

# Incidence of Post-Op Sore Throat in Tertiary Care Hospital of Khyber Pukhtankhwa

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## ABSTRACT

**Objective:** To find out the incidence and frequency of post-Op sore throat in a tertiary care hospital.

**Study Design:** Observational (cross sectional) Study.

**Setting:** Department of Anesthesia Hayatabad Medical Complex Peshawar Khyber Pakhtunkhwa Pakistan.

**Duration of Study:** This study was conducted from 1<sup>st</sup> November 2022 to 30<sup>th</sup> April 2023.

**Subjects and Methods:** A total of 100 patients of both genders who underwent various types of surgical procedures under general anesthesia were admitted and followed in the post-operative period. After informed consent, patient selection was done through non probability consecutive sampling keeping inclusion and exclusion criteria in perspective and proformas were filled. Data was analyzed using Statistical software SPSS version 23.0 and results shown in the form of descriptive tables.

**Results:** The total number of patients enrolled in the study were 104 out of which 44 were male and 60 were female with mean age of  $41.1 \pm 10.7$ . There was no significant association observed between sore throat and gender (p-value 0.630), age (p-value 0.367) size of ETT used (p-value 0.862) and duration of anesthesia (p-value 0.265).

**Conclusion:** Post-operative sore throat is a regular occurring complication in patients however its incidence can be reduced by identifying the proper risk factors.

**Keywords:** Anesthesia, intubation, Sore throat.

## INTRODUCTION

Sore throat following endotracheal intubation is one of the regularly observed adverse events and it is also one of the most intolerable complaints by patients in the post-operative period [1]. The percentage incidence of postoperative sore throat (POST) ranges from 20% to 74% [2,3], this variation being heavily dependent on many factors including type of equipment used, operator experience and duration of surgery. Some papers have reported the proportion of cases to fall between 6.6% to 90% [4,5,6]. The average incidence with using a laryngeal mask airway has been calculated to be 17.5% and only 3.3% while using a facemask for maintenance anesthesia [7,8,9].

This high occurrence of POST can greatly affect the quality of life in patients. Some risk factors for this condition that have been frequently documented include gender (females mostly) [13], juvenile age, lung related co-morbidities, time of intubation. In addition to this, multiple inquiries have also proven neuromuscular blocking agents, larger sized endotracheal tubes with high cuff pressure [12][16], smoking [14] strenuous intubation and the use of suxamethonium [15], post-operative tracheal suctioning [17] and iatrogenic injury during laryngoscopy [18] to be responsible for this problem.

The pathophysiology of this condition is still under study and theories have suggested the release of inflammatory mediators and cytokines following local response to frictional injury to the laryngeal and tracheal mucosa. Even though a proper anatomical location has not been localized yet, it is hypothesized that these mediators deploy their effect on the sensory supply of the laryngeal airway following intubation [19,20]. POST after intubation increases patient morbidity and dissatisfaction therefore it needs to be addressed how it can be controlled by identifying the main risk factors through further clinical trials.

In our population of developing countries, all the patients undergoing different elective surgeries through General Anesthesia involving tracheal intubation experience problem of sore throat, Post –Op under observation for 24 hours. Different variables have been observed to have a role in the POST, like the ETT size, number of attempts of intubation, extubating with suctioning and demographic variables like age and gender. By finding the incidence and frequency of the above-mentioned variables, this

study will help in providing the evidence needed to know about the role of different variables. This will further aid and encourage the Anesthesiologists to take care of all the variables and factors whenever they give General Anesthesia involving tracheal intubation procedure, that will minimize the complication of POST with better outcome of the patients and less stay at hospital.

**Objective:** To find out the incidence and frequency of post-Op sore throat in tertiary care hospital.

## MATERIALS AND METHODS

**Study Setting:** All functional operation theatres of Hayatabad Medical Complex undergoing different elective surgeries, under Anesthesia department.

**Study Duration:** From 1<sup>st</sup> November 2022 to 30<sup>th</sup> April 2023.

**Sample Size:** Total 100 patients

**Study Design:** Cross sectional type of observational study.

**Sampling Technique:** Non-probability consecutive sampling.

**Sample Selection:**

**Inclusion Criteria:**

1 All patients undergoing elective surgery through General Anesthesia, between the ages of 20 to 60 years.

2 Either gender.

**Exclusion Criteria:**

1 Age groups below 20 years old and above 60 years old patients.

2 Having current symptoms of sore throat.

3 Elective surgeries not done through General Anesthesia.

4 Elective surgeries done through General Anesthesia, that do not involve tracheal intubation.

**Data Collection Procedure:** The hospital's ethics and scientific committee gave its clearance before the study could be carried out. The study covered all patients who met the inclusion requirements. All patients were informed of the study's goals and benefits, and they were reassured that their participation was voluntary and that the information would only be used for research purposes. If consent was given, a formal informed consent was obtained. All patients underwent thorough clinical and historical evaluations, followed by standard pre-operative anesthesia baseline reviews and investigations such as regular blood counts, LFTs, RFTs, PT/APTT, blood grouping, cross matching, ECG,

Chest X-RAY and serum electrolytes. All patients were induced and maintained with standard anesthetic technique. Post-operatively, all the patients were interviewed and kept under observation for 24 hours and after informed consent, a standard proforma, including patient's name, age, gender and different variables to be assessed for the study to be done, were filled. Strictly exclusion criteria were followed to control confounders and bias in the study results.

