

# Incidence and Associated Risk Factors of Postoperative Sore Throat in Tertiary Care Hospital

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## ABSTRACT

### Background

Postoperative sore throat is a relatively minor complaint but a frequent postoperative complication of anesthesia. The incidence of postoperative sore throat varies from 0-50% in most research studies, but some report the incidence is as high as 51-100% following general anesthesia.

### Objective

The aim of this study was to obtain the incidence and determine the associated risk factors of postoperative sore throat in tertiary care hospital.

### Method

Three hundred and seventy six patients who underwent various surgeries under general anesthesia in Dhulikhel Hospital during a four month period were included. Using a predesigned questionnaire with follow up after 24-30 hours after extubation, data was collected. Sore throat was identified using a four point scale (0-3).

### Result

Overall incidence of postoperative sore throat was 50.8%. Patient with airway device endotracheal tubes had the highest incidence (52.2%, 176 of 337), and patient with i-gel had a lower incidence of sore throat (33.3%, 7 of 21). Female patients reported more sore throat than male, more common with older age group and duration of anesthesia more than two hours. Increased incidence of postoperative sore throat was not associated with the type of surgery, number of intubation attempts, category of personnel performing airway management and use of oropharyngeal airway.

### Conclusion

Postoperative sore throat is a common complication of airway instrumentation in general anesthesia that can lead to discomfort. The overall incidence of postoperative sore throat in this study was 50.8%. Endotracheal tube, female patients and increased duration of anesthesia were associated with increased postoperative sore throat rates.

## KEY WORDS

*Airway device, anesthesia, complication, postoperative, sore throat*

## INTRODUCTION

In its simplest form, sore throat is a lay description of pharyngitis, which in itself can have a variety of causes. Postoperatively, it is a result of mucosal injury caused by airway instrumentation or the irritating effects of a foreign object i.e., airway tubes.<sup>1</sup> It is a common complication of anesthesia and can lead to dissatisfaction after surgery. Postoperative sore throat (POST) is generally considered a minor consequence, is most often relieved within 24 hours and is rated as eighth most undesirable outcome in postoperative period.<sup>2-4</sup>

The prevalence of POST varies from 18 to 65% following general anesthesia.<sup>5</sup> It is reported with a high frequency and can sometimes persist for several days.<sup>6</sup> However, it is often neglected by medical staff and not routinely investigated, but it can be quite distressing to the patient.<sup>7,8</sup> Many factors can contribute to POST and the incidence varies with the method of airway management.<sup>9</sup> It is highest after endotracheal tube (ETT) intubation and varies from 14.4 to 50%,<sup>10-13</sup> while after laryngeal mask airway (LMA) insertion the incidence can vary from 5.8 to 34% and much less in face mask.<sup>10,14,15</sup>

Many studies were done to determine the incidence of POST and to find measures for its prevention.<sup>4,9,10,16</sup> but in Nepal, there is no published data, so we conducted this study to determine the incidence and to explore associated risk factors contributing of POST at our hospital. Such study could help reduce occurrence of POST by promoting effective strategies for prevention.

## METHODS

This prospective cross sectional study was undertaken at Dhulikhel Hospital, Kathmandu University Hospital from September-December 2015. A total of 376 consecutive elective and emergency surgical patients were studied with aged 12 years and older who had undergone obstetric, gynecological, orthopedic, urology, ear surgery and general surgery. Patients who had surgery in the mouth or throat area, nasal intubation, pre-existing upper airway infection and those requiring orogastric or nasogastric tubes were excluded from the study.

The questionnaire, which was the instrument of the study, was pretested on the surgical patients. Patients' age, sex, name of the surgical procedure and information about anesthesia management was recorded on this standardized information sheet. The airway devices were lubricated with lignocaine jelly before insertion. The technique of anesthesia varied from spontaneous to continuous ventilation. After surgery the patients were shifted to post anesthesia care unit (PACU). The PACU nurses obtained patient information from the patient's record regarding the type of surgery (elective vs. emergency), duration of anesthesia, use airway device, access and number of

attempts for intubation, muscle relaxants used, category of anesthesia provider and use of oropharyngeal device. The patients were interviewed at after one hour of extubation (before leaving the PACU) by a PACU nurse using a four point scale (0-3): 0, no sore throat; 1, mild sore throat (complains of sore throat only on asking); 2, moderate sore throat (complains of sore throat on his/her own); 3, severe sore throat (change of voice or hoarseness, associated with throat pain).<sup>17</sup>

Approval from Institutional Review Committee (IRC), Kathmandu University School of Medical Sciences (KUSMS) was obtained to conduct the study. All the study participants were informed about the purpose of the study; verbal consent was obtained from each patient before the interview.

