e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15(8); 952-959

Original Research Article

A Study on the Reduction of Postoperative Sore Throat and Hoarseness of Voice on Endotracheal Tube Cuff Lubrication with Betamethasone Gel and Lidocaine Jelly

Harishankar[1], Dhanya R.[2], Neetha C.[3]

[1]Senior Resident, Department of Anaesthesiology, Government Medical College, Thiruvananthapuram, Kerala, India.

[2]Additional Professor, Department of Anaesthesiology, Government Medical College, Thiruvananthapuram, Kerala, India.

[3]Assistant Professor, Department of Anaesthesiology, Government Medical College, Thiruvananthapuram, Kerala, India.

Received: 04-06-2023 / Revised: 08-07-2023 / Accepted: 03-08-2023

Corresponding author: Dr. Dhanya R.

Conflict of interest: Nil

Abstract:

Background: This study was conducted to evaluate and compare the efficiency of lubricating the endotracheal tube cuff with 0.05% betamethasone gel and 2% lignocaine gel in reducing the incidence of commonly occurring complications following endotracheal intubation for general anaesthesia.

Methods: This was a hospital-based prospective observational study conducted among 122 patients who had undergone elective surgeries at the Department of Anaesthesia at Government Medical College Hospital, Super Speciality Theatres, Thiruvananthapuram, for a period of one year, after obtaining clearance from the institutional ethics committee and written informed consent from the study participants.

Results: The overall incidence of postoperative sore throat was significantly lower in the betamethasone group with 33 patients (54.1%) when compared to the lignocaine group with 50 patients (82%). The incidence of no sore throat, mild, moderate, and severe postoperative sore throat at 1 hour after extubation in betamethasone group was 47.5%, 45.9%, 6.6% and 0% respectively, compared to lignocaine group, which was 18%, 50.8%, 23.0% and 5% respectively. The incidence of no sore throat, mild, moderate, and severe postoperative sore throat at 6 hours after extubation in betamethasone group was 78.3%, 2%, 1.7% and 0% respectively compared to lignocaine group which was 32.8%, 54.1%, 6.6% and 6.6% respectively. The incidence of no sore throat, mild, moderate, and severe postoperative sore throat at 24 hours after extubation in betamethasone group was 77.0%, 21.3%, 1.6% and 0% respectively compared to lignocaine group was 36.1%, 49.2%, 8.2% and 6.6% respectively. The incidence of sore throat was lower in the betamethasone group than in the lignocaine group at intervals of 1, 6, and 24 hours post extubation, which was statistically significant. The incidence of no HOV, grade 1 HOV, grade 2 HOV, and grade 3 HOV in betamethasone group was 47.5%, 49.2%, 3.3% and 0% respectively compared to lignocaine group which was 26.2%, 44.3%, 26.2% and 3.3% respectively, which was statistically significant.

Conclusion: Application of betamethasone gel preoperatively on the endotracheal tube cuff in elective surgeries under general anaesthesia significantly decreases postoperative sore throat in comparison to the application of lignocaine gel on the endotracheal tube cuff.

Keywords: Reduction, Postoperative, Sore Throat, Hoarseness, Voice, Endotracheal Tube, Cuff Lubrication, Betamethasone Gel, Lidocaine Jelly.

Introduction

Management and care of the airway play a pivotal role in the practice of anaesthesia and this involves the whole range of airway manipulations used along the course of conduction of anaesthesia. Endotracheal intubation forms an integral and unassailable part of airway management in any case of general anaesthesia or emergency management of critical care events. Endotracheal intubation is commonly done with a cuffed endotracheal tube as the pressured cuff prevents aspiration ofsecretions into the lower respiratory tract. But common adverse effects of the cuffed endotracheal tube like local irritation, inflammation of the airway mucosa etc. lead to post-extubation morbidities such as sore throat, cough, and hoarseness of voice,which are extremely distressing to the patient. The incidence of postoperative complications (sore throat, hoarseness, and cough) is highest after tracheal intubation and usually varies between 30% and 70%.[1,2] This high variability is attributed to