**Data Analysis:** Data was analyzed by using statistical software SPSS version 23.0. Mean ± Standard deviation was calculated for quantitative variables like age and duration of anesthesia. Qualitative variables like gender, size of ET tube used and presence/absence of sore throat was calculated in the form of frequencies and percentages. Chi square test was applied to find the association of post-operative sore throat with other variables taking p value of <0.05 as statistically significant. All the results were presented in the form of graphs and tables.

**RESULTS**

The total number of patients enrolled in the study were 104 out of which 44 were male and 60 were female with mean age of 41.1 ± 10.7. All patients were intubated as part of general anesthesia using endotracheal tubes (ETT) of various sizes for all surgical procedures: mostly ETT tubes of size 7 (53.8%) and 7.5 (44.2%) were used and one patient each were intubated with size 5 and 6.5 as well. Patients were categorized in terms of duration of anesthesia given: 45 (43.3%) were intubated for one hour, 49 patients (47.1%) for 2 hours, 7 patients (6.7%) for 3 hours, 2 patients (1.9%) for 4 hours and 1 patient (1%) for more than 4 hours. Post operative sore throat was seen in 22 patients (21.2%) and absent in 82 patients (78.8%). Chi square test was applied to test the association of sore throat (dependent variable) with gender, duration of anesthesia and size of ETT tube used (independent variables) using p-value <0.05 as statistically significant. There was no significant association observed between sore throat and gender (p-value 0.350), age (p-value 0.367) size of ETT used (p-value 0.862) and duration of anesthesia (p-value 0.265).

Table 1: Gender descriptive statistics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	44	42.3	42.3	42.3
	Female	60	57.7	57.7	100.0
	Total	104	100.0	100.0	

Table 2: Sore throat descriptive statistics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Present	22	21.2	21.2	21.2
	Absent	82	78.8	78.8	100.0
	Total	104	100.0	100.0	

Table 3: ETT size descriptive statistics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	7	56	53.8	53.8	53.8
	7.5	46	44.2	44.2	98.1
	6.5	1	1.0	1.0	99.0
	5	1	1.0	1.0	100.0
	Total	104	100.0	100.0	

Table 4: Duration of Anesthesia descriptive statistics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-60	45	43.3	43.3	43.3
	61-120	49	47.1	47.1	90.4
	121-180	7	6.7	6.7	97.1
	180-240	2	1.9	1.9	99.0
	>240	1	1.0	1.0	100.0
	Total	104	100.0	100.0	

Table 5: Correlation of gender with sore throat

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.404 <sup>a</sup>	1	.525		
Continuity Correction <sup>b</sup>	.154	1	.695		
Likelihood Ratio	.408	1	.523		
Fisher's Exact Test				.630	.350
Linear-by-Linear Association	.400	1	.527		
N of Valid Cases	104				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.31.

b. Computed only for a 2x2 table

Table 6: Correlation of age with sore throat

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	37.235 <sup>a</sup>	35	.367
Likelihood Ratio	42.291	35	.185
Linear-by-Linear Association	.004	1	.951
N of Valid Cases	104		

a. 69 cells (95.8%) have expected count less than 5. The minimum expected count is .21.

Table 7: Correlation of size of ETT with sore throat

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.749 <sup>a</sup>	3	.862
Likelihood Ratio	1.161	3	.762
Linear-by-Linear Association	.559	1	.455
N of Valid Cases	104		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is .21.

Table 8: Correlation of sore throat with duration of anesthesia

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.220 <sup>a</sup>	4	.265
Likelihood Ratio	4.403	4	.354
Linear-by-Linear Association	2.064	1	.151
N of Valid Cases	104		

a. 5 cells (50.0%) have expected count less than 5. The minimum expected count is .21.

**DISCUSSION**

Sore throat is a familiar complaint in surgical patients who undergo tracheal intubation as part of general anesthesia. The present study illustrates that only 21.2% of the patients developed sore throat in the post operative period. Literature has shown the reported incidence of post-operative sore throat (POST) which varies from 12% to 65% [10] [11]. Additional statistical analysis has depicted its incidence to range from 14.4% to 50% [21-28]. So, there is quite a lot of variation as far as percentage incidence is concerned appertaining to differences in hospital setups, experience of anesthesiologists and patient selection. POST is thought to result from frictional injury to the tracheal and laryngeal mucosa especially from using larger cuffs with high volume pressures [29], another theory suggests the possibility of nerve injury with prolonged intubation to cause this problem.