Data was sorted, coded, and entered into microsoft access and then to Statistical Package for the Social Sciences (SPSS) software version 18 for management and analysis. Descriptive statistics including frequency, mean, range, and standard deviation were used to summarize patients' baseline sociodemographic data. Chi squared test was used for non parametric categorical data and t- test for parametric data. P value less than 0.05 was considered significant.

## RESULTS

Data was collected between September and December 2015. During the study period 376 patients who met the inclusion criteria, undergone the surgical procedures under general anesthesia were enrolled in the study. The mean age of the patients was 37.1 years.

Among 376 patients 191(50.8%) reported sore throat. There were 221(58.8%) female patients and 155(41.2%) male patients. Sore throat was slightly higher in females than male patient (53% vs. 47.7%) but it was not statistically significant. Patient with ETT had the highest incidence (52.2%, 176 of 337), and patient with i-gel had a lower incidence of sore throat (33.3%, 7 of 21), however it was not statistically significant (Table 1).

**Table 1. Relationship of airway management and occurrence of post-operative sore throat (N=376)**

Type of airway devices used	POST No	POST Yes	Total	%	p value
Endotracheal Tube (ETT)	161	176	337	52.2	
Laryngeal Mask Airway (LMA)	10	8	18	44.4	
I-gel	14	7	21	33.3	
Total	185	191	376	-	p=0.20

In an older age group (above 60 years of age), sore throat was higher (65.6%) compared to the age group of 51-60 years of age (41.0%) however it was not statistically significant (Table 2).

**Table 2.** Relationship of Age with occurrence of post-operative sore throat (N=376)

Age (years)	No	Yes	Total	%	p value
12 - 20	20	21	41	51.2	
21 - 30	50	59	109	54.1	
31 - 40	48	48	96	50.0	
41 - 50	33	26	59	44.0	
51 - 60	23	16	39	41.0	
> 60	11	21	32	65.6	
Total	185	191	376	-	p = 0.31

There was no significant difference between those patients who had elective surgery and emergency surgery or those patients whose intubation attempts was one or two or three or more (Table 3). Similarly there were no differences between those patients with the category of personnel performing airway management (anesthesiologist or medical officer/residents or others e.g. nurses/medical students) or whose airway access was easy or difficult, and between those patients with the use of oropharyngeal airway and incidence of POST (Table 3).

**Table 3.** Incidence of sore throat in relation different variables (N=376)

Variables	No. (%)	Total No.	p value
<b>Type of surgery</b>			
• Elective	159 (50.9)	312	
• Emergency	32 (50.0)	64	0.88
<b>Number of attempts for intubation</b>			
• One	168 (51.3)	327	
• Two	19 (46.3)	41	
• Three or more	4 (50.0)	8	0.66
<b>Category of personnel performing airway management</b>			
• Anesthesiologist	47 (47.0)	100	
• Medical officer/ Residents	99 (50.0)	198	
• Others (Nurses/medical students)	45 (57.6)	78	0.66
<b>Access to airway</b>			
• Easy	177 (51.4)	344	
• Difficult	14 (43.7)	32	0.40
<b>Use of oropharyngeal airway</b>			
• Yes	51 (48.1)	106	
• No	140 (51.8)	270	0.47

There was no difference in the incidence after use of vecuronium or suxamethonium or no use of muscle relaxants. One hundred and twelve (53%) patients with duration of anesthesia two hours or more complained of sore throat whereas ten (31.2%) patients with duration of anesthesia less than one hour developed a sore throat postoperatively (Table 4).