the number of factors implicated in post-operative sore throat, such as type of airway device, technique and expertise of insertion, use and type of lubricant used, cuff pressure, length of procedure, humidification of anaesthetic gases, and evaluation or interview techniques. Post-operative sore throat was rated as the 8th most undesirable outcome in the postoperative period.[3] Even though the symptoms resolve spontaneously without any treatment, prophylactic management to decrease their frequency and severity is paramount to improving the postoperative outcome. A multimodal approach that consists of both non-pharmacological and pharmacological interventions has been advocated and studied to attenuate post-operative sore throat. Small-sized endotracheal tubes, high-volume, low-pressure cuff endotracheal tubes, optimizing intracuff pressure, lubrication of the endotracheal tube or its cuff with local anaesthetics or steroids, intravenous administration of lidocaine or dexamethasone, preinduction inhalation of beclomethasone, ketamine gargle etc. are some of the strategies recommended to reduce post-operative sore throat. Identification of factors associated with an increased risk of tracheo-pharyngeal complications will allow anaesthesia providers to avoid any controllable factors and thus decrease the overall incidence of post-operative sore throat and improve patient outcomes in this era of increasing quality assurance in anaesthesia practice. Local anaesthetic agents such as lignocaine gel or spray were widely studied and are still extensively used. Ketamine, an NMDA antagonist with anti-nociceptive and anti-inflammatory properties, has been found to be effective in preventing post-operative sore throat and is thought to be due to its action on peripherally located NMDA receptors, thereby reducing inflammation and pain.[4,5] The use of steroids in attenuating post-operative sore throats, as they have anti-inflammatory effects has a promising outlook and several studies have described the use of inhaled and topical steroids.[6,7,8,9,10] While lignocaine gel is still extensively used for lubrication and attenuating post-operative sore throats, its lack of post-operative anti-inflammatory activity makes it less advantageous in practice. On the other hand, Stride et al.[11] reported that topical hydrocortisone could increase the frequency of post-operative sore throat, while 10% lidocaine has been shown to increase the incidence of post-operative sore throat by Hung N. K., Wu C. T. et al. In view of these uncertainties about the effects of the commonly used lignocaine gel and lesser used steroid local application in reducing post-operative sore throat, the present study aims to compare and evaluate the efficiency of lidocaine 2% gel and betamethasone 0.05% gel in reducing post-operative sore throatand hoarseness of voice.

Aims and Objectives

- To evaluate and compare the efficiency of lubrication of the endotracheal tube cuff with 0.05% betamethasone gel and 2% lignocaine gel in reducing the incidence of commonly occurring complications following endotracheal intubation for general anaesthesia. We compared the following two groups: The betamethasone group received betamethasone gel over the endotracheal tube cuff and the lignocaine group received lignocaine jelly over the endotracheal tube cuff.
- To analyse the effect of endotracheal cuff lubrication on post-operative sore throat and hoarseness of voice using betamethasone gel and lidocaine jelly.
- To identify factors affecting postoperative sore throat and hoarseness of voice, such as duration of surgery, position used in surgery and type of endotracheal tube etc.

Methods

This was a hospital-based prospective observational study conducted among 122 patients who had undergone elective surgeries at the Department of Anaesthesia at Government Medical College Hospital, Super Speciality Theatres, Thiruvananthapuram, for a period of one year, after obtaining clearance from the institutional ethics committee and written informed consent from the study participants.

Inclusion Criteria

ASA 1 and 2 patients undergoing surgery under GA with oral endotracheal tube intubation, surgery of more than one-hour duration but less than 4 hours.

Exclusion Criteria

- Those who are not willing to give consent.
- Predicted difficult airway patient's MP Class 4
- Tracheal incubation attempts greater than two in number.
- Patients with a preoperative sore throat or hoarseness of voice including heavysmokers.

Sample Size

Formula for calculating sample size

$$N= \frac{\{z_{1-a/2}\sqrt{2p(1-p)}+z_{1-\beta}\sqrt{p_1(1-p_1)+p_2(1-p_2)}\}^2}{(p_1-p_2)^2}$$

Where,

$$P= \frac{p_1+p_2}{2}$$

P_1: Proportion in the first group
P_2: Proportion in the second group
α: Significance level =5%
$1-\beta$: Power =80%

According to the similar study "Controlled Comparison between Betamethasone Gel and Lidocaine Gel Applied over Tracheal Tube" by P. A. Sumathi et al., the proportion of incidence of sore throat in group A was 40% and that in the group B was 65%.