Subject specialists have highlighted several risk factors to be causative agents behind POST. A study by Lee JY and his colleagues showed that using endotracheal tubes with a higher intracuff pressure (>17 mmH<sub>2</sub>O) and a prominent cough reflex on extubating resulted in higher incidence of POST in Korean patients [30]. A Hospital based cross sectional study by Efreem Fenta and his co-authors declared female gender, larger sized endotracheal tubes and multiple attempts at intubation as elements to cause POST [31]. Furthermore, POST has been found to have an association with duration of intubation and type of surgery as mentioned in a systemic review by Obsa MS et.al [32]. Even the

use of nasogastric tube has been associated with this complication [33]. Surprisingly though, the following study did not show any significant association of post operative sore throat with the study variables as Pearson chi square gave us p-values greater than 0.05. This could be attributed to the fact that there might be some other variables that may cause this adverse effect in the post operative period.

This study was not without some limitations. It was a simple cross-sectional study, more extensive designs such as cohort and RCT type of studies could have given us more convincing results. Since it was initially intended to be a pilot study therefore the sample size selected was small. Some variables such as ASA status, experience of the anesthetist, type of muscle relaxant used and intra cuff pressure were not addressed in the study.

**CONCLUSION**

Even though the incidence of post-operative sore throat was low in our study, still it is regarded as one of the most undesirable outcomes and commonest patient complaints in the post operative period. Proper awareness needs to be spread among the health care professionals and post operative sore throat management protocols need to be formulated to decrease the percentage of cases even further. The main risk factors for POST need to be identified and suitable steps need to be taken to control them in the future.

**REFERENCES**

1 M. Jaensson, L.L. Olowsson, U. Nilsson Endotracheal tube size and sore throat following surgery: a randomized-controlled study *Acta Anaesthesiol Scand*, 54 (2) (2010), pp. 147-153

2 M. Lehmann, K. Monte, P. Barach, C.H. Kindler Postoperative patient complaints: a prospective interview study of 12,276 patients *J Clin Anesth*, 22 (1) (2010), pp. 13-21

3 M.P. Arts, T.C. Rettig, J. de Vries, J.F. Wolfs Maintaining endotracheal tube cuff pressure at 20 mm Hg to prevent dysphagia after anterior cervical spine surgery; protocol of a double-blind randomised controlled trial *BMC Musculoskel Disord*, 14 (1) (2013), pp. 1-4

4 .A. Christensen, H. Willemoes-Larsen, L. Lundby, K. Jakobsen Postoperative throat complaints after tracheal intubation *Br J Anaesth*, 73 (6) (1994), pp. 786-787

5 M. Shah, W. Mapleson Sore throat after intubation of the trachea *Br J Addiction*: *Br J Anaesth*, 56 (12) (1984), pp. 1337-1342

6 R. Lev, P. Rosen Prophylactic lidocaine use preintubation: a review *J Emerg Med*, 12 (4) (1994), pp. 499-506

7 F. McHardy, F. Chung, Top 10 most read original Anaesthesia paper 2013 *Anaesthesia*, 54 (5) (1999), pp. 444-453

8 G.P. Joshi, Y. Inagaki, P.F. White, L. Taylor-Kennedy, L.I. Wat, C. Gevirtz, et al. Use of the laryngeal mask airway as an alternative to the tracheal tube during ambulatory anesthesia *Anesth Analg*, 85 (3) (1997), pp. 573-577

9 P. Higgins, F. Chung, G. Mezei Postoperative sore throat after ambulatory surgery *Br J Anaesth*, 88 (4) (2002), pp. 582-584

10 P. Biro, B. Seifert, T. Pasch, Complaints of sore throat after tracheal intubation: a prospective evaluation *Eur J Anaesth| EJA*, 22 (4) (2005), pp. 307-311

11 K. Maruyama, H. Sakai, H. Miyazawa, N. Toda, Y. Iinuma, N. Mo chizuki, et al Sore throat and hoarseness after total intravenous anaesthesia *Br J Anaesth*, 92 (4) (2004), pp. 541-543

12 K. El-Boghdady, C. Bailey, M. Wiles Postoperative sore throat: a systematic review *Anaesthesia*, 71 (6) (2016), pp. 706-717

13 D. Gupta, S. Agrawal, J.P. Sharma Evaluation of preoperative Strepsils lozenges on incidence of postextubation cough and sore throat in smokers undergoing anesthesia with endotracheal intubation *Saudi J Anaesth*, 8 (2014), pp. 244-248

