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Original Research Article

A Comparative Study to Evaluate the Incidence of Sore Throat with 2% Lignocaine Jelly and Without Lignocaine Jelly During Endotracheal Intubation

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ABSTRACT

Aim: The aim of the present study was to evaluate the incidence of sore throat with 2% lignocaine jelly and without lignocaine jelly during endotracheal intubation.

Methods: A comparative observational study was conducted and 60 patients were included in the study which was divided into two groups with 30 each.

Results: In the present study, except height of the patients rest of the patients in both the groups showed non-statistical significance. Among the 30 patients in group A, 46.7% of them are <45 years, 53.3% of them are >45 years in age. Among the 30 patients in group B 53% of them are < 45 years, 46.7% of them are >45 years in age. Among the 30 patients in group A, 50.0% of them are females, 50.0% of them are males. Among the 30 patients in group B 36.7% of them are females, 63.3% of them are males. Among the 30 patients in group A, 30.0% of them are in ASA grade 1, 70.0% of them are in ASA grade 2. Among the 30 patients in group B 43.3% of them are in ASA 1, 56.7% of them are in ASA 2. It was observed that there was no significant difference in age, sex, ASA. It was observed that there was significant difference between the groups and POST OP SORE THROAT-1hour, 6 hours, 12 hours and 24 hours. It was observed that there was no significant difference between the groups and cough and hoarseness of voice.

Conclusion: We concluded that when patients are intubated for general anaesthesia with appropriate ETT , incidence of post operative sore throat(POST) is less when 2% lignocaine jelly is used over endotracheal tube when compared to the observations, where lignocaine is not used.

Keywords: Incidence of sore throat, 2% lignocaine jelly, Endotracheal intubation

1. INTRODUCTION

The use of an endotracheal tube (ETT) with a cuff system is the gold standard technique for securing and maintaining a patent airway. Tracheal intubation is a routine step in providing general anesthesia, nonetheless, there are some inherent side effects related to it. The ETT cuff pressure, cuff volume, and duration of intubation are determining factors implicated in the occurrence of local mucosal irritation and inflammation. Tracheal intubation results in post-intubation morbidities like hemodynamic changes, sore throat, hoarseness of voice, coughing,

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blood-streaked expectorations, vocal cord paralysis/dysfunction, tracheal ischemia, etc. Coughing or bucking during emergence from general anesthesia can result in hypertension, tachycardia, increased intraocular and intracranial pressures, myocardial ischemia, bronchospasm, and surgical bleeding. This can be of particular relevance in neurosurgical, ophthalmic, and vascular procedures.[1] Post extubation, sore throat, and hoarseness can be distressing to the patients, affecting their experience of receiving general anesthesia. Various techniques have been explored for reducing post-intubation morbidities like the use of smaller ETT, high-volume low-pressure ETT cuff system, topical application of lubricant jellies, and intravenous lignocaine.[2-5] ETT cuff filled with lignocaine has also been studied as a drug delivery system to reduce post-intubation morbidities.[1,6]

Lignocaine can diffuse across the ETT cuff made of polyvinyl chloride, a largely hydrophobic chemical substance.[7] The cuff can act as a potential reservoir of the local anesthetic, allowing diffusion and subsequent anesthesia of underlying mucosa.[8] An increase in the pH of local anesthetic by alkalinization can predictably increase its non-ionized fraction. The resultant increase in the rate of diffusion of local anesthetic across the ETT cuff allows a reduction of lignocaine dose while achieving an effective seal. Injecting alkalinized lignocaine into the ETT cuff not only reduces post-intubation morbidity but also improves ETT tolerance and helps in producing smooth extubation.

Postextubation coughing during emergence from general anesthesia (GA) and later in the postanesthesia care unit (PACU) is an important problem, with an incidence of 15-94% that can result in potentially dangerous complications such as hypertension, cardiac dysrhythmias, myocardial ischemia, surgical bleeding, bronchospasm, raised intraocular, and intracranial pressure.[9] Many agents have been used as lubricant to reduce the incidence of POST with variable efficacy.[10,11]

The aim of the present study was to evaluate the incidence of sore throat with 2% lignocaine jelly and without lignocaine jelly during endotracheal intubation.