Here
P_1: Proportion in the first group =40%
P_2: Proportion in the second group =65%
α: Significance level =5%
1-β: Power =80%

N= 61 in each group

Statistical Analysis

The data was entered into an Excel sheet. Quantitative variables were described by mean, SD, minimum, maximum, and quartiles, and qualitative variables were described by frequency distribution. Between groups, comparison of quantitative variables was analysed by independent sample 't' test or Mann-Whitney U test, according to the nature of the data. Between groups, comparisons of qualitative variables were analysed by the chi-square test. A p-value of 0.05 was taken as the level of significance. SPSS version 17.0 was used for the statistical analysis.

Results

Table 1: Demographic Distribution

	Betamethasone Group		Lignocaine Group	
	N	%	N	%
<25	12	19.7	6	9.8
26-30	9	14.8	14	23.0
31-35	7	11.5	8	13.1
>35	33	54.1	33	54.1
Total	61	100.0	61	100.0
Age Distribution				
χ^2 =3.154 df=1 p=0.369				
	Betamethasone Group		**Lignocaine Group**	
	N	**%**	**N**	**%**
Male	30	49.2	31	50.8
Female	31	50.8	30	49.2
Total	61	100.0	61	100.0
Sex Distribution				
χ^2 =0.033 df=1 p=0.856				

When compared statistically, the differences in age groups in the two groups werenot found to be significant (p=0.369). The two groups were demographically comparable with respect to age.

Of the total 61 patients in the betamethasone group, 30 (49.2%) were male and 31 (50.8%) were female. Of the total 61 patients in the lignocaine group. 31 (50.8%) were male and 30 (49.2%) were female. When compared, the difference between the two groups was not found to be statistically significant (p=0.856). Hence, the two groups are demographically comparable.

Table 2

Sore Throat at 1 hr.	**Betamethasone**		**Lignocaine**	
	N	**%**	**N**	**%**
Nil	29	47.5	11	18.0
Mild	28	45.9	31	50.8
Moderate	4	6.6	14	23.0
Severe	0	0.0	5	8.2
Total	61	100.0	61	100.0
The Incidence of Sore Throat at 1 hr. Post Extubation				
χ^2 =18.808 df=3 p<0.001				
Sore Throat at 6 hr.	**Betamethasone**		**Lignocaine**	
	N	**%**	**N**	**%**
Nil	47	78.3	20	32.8
Mild	12	20.0	33	54.1
Moderate	1	1.7	4	6.6
Severe	0	0.0	4	6.6
Total	60	100.0	61	100.0
The Incidence of Sore Throat at 6 hr. Post Extubation				
χ^2 =26.474 df=3 p<0.001				

Patients in the betamethasone group with no sore throat were 47.5% whencompared to 18% in the lig-

nocaine gel group, mild sore throat was 45.9% when compared to 50.8%, moderate sore throat was 6.6% compared to 23% and severe sore throat was 0% compared to 8.2% respectively, at 1 hour after extubation. The incidence of sore throat was lower in the betamethasone group than in the lignocaine group, which was statistically significant with a p-value less than 0.001.

Patients in the betamethasone group with no sore throat were 78.3% when compared to 32.8% in the lignocaine gel group; mild sore throat was 20% when compared to 54.1%; moderate sore throat was 1% compared to 6.6% and severe sore throat was 0% compared to 6.6% respectively, at 6 hours after extubation. The incidence of sore throat was lower in the betamethasone group than in the lignocaine group, which was statistically significant with a p-value less than 0.001.

Table 3

Sorethroat at 24 hr	Betamethasone		Lignocaine	
	N	%	N	%
Nil	47	77.0	22	36.1
Mild	13	21.3	30	49.2
Moderate	1	1.6	5	8.2
Severe	0	0.0	4	6.6
Total	61	100.0	61	100.0
The Incidence of Sore Throat at 24 hr. Post Extubation				
χ^2 =22.446 df=3 p<0.001				
Hoarseness of Voice	**Betamethasone**		**Lignocaine**	
	N	**%**	**N**	**%**
Grade 0	29	47.5	16	26.2
Grade 1	30	49.2	27	44.3
Grade 2	2	3.3	16	26.2
Grade 3	0	0.0	2	3.3
Total	61	100.0	61	100.0
The Incidence of Hoarseness of Voice (HOV) Post Extubation				
χ^2 =16.802 df=3 p=0.001				