14 R. Alcock, T. Peachey, M. Lynch, T. Mcewan Comparison OF alfentanil with suxamethonium IN facilitating nasotracheal intubation IN day-case anaesthesia [Internet] *Br J Anaesth*, 70 (1) (1993), pp. 34-37, 10.1093/bja/70.1.34

15 H. Bum, J. Dae, H. Kim, Y. Jeong The effect of cuff pressure on postoperative sore throat after Cobra perilaryngeal airway *J Anesth*, 26 (2012), pp. 225-229

16 T. Mencke, G. Noeldge-Schomburg Laryngeal morbidity after use of the laryngeal mask airway *Acta Anaesthesiol Scand*, 54 (2010), pp. 127-128 and G. NOELDGE-SCHOMBURG

17 Y.J. Xu, S.L. Wang, Y. Ren, Y. Zhu, Z.M. Tan A smaller endotracheal tube combined with intravenous lidocaine decreases post-operative sore throat *Acta Anaesthesiol Scand*, 56 (2012), pp. 1314-1320 2012

18 O. Canbay, N. Celebi, A. Sahin, V. Celiker, S. Ozgen, U. Aypar Ketamine gargle for attenuating postoperative sore throat *Br J Anaesth*, 100 (4) (2008), pp. 490-493

19 M. Jaensson, A. Gupta, U. Nilsson Gender differences in sore throat and hoarseness following endotracheal tube or laryngeal mask airway: a prospective study *BMC Anesthesiol*, 14 (56) (2014), pp. 1-8

20 M. Jaensson, A. Gupta, U.G. Nilsson Gender differences in risk factors for airway symptoms following tracheal intubation *Acta Anaesthesiol Scand*, 1-8 (2012)

21 Christensen AM, Willemoes-Larsen H, Lundby L, Jakobsen KB. Postoperative throat complaints after tracheal intubation. *British Journal of Anaesthesia* 1994; 73: 786-7.

22 Harding CJ & McVey FK. Interview method affects incidence of postoperative sore throat. *Anaesthesia* 1987; 42: 1104-7.

23 Herlevsen P, Bredahl C, Hindsholm K, Kruhoff PK. Prophylactic laryngo-tracheal aerosolized lidocaine against postoperative sore throat. *Acta Anaesthesiologica Scandinavica* 1992; 36: 505-7.

24 Jorgensen LN, Weber M, Pedersen A, Munster M. No increased incidence of postoperative sore throat after administration of suxamethonium in endotracheal anaesthesia. *Acta Anaesthesiologica Scandinavica* 1987; 31: 768-70.

25 Joshi GP, Inagaki Y, White PF, et al Use of the laryngeal mask airway as an alternative to the tracheal tube during ambulatory anaesthesia. *Anesthesia and Analgesia* 1997; 85: 573-7.

26 Stout DM, Bishop MJ, Dwersteg JF, Cullen BF. Correlation of endotracheal tube size with sore throat and hoarseness following general anaesthesia. *Anesthesiology* 1987; 67: 419-21.

27 Stride PC. Postoperative sore throat: topical hydrocortisone. *Anaesthesia* 1990; 45: 968-71.

28 Winkel E & Knudsen J. Effects on the incidence of postoperative sore throat of 1 percent cinchocaine jelly for endotracheal intubation. *Anesthesia and Analgesia* 1971; 50: 92-4.

29 Nordin U, Lindholm CE, Wolgast M. Blood flow in the rabbit tracheal mucosa under normal conditions and under the influence of tracheal intubation. *Acta Anaesthesiologica Scandinavica* 1977; 21: 81-94.

30 Lee JY, Sim WS, Kim ES, Lee SM, Kim DK, Na YR, Park D, Park HJ. Incidence and risk factors of postoperative sore throat after endotracheal intubation in Korean patients. *J Int Med Res*. 2017 Apr;45(2):744-752. doi: 10.1177/0300060516687227. Epub 2017 Feb 7. PMID: 28173712; PMCID: PMC5536682.

31 Fenta E, Teshome D, Melaku D, Tesfaw A. Incidence and factors associated with postoperative sore throat for patients undergoing surgery under general anesthesia with endotracheal intubation at Debre Tabor General Hospital, North central Ethiopia: A cross-sectional study. *International Journal of Surgery Open*. 2020;25:1-5.

32 Obsa MS, Adem AO, Bancha B, Gelgelu TB, Gemechu AD, Tilla M, et al. Global incidence and risk factors of post-operative sore throat among patients who underwent surgery: A systematic review and meta-analysis. *International Journal of Surgery Open*. 2022;47:100536.

33 Obsa MS, Adem AO, Bancha B, Gelgelu TB, Gemechu AD, Tilla M, et al. Global incidence and risk factors of post-operative sore throat among patients who underwent surgery: A systematic review and meta-analysis. *International Journal of Surgery Open*. 2022;47:100536.