2. MATERIALS AND METHODS

A comparative observational study was conducted and 60 patients were included in the study which was divided into two groups with 30 each.

SUBJECTS:

- Group A – [n=30] Endotracheal tube with 2%lignocaine jelly during intubation.
- Group B - [n=30] Endotracheal tube without 2% lignocaine jelly during intubation.

INCLUSION CRITERIA:

- Elective cases.
- Patients with the age group of 18 to 65
- ASA I and ASA II physical status.

EXCLUSION CRITERIA:

- Patient’s refusal
- Emergency case
- ASA III and above physical status
- Patient with any upper airway surgeries or upper airway problems.
- Nasal intubations.

PROCEDURE

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All the patients were pre medicated with oral alprazolam 0.5mg and tab pantoprazole 40 mg night before surgery.
Patients were shifted to Operation Theatre and all routine monitors (Pulse oximetry, ECG, NIBP, ETCO2) were connected and Iv line was secured.
Patients were randomly assigned to 1 of 2 groups: the lignocaine group and without lignocaine jelly group. Randomization was performed by computer generator random numbers.
In the lignocaine group, the ETTs with tapered-shaped cuff from the distal tip to the distal vocal cords marker were lubricated with lignocaine jelly (Instill gel, 2% jelly).
In another group the ETTs with tapered-shaped cuff from the distal tip to the distal vocal cords marker were not lubricated with lignocaine selected.
60 patients aged 18 to 65 yrs of American society of anaesthesiologists physical status 1 and 2 were included in the study. Anaesthesia induced after adequate pre oxygenation for 3mins with 100% oxygen. Patients were premedicated with 0.2mg glycopyrrolate and 1mg midazolam to decrease secretions and for sedation. Inj Fentanyl 2mcg/kg was given and induced with Inj Propofol 2mg/kg iv and Inj Atracurium 0.5mg/kg was given to facilitate endotracheal intubation. After obtaining ideal intubating conditions, male patients were intubated with 8.0mm or
8.5mm and female patients with 7or 7.5mm internal diameter oral tracheal tubes with a high-volume low presence cuff made of polyvinylchloride. The ETT was inserted so that vocal cords were located between the 2 indicator marks on the distal part of the tube shaft.
Successful intubation was confirmed by end-tidal capnography. The tracheal tube cuff was inflated with air and the cuff pressure was adjusted to 24mm Hg using a calibrated cuff manometer (Portex, Smiths Medical, Germany) The pressure of ETT cuff was maintained 24 mm Hg throughout the surgery.
Anesthesia was maintained with sevoflurane inhalation and intermittent boluses of atracurium. Adequate analgesics were administered. After the surgery, glycopyrrolate 0.01 mg/kg and neostigmine 0.3-0.5mg/kg were given to reverse neuromuscular blockade. Oropharyngeal suction was gently performed under direct vision to avoid trauma to the tissues before extubation.
Extubation of ETT was performed after adequate spontaneous breathing, tidal volume and response to verbal commands were confirmed. After extubation, patients were transferred to the post anaesthesia care unit. Patient was assessed for postoperative sore throat at 6th,12th, 24th hours.

STATISTICAL ANALYSIS:
Data was entered in Microsoft excel. Statistical significance test was done using SPSS software version 20.0. Descriptive analysis was represented in charts and graphs as proportions. Chi-square test was done to compare the difference in proportions of demographic variables like age, gender, ASA status, incidence of sore throat, hoarseness of voice and cough at 1hour, 6hrs, 12hrs and 24hrs. Student T-test was done to compare the mean difference in age, Height, weight, BMI and duration of surgery between the study groups. P- value is considered significant if $P<0.05$.