Patients in the betamethasone group with no sore throat were 77% when compared to 36.1% in the lignocaine gel group, mild sore throat was 21.3% when compared to 49.2%, moderate sore throat was 1% compared to 8.2% and severe sore throat was 0% compared to 6.6% respectively, at 24 hours after extubation. The incidence of sore throat was lower in the betamethasone group than in the lignocaine group, which was statistically significant with a p value less than 0.001. The incidence of sore throat was lower in the betamethasone group than in the lignocaine group at intervals of 1, 6 and 24 hours post-extubation, which was statistically significant with a p-value less than 0.05.

Patients in the betamethasone group with grade 0 hoarseness of voice (i.e., no evidence of hoarseness at any time since the surgery) were 47.5% when compared to 26.2% in the lignocaine group, grade 1 HOV (i.e., no evidence of hoarseness at the time of interview) was 49.2% compared to 44.3%; grade 2 HOV (i.e., hoarseness at the time of interview noted by the patient only) was 3.3% compared to 26.2%; and grade 3 HOV (i.e., hoarseness that is easily noted at the time of interview) was 0% compared to 3.3%, respectively. This was statistically significant, with a p-value less than 0.05 (p = 0.001).

Table 4

Age (Lignocaine)	Sore Throat				Total		χ^2	df	p
	Present		Absent						
	N	%	N	%	N	%			
<25	3	6.0	3	27.3	6	9.8	8.117	1	0.044
26-30	12	24.0	2	18.2	14	23.0			
31-35	5	10.0	3	27.3	8	13.1			
>35	30	60.0	3	27.3	33	54.1			
Total	50	100.0	11	100.0	61	100.0			
Age Wise Incidence of Sore Throat in Lignocaine Group									
Type (Lignocaine)	**Sore throat**				**Total**		χ^2	**df**	**p**
	Present		**Absent**						
	N	**%**	**N**	**%**	**N**	**%**			
Flexo Metallic	21	42.0	1	9.1	22	36.1	4.235	1	.040

Normal	29	58.0	10	90.9	39	63.9			
Total	50	100.0	11	100.0	61	100.0			
Incidence of Sore Throat Compared against Type of Tube in Lignocaine Group									

Age-wise, the incidence of sore throat in the lignocaine group showed a higher incidence in people over 35 years of age (60%). The results were statistically significant, with a p value of 0.044.
In the lignocaine group, the incidence of sore throat in patients who had flexometallic ETT inserted was 42% compared to 58% in those who had normal ETT.

Discussion

Many of the general anaesthetic procedures in modern anaesthesia practice are carried out with endotracheal intubation and its use in emergency management of the airway is indisputable. Postoperative sore throat is a well-documented complication after general anaesthesia and is rated by patients as the 8th most undesirable outcome in the postoperative period. Even though the symptoms resolve spontaneously without any treatment, they can lead to pathological conditions like vocal cord hematomas and granulomas. Prophylactic management to decrease its frequency and severity is still recommended for improving the quality of post-anaesthesia care.

Postoperative sore throat is a board description representing a wide constellation of signs and symptoms of laryngitis, tracheitis, hoarseness, cough or dysphagia with an incidence varying from 14.4% to 100% following endotracheal intubation.

A multimodal approach consisting of non-pharmacological and pharmacological interventions has been researched to attenuate POST. Identification of the factors associated with an increased risk of postoperative sore throat will allow anaesthesiologists to avoid combinations of controllable factors, thus decreasing the incidence of postoperative sore throat and improving patient anaesthetic outcomes.

Many pharmacological interventions, like steroids, non-steroidal anti-inflammatory drugs, local anaesthetics like lignocaine etc., have been used to attenuate postoperative sore throats by various authors. But all such manoeuvres had their own advantages and disadvantages.

The present study was undertaken to compare the effects of betamethasone gel and lignocaine gel lubrication of ETT cuffs on attenuating postoperative sore throat after endotracheal intubation under general anaesthesia.

The study population consists of 122 patients undergoing elective surgeries with endotracheal intubation under general anaesthesia who were divided into two groups of 61 each, one receiving betamethasone gel lubrication of the ETT cuff and the other receiving lignocaine gel lubrication of the cuff.