**Table 4.** Duration of anesthesia and occurrence of post-operative sore throat (N=376)

Duration of anesthesia	No. (%)	Total	p value
Less than 1 hour	10 (31.2)	32	
1-2 hours	69 (51.8)	133	p = 0.08
More than 2 hours	112 (53.0)	211	

## DISCUSSION

Postoperative sore throat is a well-recognized complication after general anaesthesia.<sup>14,16</sup> POST following the use of endotracheal intubation and laryngeal mask airway is a common minor complication.<sup>10,14,16</sup> The overall incidence of postoperative sore throat in this study was 50.8% which is lower than that reported in other studies.<sup>8,18</sup> However the incidence was higher than that reported in many other previous studies.<sup>3,4,6,11,12,13,19</sup>

The incidence of sore throat was higher in females in accordance with many previous studies.<sup>3,4,9,11,14,16</sup> The present study also shows higher incidence of POST in female patients. However, in the studies carried out by Edomwonyi et al. and Kloub found no significant difference in the incidence of sore throat between sexes.<sup>8,18</sup>

The choice in airway management was the most significant factor in the development of POST.<sup>16</sup> As in this study, other studies have also revealed that the incidence is the highest after tracheal intubation and varies from 14.4 to 50%.<sup>2,9,10,11,16,20</sup> Another study demonstrated that second-generation supraglottic airway devices have reduction in postoperative sore throat when using the i-gel, possibly due to the absence of an inflatable cuff.<sup>7</sup> It was also evidenced in this present study. It is reported that the LMA produces less sympathetic stimulation than the tracheal intubation on insertion and after intubation an overinflated ETT cuff have been proposed to be a possible cause of POST.<sup>21</sup>

The increased rate of POST found in this study with increased age more than 60 years is consistent with the findings from other study.<sup>9</sup> In contrast, in the study carried out by Higgins et al, the incidence of POST was highest in the younger age group and a few studies found that there was no significant difference between age group and incidence of POST.<sup>2,16,18</sup>

This study further confirms reports from other studies, which found no significant difference in the incidence of POST and type of surgery.<sup>10,18</sup> Many authors reported that multiple attempts at intubation do not affect the incidence of throat complications.<sup>8,11,14,16,18</sup> This study also found that multiple attempts at intubation was also not a significant factor for the development of POST.

Oczenski et al. and Kloub et al. reported that the category of personnel performing airway management did not affect the incidence of sore throat.<sup>2,18</sup> Similar finding was approached in this study.

It has been suggested that the use of suxamethonium may increase sore throat, possibly due to fasciculation and subsequent myalgia of striated pharyngeal muscle fibres.<sup>7,14</sup> This study, however, found there is no significance difference between use of vecuronium or suxamethonium or no use of muscle relaxants and incidence of POST. There was no difference between those patients whose airway access was easy or difficult, and with the use of oropharyngeal airway and incidence of POST.

Studies have described that the risk of postoperative sore throat increases with the duration of anaesthesia and is actually self-explanatory.<sup>3,7,8,9,18,22</sup> The present study also shows higher rate of sore throat in patients with whose anaesthesia time was more than 2 hours. On the contrary, some authors, Joshi et al. Christensen et al. and Harding and McVey have reported that duration of anaesthesia does not make any difference in incidence of sore throat.<sup>10-12</sup>

All the cases of postoperative sore throat couldn't be directly followed up by the primary researcher (not involved in direct patient care). Similarly, other confounders which can affect the incidence of POST, such as type and size of airway devices, tube cuff pressure, use of suction catheters for suctioning of the patients, smoking habits of the patient could not be studied in the present study.

## CONCLUSION

Postoperative sore throat is a common complication of airway instrumentation in general anaesthesia that can lead to discomfort after surgery. The overall incidence of postoperative sore throat in this study was 50.8%. Airway device ETT, female patients and increased duration of anaesthesia were associated with increased postoperative sore throat rates. A better understanding of the factors responsible for increased incidence of postoperative sore throat and appropriate care especially during selection of airway device can help to reduce the incidence of postoperative sore throat and increase patient's comfort.