3. RESULTS

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Table 1: Patient details

Groups			N	Mean	Std. Deviation	P-value
AGE	B	Without Lignocaine	30	39.43	14.409	
	A	Lignocaine jelly	30	44.33	14.230	0.190(NS)
HEIGHT(Cms)	B	Without Lignocaine	30	159.73	7.768	
	A	Lignocaine jelly	30	154.10	12.035	.035(S)
WEIGHT(KG)	B	Without Lignocaine	30	64.90	8.405	
	A	Lignocaine jelly	30	62.30	10.416	0.292(NS)
BMI	B	Without Lignocaine	30	25.53033350	3.518614007	
	A	Lignocaine jelly	30	26.56442587	5.672449079	0.400(NS)
duration of surgery	B	Without Lignocaine	30	2.9350	1.16094	
	A	Lignocaine jelly	30	2.4800	1.25428	0.150(NS)

In the present study, except height of the patients rest of the patients in both the groups showed non-statistical significance.

Table 2: Demographic data

		age		Total	P-value
		<45yrs	>45yrs		
Groups	Lignocaine jelly	14	16	30	0.606(NS)
		46.7%	53.3%	100.0%	
	without lignocaine jelly	16	14	30	
		53.3%	46.7%	100.0%	
Total		30	30	60	
		50.0%	50.0%	100.0%	
		Sex		Total	P-value
		F	M		
Groups	Lignocaine jelly	15	15	30	0.297(NS)
		50.0%	50.0%	100.0%	
	without lignocaine jelly	11	19	30	
		36.7%	63.3%	100.0%	
Total		26	34	60	
		43.3%	56.7%	100.0%	
		ASA			P-value

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		1	2	Total	
Groups	Lignocaine jelly	9	21	30	0.284(NS)
		30.0%	70.0%	100.0%	
	without lignocaine jelly	13	17	30	
		43.3%	56.7%	100.0%	
Total		22	38	60	
		36.7%	63.3%	100.0%	

Among the 30 patients in group A, 46.7% of them are <45 years, 53.3% of them are >45 years in age. Among the 30 patients in group B 53% of them are < 45 years, 46.7% of them are >45 years in age. Among the 30 patients in group A, 50.0% of them are females, 50.0% of them are males. Among the 30 patients in group B 36.7% of them are females, 63.3% of them are males. Among the 30 patients in group A, 30.0% of them are in ASA grade 1, 70.0% of them are in ASA grade 2. Among the 30 patients in group B 43.3% of them are in ASA 1, 56.7% of them are in ASA 2. It was observed that there was no significant difference in age, sex, ASA.

Table 3: 1 hour, 6 hours, 12 hours, 24 hours-Incidence of Sore throat

		1 hour				Total	P-value
		mild	moderate	no sore throat	severe		
group	With lignocaine	12	8	10	0	30	**.020(S)**
		40.0%	26.7%	33.3%	.0%	100.0%	
	without lignocaine jelly	9	14	3	4	30	
		30.0%	46.7%	10.0%	13.3%	100.0%	
Total		21	22	13	4	60	
		35.0%	36.7%	21.7%	6.7%	100.0%	
		6 hours				Total	P-value
		mild	moderate	no sore throat	severe		
group	Lignocaine jelly	8	1	19	2	30	**0.000(S)**
		26.7%	3.3%	63.3%	6.7%	100.0%	
	without lignocaine jelly	14	13	0	3	30	
		46.7%	43.3%	.0%	10.0%	100.0%	
Total		22	14	19	5	60	
		36.7%	23.3%	31.7%	8.3%	100.0%	
		12 hours			Total		P-value
		mild	moderate	no sore throat			
group	Lignocaine jelly	4	0	26	30		**0.000(S)**
		13.3%	.0%	86.7%	100.0%		
	without lignocaine jelly	16	12	2	30		
		53.3%	40.0%	6.7%	100.0%		
Total		20	12	28	60		
		33.3%	20.0%	46.7%	100.0%		
		24 hours			Total		P-value
		mild	moderate	no sore throat	severe		
group	Lignocaine jelly	2	0	28	0	30	**0.000(S)**
		6.7%	.0%	93.3%	.0%	100.0%	