Studies done on betamethasone.

- A randomized double blind clinical trial by Ayoub C. M., Ghobashy A., Koch M. E., et al. (1998) in 87 subjects showed that 0.05% betamethasone gel was effective in decreasing the frequency of sore throat and hoarseness but ineffective in reducing cough at 24 hours.
- A randomized double-blind study by Selvaraj T., Dhanapala R., et al. (2002) in 75 subjects showed betamethasone gel significantly reduced the incidence of post-operative sore throat, cough and hoarseness of voice.
- A prospective, randomized, double blinded controlled study by Sumathy P. A., Shenoy T., Ambareesha M., et al. (2008) in 150 subjects showedbetamethasone gel applied to the tracheal tube cuff was more effective at significantly reducing post-operative sore throat, cough and hoarseness when compared to lignocaine and a control group.
- A randomized double-blind clinical trial by Asif Kazemi and Afshin Amini (2007) in 100 subjects showed that 0.05% betamethasone gel was effective in decreasing post-operative sore throat, cough and hoarseness.

All four authors showed attenuation of postoperative sore throats after betamethasone application over the tracheal tube.

The study by Ayoub et al. in 1998[6] confirmed the relatively high incidence of pharyngo-laryngo-tracheal sequelae after general anaesthesia with laryngoscopy and tracheal intubation. Application of betamethasone to the portions of the endotracheal tube that make contact with the posterior pharyngeal wall, vocal cords, and trachea markedly reduces sore throat, hoarseness and cough. This can be attributed to decreased inflammation and oedema as a result of local steroid application. The beneficial effect of steroids is consistent with the fact that endotracheal tubes and their cuffs may cause local irritation with pharyngeal, laryngeal and tracheal inflammation. Virtually all tracheal intubations are associated with laryngeal changes that affect the voice-frequency histogram[12,13] even if they do not cause discernible hoarseness. The use of topical steroids was more effective than topical or aerosolized lidocaine[14] in the prevention of symptoms suggestive of local irritation. They had come to the conclusion that the severity and likelihood of laryngotracheal sequelae in patients can be markedly reduced by applying betamethasone as a topical steroid cream so that it covers all the major points of contact with the pharynx, larynx and trachea.

The study by Sumathy et al. in 2008 found that the

incidence of postoperative sore throat, cough and hoarseness of voice was significantly lower with the wide application of betamethasone gel over the tracheal tube compared with lidocaine jelly or nothing applied over the tube. Lidocaine jelly reduced the incidence of postoperative sore throat but not cough or hoarseness compared with the control group.

The incidence of postoperative sore throat, cough and hoarseness of voice is distressingly high. Many factors including the diameter of the tracheal tube, cuff design and pressure, intubation procedure, movement of the tracheal tube during the surgery, bucking or coughing on the tube, and excessive pharyngeal suctioning during extubation have been described to influence the incidence of these.[15] Recognising the potential role of inflammation in these postoperative airway sequelae, the use of inhaled and topical steroids was described.

The study by Asif Kazemi et al. in 2007 observed that the application of betamethasone gel on the tracheal tube preoperatively reduces the incidence of postoperative sore throat, cough and hoarseness of voice after endotracheal intubation. They found that betamethasone gel was ineffective in preventing cough in the first hour after surgery but effective in the 24th hour. They concluded that betamethasone gel had preventive effects on coughing and needed a 24-hour period to manifest itself.

The studies by Ayoub and colleagues and Selvaraj and Dhanpal proved that widespread application of betamethasone gel significantly reduces the incidence of postoperative sore throat, cough and hoarseness of voice. However, Ayoub and colleagues compared only the betamethasone group with the control group. The study by Sumathi et al. included a lidocaine jelly group in addition to the control group because lidocaine jelly is still widely used in clinical practice to lubricate the tracheal tube. While aerosolized lidocaine has been associated with a higher incidence of postoperative sore throat, cough and hoarseness of voice, therole of lidocaine jelly is not clear. Contrary to the findings of Sumathy et al., Selvaraj and Dhanpal found that the incidence of postoperative cough andhoarseness was higher in the lidocaine jelly group than in the control group. However, they had not standardized the extubation protocol in the groups studied, which could have affected the incidence of postoperative sore throat, cough and hoarseness.

