23;14:1284071. Doi: 10.3389/fphar.2023.1284071. PMID: 38074131; PMCID: PMC10701272.
4. Liu Y, Ai D, Wang X. Efficacy of perioperative intravenous dexmedetomidine Administration for the prevention of postoperative sore throat: a meta-analysis. J Int Med Res. 2021 May;49(5):300060521101 7686. Doi: 10.1177/03000605211017686. PM ID: 34044638; PMCID: PMC8165843.
5. Thomas D, Chacko L, Raphael PO. Dexmedetomidine nebulisation attenuates Post-operative sore throat in patients undergoing thyroidectomy: A randomised, Double-blind, comparative study with nebulised ketamine. Indian J Anaesth. 2020 Oct;64(10):863-868. Doi: 10.4103/ija.IJA_406_20. Epub 2020 Oct 1. PMID: 33437074; PMCID: PMC7791420.
6. Ittoop AL, Gupta P, Jain G, Tyagi N, Eda J, Shajahan S. Reduction in Postoperative sore throat by preoperative nebulization with dexmedetomidine, Ketamine or saline: A prospective, randomized-controlled trial. J Anaesthesiol Clin Pharmacol. 2023 Apr-Jun;39(2):201-207. Doi: 10.4103/joacp.joacp_245_21. Epub 2023 Apr 25. PMID: 37564855; PMCID: PMC10410028.
7. McHardy FE, Chung F. Postoperative sore throat: cause, prevention and Treatment. Anaesthesia. 1999 May;54(5):444-53. Doi: 10.1046/j.1365-2044.1999.00780.x. PMID: 10995141.
8. Yang, Na & Tao, Qingyu & Niu, Jingyi & Yu, Junma. (2023). Postoperative Sore Throat after General Anesthesia: A Narrative Review. Journal of Anesthesia and Translational Medicine. 2. 34. 10.58888/2957-3912-2023-03-05.
9. Lee SH, Lee YC, Lee JH, Choi SR, Lee SC, Lee JH, et al. The prophylactic Effect of dexamethasone on postoperative sore throat in prone position surgery. Korean Journal of Anesthesiology. 2016;69(3):255.
10. Bagchi D, Mandal MC, Das S, Sahoo T, Basu SR, Sarkar S. Efficacy of Intravenous dexamethasone to reduce incidence of postoperative sore throat: A Prospective randomized controlled trial. J Anaesthesiol Clin Pharmacol 2012;28:477-80.
11. Subedi A, Tripathi M, Pokharel K, Khatiwada S. Effect of Intravenous Lidocaine, Dexamethasone, and Their Combination on Postoperative Sore Throat: A Randomized Controlled Trial. Anesth Analg. 2019 Jul;129(1):220- 225. Doi: 10.1213/ANE.0000000000003842. PMID: 30320641.
12. Kuriyama A, Maeda H. Preoperative intravenous dexamethasone prevents Tracheal intubation-related sore throat in adult surgical patients: a systematic Review and meta-analysis. Can J Anaesth. 2019 May;66(5):562-

575. English. Doi: 10.1007/s12630-018-01288-2. Epub 2019 Jan 7. PMID: 30617677.
13. Ki S, Myoung I, Cheong S, Lim S, Cho K, Kim MH, Han Y, Oh M, Park Y, Kim K, Lee J. Effect of dexamethasone gargle, intravenous dexamethasone, and their Combination on postoperative sore throat: a randomized controlled trial. Anesth Pain Med (Seoul). 2020 Oct 30;15(4):441-450. Doi: 10.17085/apm.20057. PMID: 33329847; PMCID: PMC7724117.
14. Pradian E, Kestriani SS ND, Ritonga DZ. Nebulized dexmedetomidine for Preventing postoperative sore throat after tracheal intubation: a randomized, Double-blind clinical trial. Anaesth. Pain intensive care 2023;27(6):737−744.
15. Sharma, S., Bhardwaj, V., Sharma, S. et al. Dexamethasone to decrease post-Anesthesia sore throat (POST) and hoarseness-which is the most effective route: Intravenous, topical, or nebulization? A prospective randomized trial. Ain-Shams J Anesthesiol 13, 26 (2021).
16. George, N., & Mathew, S. (2020). Comparative study of prophylactic Dexamethasone versus placebo for reducing post-operative sore throat after Tracheal intubation: a prospective, randomised, double blinded clinical study. International Journal of Research in Medical Sciences, 8(7), 2583–2588.
17. Park SY, Kim SH, Lee AR, Cho SH, Chae WS, Jin HC, Lee JS, Kim YI. Prophylactic effect of dexamethasone in reducing postoperative sore throat. Korean J Anesthesiol. 2010 Jan;58(1):15-9. Doi: 10.4097/kjae.2010.58.1.15. Epub 2010 Jan 31. PMID: 20498806; PMCID: PMC2872887.
18. Vazhakalayil STJ, Kore S, Joey A, Palal D. Preoperative Nebulisation with Dexmede tomidine to Prevent Postoperative Sore Throat in Patients Undergoing General Anaesthesia. Journal of Clinical and Diagnostic Research [Internet]. 2023 [cited 2024 Jul 31];
19. Kumar NRR, Jonnavithula N, Padhy S, Sanapala V, Naik VV. Evaluation of Nebulised dexmedetomidine in blunting haemodynamic response to intubation: A prospective randomised study. Indian J Anaesth. 2020 Oct;64(10):874-879. Doi: 10.4103/ija.IJA_235_20. Epub 2020 Oct 1. PMID: 33437076; PMCID: PMC7791430.
20. Grover N, Taneja R, Rashid Y, Shrivastava N. Nebulised fentanyl, Dexmedetomidine and magnesium sulphate for attenuation of haemodynamic Response to laryngoscopy and tracheal intubation: A double-blinded, Randomised comparative study. Indian J Anaesth. 2023 Aug;67(8):730-735. Doi: 10.4103/ija.ija_397_22. Epub 2023 Aug 15. PMID: 37693019; PMCID: PMC10488584.
21. Gupta M, Rohilla R, Gupta P, Tamilchelvan H, Joshi U, Kanwat J. Nebulized dexmedetomidine for attenuating hemodynamic response to laryngoscopy and endotracheal intubation in adult patients undergoing surgeries under general anaesthesia: a systematic review and meta-analysis of randomized controlled trials. BMC Anesthesiol. 2023 Dec 11;23(1):406. Doi: 10.1186/s12871-023-02366-9. PMID: 38082217; PMCID: PMC10712167.