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	without lignocaine jelly	14	4	11	1	30	
		46.7%	13.3%	36.7%	3.3%	100.0%	
Total		16	4	39	1	60	
		26.7%	6.7%	65.0%	1.7%	100.0%	

Among the 30 patients in group A, 40.0% of them have mild, 26.0% of them have moderate, 33.3% of them have no sore throat, 0% of them have severe. Among the 30 patients in group B 30.0% of them have mild, 46.7% of them have moderate, 10.0% of them have no sore throat, 13.3% of them have severe. Among the 30 patients in group A, .26.7% of them have mild, 3.3% of them have moderate,63.3% of them have no sore throat,6.7% of them have severe. Among the 30 patients in group B 46.7% of them have mild, 43.3% of them have moderate, 0% of them have no sore throat, 10.0% of them have severe. 13.3% of them have mild, 0.0% of them have moderate,86.7% of them have no sore throat. Among the 30 patients in group B 53.3% of them have mild, 40.0% of them have moderate, 6.7% of them have no sore throat. Among the 30 patients in group A, .6.7% of them have mild, 0.0% of them have moderate,93.3% of them have no sore throat,0.0% of them have severe. Among the 30 patients in group B 46.7% of them have mild, 13.3% of them have moderate, 36.7% of them have no sore throat,3.3% of them have severe. It was observed that there was significant difference between the groups and POST OP SORE THROAT-1hour, 6 hours, 12 hours and 24 hours.

Table 4: Incidence of cough

		cough		Total	P-value
		no	yes		
group	With lignocaine jelly	24	6	30	0.542(NS)
		80.0%	20.0%	100.0%	
	without lignocaine jelly	22	8	30	
		73.3%	26.7%	100.0%	
Total		46	14	60	
		76.7%	23.3%	100.0%	

Among the 30 patients in group A, 20.0% of them have cough &, 80.0% of them have no cough, Among the 30 patients in group B 26.7% of them have cough, 73.3% of them have no cough. It was observed that there was no significant difference between the groups and cough.

Table 5: Incidence of hoarseness of voice

			hoarseness of voice		Total	P-value
			no	yes		
group	Lignocaine jelly	N%	10	20	30	1.000(NS)
			33.3%	66.7%	100.0%	
	Without Lignocaine jelly	N%	10	20	30	
			33.3%	66.7%	100.0%	
Total		N%	20	40	60	
			33.3%	66.7%	100.0%	

Among the 30 patients in group A, 66.7% of them have hoarseness of voice & 33.3% of them have no hoarseness of voice. Among the 30 patients in group B 66.7% of them have hoarseness

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of voice 33.3% of them have no hoarseness of voice. It was observed that there was no significant difference between the groups and hoarseness of voice.

4. DISCUSSION

Postoperative sore throat (POST) occurs in up to 90% of intubated patients[12-17] and is the most common airway-related complaint of patients after endotracheal intubation.[18] Many contributing factors have been studied, including the material and design of the endotracheal tube (ETT), lubricants on the tube, the equipment utilized for intubation and airway management, the relaxant or anesthetics administered, hypotension, trauma at laryngoscopy or intubation, and the experience of the practitioner.[12-15] Intracuff pressure on ETT is also an important cause of POST and hoarseness of voice.[18] In addition, either the tracheal tube itself or the laryngoscopy per se can cause laryngeal trauma and sore throat.[15]
In the present study, except height of the patients rest of the patients in both the groups showed non-statistical significance. Among the 30 patients in group A, 46.7% of them are <45 years, 53.3% of them are >45 years in age. Among the 30 patients in group B 53% of them are < 45 years, 46.7% of them are >45 years in age. Among the 30 patients in group A, 50.0% of them are females, 50.0% of them are males. Among the 30 patients in group B 36.7% of them are females, 63.3% of them are males. Among the 30 patients in group A, 30.0% of them are in ASA grade 1, 70.0% of them are in ASA grade 2. Among the 30 patients in group B 43.3% of them are in ASA 1, 56.7% of them are in ASA 2. It was observed that there was no significant difference in age, sex, ASA. Selvaraj and Dhanpal[19] compared steroid gel with lidocaine jelly and a control group with nothing applied to the tube and found the incidence of sore throat to be 33.3% in the steroid gel group versus 73.3% in the other two groups. They reported that the incidence of cough and hoarseness was 23.3% in the steroid gel group, 63.3% in the lidocaine gel group and 50% in the control group. Their study also suggested that lidocaine jelly increased the incidence of these symptoms when compared with the control group and demonstrated that steroid gel reduced the incidence of the symptoms significantly when compared with lidocaine gel. A similar finding was reported by Kori and colleagues[20] who studied the influence of endotracheal tube cuff lubrication with lidocaine jelly on postoperative sore throat and hoarseness.