Although Stride in 1990 concluded that topical 1% hydrocortisone water-soluble cream was ineffective in reducing the incidence of post-operative sore throat, it was realized that they had applied topical 1% hydrocortisone only from the distal tip to 5 cm above the cuff. The beneficial effects of steroid gel application were observed in subsequent studies because of the wide spread application of steroid gel to all portions of the tube that came in contact with the posterior pharyngeal wall, vocal cords and trachea and were not just confined to the tip and cuff of the tracheal tube.

The incidence of post-operative sore throat has been found to be higher when ETTs with high-pressure, low-volume cuffs are used in comparison with ETTs with low-pressure, high-volume cuffs [48]. Hence, our study used ETT tubes that have a high-volume low-pressure cuffs in all the patients.

In our study, the overall incidence of postoperative sore throat was significantly lower in the betamethasone group with 33 patients (54.1%) when compared to the lignocaine groupwith 50 patients (82%.)

Postoperative Sore Throat at 1 Hour after Extubation

In our study, the incidence of no sore throat, mild, moderate, and severe postoperative sore throat at 1 hour after extubation in the betamethasone group was 47.5%, 45.9%, 6.6% and 0% respectively, compared to the lignocaine group, which was 18%, 50.8%, 23.0% and 5% respectively.

Postoperative Sore Throat at 6 Hours after Extubation

In our study, the incidence of no sore throat, mild, moderate, and severe postoperative sore throat at 6 hours after extubation in the betamethasone group was 78.3%, 20%, 1.7% and 0% respectively, compared to the lignocaine group, which was 32.8%, 54.1%, 6.6% and 6.6% respectively.

Postoperative Sore Throat at 24 Hours after Extubation

In our study, the incidence of no sore throat, mild, moderate, and severe postoperative sore throat at 24 hours after extubation in the betamethasone group was 77.0%, 21.3%, 1.6% and 0% respectively compared to the lignocaine group, which was 36.1%, 49.2%, 8.2% and 6.6% respectively.

The incidence of sore throat was lower in the betamethasone group than in the lignocaine group at intervals of 1, 6 and 24 hours post-extubation, which was statistically significant with a p value less than 0.05. Moreover, from analysis, it's clear that betamethasone has greater action in reducing the incidence of sore throat as the duration of intubation increases, which confirms the study by Asif Kazemi et al. in 2007[36] which concluded that betamethasone gel had preventive effects on cough and needed a 24-hour period to manifest itself.

Postoperative Hoarseness of Voice (HOV) after Extubation

In our study, the incidence of no HOV, grade 1 HOV, grade 2 HOV, and grade 3 HOV in the betamethasone group was 47.5%, 49.2%, 3.3% and 0% respectively compared to the lignocaine group, which was 26.2%, 44.3%, 26.2% and 3.3%respectively, which was statistically significant with a p-

value less than 0.05.

In our study, there was a relationship between age and the occurrence of postoperative sore throat in the lignocaine group and the severity increased with age, which was statistically significant. In the betamethasone group also, the highest incidence of sore throat was seen in the above 35 age group, but it was not statistically significant. But the drawbacks regarding this finding are that to confirm the association, there was a lack of severe sore throat cases in the betamethasone group. So, increasing the sample size with further studies is being recommended. Also, on comparison of both the betamethasone and lignocaine groups in terms of duration of endotracheal intubation, we did not find any statistically significant increase in incidence of sore throat with duration of surgery. Hence, in both groups, the duration of intubation did not show a significant difference.

Comparing the betamethasone group and the lignocaine group in terms of the type of ETT, it was found that the use of flexometallic ETT did not lead to a statistically significant increase in the number of POST cases. Although flare-up of local subtle infections is a possibility with topical steroid application, there are no reports of adverse effects secondary to betamethasone gel application over the tracheal tube.