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## REFERENCES

- Scuderi PE. Postoperative sore throat more answers than questions. *Anesth Analg* 2010;14:831-832.
- Oczenski W, Krenn H, Dahaba AA. Complications following the use of the Combitube, tracheal tube and laryngeal mask airway. *Anesthesia* 1999; 54:1161-65.
- Biro P, Seifert B, Pasch T. Complaints of sore throat after tracheal intubation: a prospective evaluation. *European Journal of Anaesthesiology* 2005; 22:307-11.
- Maruyama K, Sakai H, Miyazawa H, Todal N, Imanuma Y, Mochizuki N et al. Sore throat and hoarseness after total intravenous anaesthesia. *British Journal of Anaesthesiology* 2004; 92:541-3.
- Jones PM, Armstrong KP, Armstrong PM, Cherry RA, Harle CC, Hoogstra J, et al. A comparison of glidescope videolaryngoscopy to direct laryngoscopy for nasotracheal intubation. *Anesth Analg* 2008;107(1):144-8.
- Jaensson M, Olowsson LL, Nilsson U. Endotracheal tube size and sore throat following surgery: a randomized controlled study. *Acta Anaesthesiol Scand* 2010;54:147-53.
- El-Boghdady K., Bailey CR, Wiles MD. Postoperative sore throat: a systematic review. *Anaesthesia* 2016;71: 706-17.
- Edomwonyi N P, Ekwere L T, Omo E, Rupasinghe A. Postoperative Throat Complications after Tracheal Intubation. *Annals of African Medicine* 2006;5(1):28-32.
- Ahmed A, Abbasi S, Ghafoor HB, Ishaq M. Postoperative sore throat after elective surgical procedures. *Journal of Ayubedic Medical College Abbottabad*. 2007; 19(2):12-4.
- Joshi GP, Inagaki Y, White PF, Taylor-Kennedy L, Gevirtz C et al. Use of the laryngeal mask airway as an alternative to the tracheal tube during ambulatory anaesthesia. *Anesth Analg* 1997; 85:573-77.
- Christensen AM, Willemoes-Larsen H, Lundby L, Jakobsen KB. Postoperative throat complaints after tracheal intubation. *British Journal of Anaesthesia* 1994;73:786-7.
- Harding CJ, McVey FK. Interview method affects incidence of postoperative sore throat. *Anaesthesia* 1987; 42: 1104-7.
- 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.
- McHardy FE, Chung F. Postoperative sore throat: cause, prevention and treatment. *Anaesthesia*. 1999; 54: 444-53.
- Dingley J, Whitehead MJ, Wareham K. A comparative study of the incidence of sore throat with the laryngeal mask airway. *Anaesthesia* 1994;49: 251-254.
- Higgins PP, Chung F, Mezei G. Postoperative sore throat after ambulatory surgery. *British Journal of Anaesthesia* 2002; 88: 582-584.
- Cambay O, Celebi N, Sahin A, Celiker V, Ozgen S, Aypar U. Ketamine gargle for attenuating postoperative sore throat. *Br J Anaesth* 2008;100:490-3.
- Kloub R. Sore throat following tracheal intubation. *Middle East J Anaesthesiol* 2001; 16: 29-40.
- Tennant I, Augier R, Crawford-Sykes A, Ferron-Boothe D, Meeks-Aitken N, Jones K. et al. Minor Postoperative Complications Related to Anaesthesia in Elective Gynecological and Orthopedic Surgical Patients at a Teaching Hospital in Kingston, Jamaica. *Revista Brasileira de Anestesiologia*. 2012;62:188-192.
- Shroff, Prerana P, Kamath, Surekha K. Randomized comparative study between the Proseal laryngeal mask airway and the endotracheal tube for laparoscopic surgery. *Journal of Anesthesiology* 2006;11.
- Hung NK, Wu CT, Chan SM, Lu CH, Hang YS, Yeh CC et al. The effect on postoperative sore throat of spraying the endotracheal tube cuff with benzydamine hydrochloride, 10% lidocaine, and 2% lidocaine. *Anesth Analg* 2010; 111:882-6.
- Rieger A, Brunne B, Hass I, Brummer G, Spies C, Striebel H et al. Laryngo-pharyngeal complaints following laryngeal mask airway and endotracheal intubation. *Journal of Clinical Anesthesia* 1997 Feb; 9(1):42-47.