It was observed that there was significant difference between the groups and POST OP SORE THROAT-1hour, 6 hours, 12 hours and 24 hours. It was observed that there was no significant difference between the groups and cough and hoarseness of voice. Brimacombe et al[21] explained that pressure exerted by the tracheal tube cuff on the mucosa may exceed capillary perfusion pressures and is a major cause of morbidity in intubated patients. Jensen et al[22] found that frequency and severity of POST after short-term intubation was significantly greater after the use of low-pressure, high-volume cuffs, than after the use of a mask or of high-pressure, low-volume cuffs.[23] The incidence of sore throat varies with the use of different lubricants, degree of intra-cuff pressures, and number of attempts of airway device insertion. Two percent lignocaine jelly has also been implicated as a cause of transient bilateral recurrent laryngeal nerve palsy.[24] In a study comparing saline and lignocaine gel for occurrence of POST with classic laryngeal mask airway, the incidence of sore throat was found to be similar with both and author suggested that there is no role of lignocaine gel in prevention of POST.[25] However, Tanaka et al[26] in a data-based systematic review concluded that topical and systemic lignocaine is useful for prevention of POST.

5. CONCLUSION

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We concluded that when a patient is intubated with appropriate sized ETT, incidence of post operative sore throat is less when 2% lignocaine jelly is used over ET tube during intubation compared to the observations, where lignocaine is not used.