The limitation in our study was that no cuff pressure monitoring was done intra- operatively. However, as it is standardized for all the groups and kept as minimal as possible to just prevent air leaks, it is unlikely to have influenced the results. The incidence of coughing or bucking on the tracheal tube at the time of extubation was not recordedin any of the groups. Even though the extubation protocol was the same in all the groups, the correlation between coughing or bucking at the time of extubation and the incidence of sore throat, cough and hoarseness could not be evaluated in this study. Dry gases were used in the study, which could have increased the incidence of sore throat, particularly in the immediate post extubation period. However, as dry gases were used in both groups, any significant bias would have been eliminated. Thus, our study confirms the findings of studies by the above-mentioned authors, proving that application of betamethasone gel significantly reduces the incidence of postoperative sore throat and hoarseness of voice compared to application of lignocaine gel.

Conclusion

The overall incidence of postoperative sore throat was significantly lower in the betamethasone group with 54.1% when compared to the lignocaine group with 82 %. The incidence of sore throat was lower in the betamethasone group than in the lignocaine group at intervals of 1, 6, and 24 hours post-extubation, which was statistically significant with a p-value less than 0.05. There occurs a relationship between age and the occurrence of postoperative sore throat in the lignocaine group and the severity increases with age, which was statistically significant. No correlation of gender, duration of procedure, or postoperative sore throatwith respect to the betamethasone group or the lignocaine group was seen in the present study. Hence, it is concluded that application of betamethasone gel preoperatively onthe endotracheal tube cuff in elective surgeries under general anaesthesia significantly decreases postoperative sore throat in comparison to application of lignocaine gel on the endotracheal tube cuff.

References

1. McHardy FE, Chung F. Postoperative sore throat, cause, prevention and treatment. Anaesthesia 1999;54(5)444-53.
2. Tanaka Y, Nakayama T, Nishimori M, Sato Y, Furuya H. Lidocaine for preventing postoperative sore throat. Cochrane database of Systemic Reviews 2009;3 Art No: CD004081:1-40
3. Canbay O, Celebi N, Sahin A, Celiker V, Ozgen S, Aypar U. Ketamine gargle for attenuating postoperative sorethroat. BJA 2008;100(4)490-3.
4. Park SY, Kim SH, Noh JI, Lee SM, Kim MG, Kim SH, Ok SY. The effect of intravenous low dose ketamine for reducing postoperative sore throat. Korean Journal of Anaesthesiology 2010; 59(1):22-6.
5. Shrestha SK, Bhattarai B, Singh J. Ketamine gargling and postoperative sore throat. J Nepal Med Assoc 2010;50(180):282-5.
6. Ayoub CM, Ghobashy A, Koch ME, Pascale V. Widespread application of topical steroids decrease the frequency of sore throat and hoarseness and cough after tracheal intubation. Anaesth Analg 1998;87(3):714-6.
7. Sumathi PA, Shenoy T, Ambareesha M, Krishna HM. Controlled comparison between betamethasone gel and lidocaine jelly applied to tracheal tube to reduce post-operative sore throat, cough and hoarseness of voice. BJA 2008;100 (2):215-8.
8. Selvaraj T, Dhanpal R. Evaluation of application of topical steroids on theendotracheal tube reducing the incidence of post-operative sore throat. J Anaesthesiol Clin Pharmacol 2002;18(2):167-70.
9. Kazemi A, Amini A. The effect of betamethasone gel in decreasing post-operative sore throat, cough and hoarseness after laryngotracheal intubation. Middle East J Anaesthesiol 2007;19(1):197-204.
10. El-Hakim M. Beclomethasone prevents postoperative sore throat. Acta Anaesthesiol Scand 1993;37(3):250-2.
11. Stride PC. Post-operative sore throat and topical hydrocortisone. Anaesthesia 1990;45(11):968-71.
12. Priebe JH, Henke W, Hedley-Whyte J. Effects of

tracheal intubation on laryngeal acoustic waveforms. Anaesth Analg 1988;67(3):219-27.
13. Lesser T, Williams G. Laryngographic investigation of postoperative hoarseness. Clin Otolaryngol 1988;13(1):37-42.
14. Banihashem N, Alijanpour E, Hasannasab B, Zarei A. Prophylactic effects of lidocaine or beclomethasone spray on post-operative sore throat and cough after orotracheal intubation. Iran J Otorhinolaryngol 2015;27(80):179-84.
15. Mandoe H, Nikolajsen L, Lintrup U, Jepsen D, Mølgaard J. Sore throat after endotracheal intubation. Anaesth Analg 1992;74(6):897-900.