6. REFERENCES

1. Fagan C, Frizelle HP, Laffey J, Hannon V, Carey M. The effects of intracuff lidocaine on endotracheal-tube-induced emergence phenomena after general anesthesia. Anesth Analg. 2000 Jul;91(1):201-5.
2. Stout DM, Bishop MJ, Dwersteg JF, Cullen BF. Correlation of endotracheal tube size with sore throat and hoarseness following general anesthesia. Anesthesiology. 1987 Sep;67(3):419-21.
3. Jensen PJ, Hommelgaard P, Søndergaard P, Eriksen S. Sore throat after operation: influence of tracheal intubation, intracuff pressure and type of cuff. Br J Anaesth. 1982 Apr;54(4):453-7.
4. Winkel E, Knudsen J. Effect on the incidence of postoperative sore throat of 1 percent cinchocaine jelly for endotracheal intubation. Anesth Analg. 1971 Jan-Feb;50(1):92-4.
5. STEINHAUS JE, GASKIN L. A study of intravenous lidocaine as a suppressant of cough reflex. Anesthesiology. 1963 May-Jun;24:285-90.
6. Rao M, Snigdha AT, Vijay K. Instillation of 4% lidocaine versus air in the endotracheal tube (ETT) cuff to evaluate post intubation morbidity-a randomized double blind study. J Anesth Clin Sci. 2013;2(2):19.
7. Huang CJ, Tsai MC, Chen CT, Cheng CR, Wu KH, Wei TT. In vitro diffusion of lidocaine across endotracheal tube cuffs. Can J Anaesth. 1999 Jan;46(1):82-6.
8. Estebe JP, Gentili M, Le Corre P, Dollo G, Chevanne F, Ecoffey C. Alkalinization of intracuff lidocaine: efficacy and safety. Anesth Analg. 2005 Nov;101(5):1536-1541.
9. Soltani HA, Aghadavoudi O. The effect of different lidocaine application methods on postoperative cough and sore throat. J Clin Anesth. 2002 Feb;14(1):15-8.
10. Christensen AM, Willemoes-Larsen H, Lundby L, Jakobsen KB. Postoperative throat complaints after tracheal intubation. Br J Anaesth. 1994 Dec;73(6):786-7.
11. McHardy FE, Chung F. Postoperative sore throat: cause, prevention and treatment. Anaesthesia. 1999 May;54(5):444-53.
12. Loeser EA, Kaminsky A, Diaz A, Stanley TH, Pace NL. The influence of endotracheal tube cuff design and cuff lubrication on postoperative sore throat. Anesthesiology. 1983 Apr;58(4):376-9.
13. Loeser EA, Orr DL 2nd, Bennett GM, Stanley TH. Endotracheal tube cuff design and postoperative sore throat. Anesthesiology. 1976 Dec;45(6):684-7.
14. Loeser EA, Stanley TH, Jordan W, Machin R. Postoperative sore throat: influence of tracheal tube lubrication versus cuff design. Can Anaesth Soc J. 1980 Mar;27(2):156-8.
15. Stock MC, Downs JB. Lubrication of tracheal tubes to prevent sore throat from intubation. Anesthesiology. 1982 Nov;57(5):418-20.
16. HARTSELL CJ, STEPHEN CR. INCIDENCE OF SORE THROAT FOLLOWING ENDOTRACHEAL INTUBATION. Can Anaesth Soc J. 1964 May;11:307-12.
17. Stehling LCBarash PG, Cullen BF, Stoelting RK. Management of the airway 1992 Clinical Anesthesia. Philadelphia JB Lippincott:685–708.
18. Suzuki N, Kooguchi K, Mizobe T, Hirose M, Takano Y, Tanaka Y. [Postoperative hoarseness and sore throat after tracheal intubation: effect of a low intracuff pressure

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of endotracheal tube and the usefulness of cuff pressure indicator]. Masui. 1999 Oct;48(10):1091-5.

19. Selvaraj T, Dhanpal R. Evaluation of the application of topical steroids on the endotracheal tube in decreasing post-operative sore throat. Journal of Anaesthesiology: Clinical Pharmacology. 2002;18(2):167-70.
20. Kori K, Muratani T, Tatsumi S, Minami T. [Influence of endotracheal tube cuff lubrication on postoperative sore throat and hoarseness]. Masui. 2009 Mar;58(3):342-5.
21. Brimacombe J, Keller C, Giampalmo M, Sparr HJ, Berry A. Direct measurement of mucosal pressures exerted by cuff and non-cuff portions of tracheal tubes with different cuff volumes and head and neck positions. Br J Anaesth. 1999 May;82(5):708-11.
22. Jensen PJ, Hommelgaard P, Søndergaard P, Eriksen S. Sore throat after operation: influence of tracheal intubation, intracuff pressure and type of cuff. Br J Anaesth. 1982 Apr;54(4):453-7.
23. Figueredo E, Martínez M, Pintanel T. A comparison of the ProSeal laryngeal mask and the laryngeal tube in spontaneously breathing anesthetized patients. Anesth Analg. 2003 Feb;96(2):600-5, table of contents.
24. Inomata S, Nishikawa T, Suga A, Yamashita S. Transient bilateral vocal cord paralysis after insertion of a laryngeal mask airway. Anesthesiology. 1995 Mar;82(3):787-8.
25. Keller C, Sparr HJ, Brimacombe JR. Laryngeal mask lubrication. A comparative study of saline versus 2% lignocaine gel with cuff pressure control. Anaesthesia. 1997 Jun;52(6):592-7.
26. Tanaka Y, Nakayama T, Nishimori M, Sato Y, Furuya H. Lidocaine for preventing postoperative sore throat. Cochrane Database Syst Rev. 2009 Jul 8;(3):CD004081.