Section: Anesthesia

Original Research Article

INCIDENCE OF POSTOPERATIVE SORE THROAT IN PATIENT UNDER GENERAL ANESTHESIA WITH ENDOTRACHEAL INTUBATION

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Abstract

Background: Endotracheal intubation is a technique in general anesthesia which provide us accessibility of the airway for controlled ventilation yet it is not free of side effects, POST (Postoperative sore throat) is top among them. It is a common complication and can lead to dissatisfaction after surgery. Postoperatively it seems that most of the signs and symptoms are the result of a mucosal injury which leads to inflammation caused by the process of airway instrumentation. Factors associated with the development of postoperative sore throat are like female sex, difficult intubation, Succinylcholine use, high endotracheal cuff pressures, airway suctioning, long duration of surgery, laryngeal masks, mucosal injury during laryngoscopy, use of oropharyngeal airway and large size endotracheal tubes. **Materials and Methods:** This was a cross sectional observation study conducted in 400 patients in Dr Susheela Tiwari Government Hospital, Haldwani Uttarakhand India. Patients were interviewed to determine incidence and associated factors for developing postoperative sore throat. **Result:** The overall incidence of postoperative sore throat was observed to be 54.25 % in the present study. **Conclusion:** High incidence of postoperative sore throat has been found in our hospital setting. We recommend smaller size of endotracheal tube, decrease in number of attempts of intubation decrease in incidence of postoperative sore throat.

INTRODUCTION

Endotracheal intubation is one of the most important and essential skills performed by healthcare providers. The patient's airway is visualized using a conventional laryngoscope, video laryngoscope or a flexible bronchoscope and an endotracheal tube is inserted into the trachea.[1] Endotracheal intubation is proven to be a lifesaving procedure that has been used in emergency, ICU, and operating room (OR) for decades. Indications of endotracheal intubation include providing mechanical ventilation in respiratory failure, cardiac arrest, postoperative ventilation in ICU and to secure airway from aspiration in unconscious patients. A Glasgow Coma Scale of 8 or less is generally considered an indication for endotracheal intubation. Anesthesiologists frequently intubate and mechanically ventilate patients to provide general anesthesia for various surgical procedures. There are no absolute contraindications to intubation, and the decision to place a definitive airway should take into consideration the patient's clinical condition.[2]

Endotracheal intubation is one of the commonest anesthetic procedures which can cause complications in the perioperative period.[3] Proper assessment of risk and benefits and plan for managing complications is important before intubating any patient. Some of these complications include hypertension, tachycardia, airway trauma, bleeding, oral and dental trauma, endobronchial intubation, bronchospasm, laryngeal oedema and postoperative sore throat (POST). POST is one of the common postoperative complications in patients receiving general anethesia with intubation. Though its prevalence in quite high, it is more often neglected and is an important cause of perioperative morbidity.[4] It is sometimes regarded as highly uncomfortable and distressing condition causing extreme patient dissatisfaction.[5,6] In many studies Postoperative sore throat (POST) is listed as patients' most undesirable outcome in the postoperative period.[7,8] It is well recognized that reporting of sore throat is affected by the method of questioning that is whether the questions are asked directly or indirectly.[9] POST can present as pain and

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discomfort in throat, laryngitis, tracheitis, hoarseness, cough, or dysphagia. Postoperatively it seems that most of the signs and symptoms are the result of a mucosal injury which leads to inflammation caused by the process of airway instrumentation. Its postulated etiology has been associated with mucosal dehydration or oedema, tracheal ischemia secondary to the pressure of endotracheal tube cuffs, aggressive oropharyngeal suctioning, and mucosal erosion from friction between delicate tissues and the ETT.[10,11]

Previous studies have described a number of factors contributing to the development of postoperative sore throat; like female sex, smoking, difficult intubation, Succinylcholine use, high endotracheal cuff pressures, airway suctioning, long duration of surgery, laryngeal masks, mucosal injury during laryngoscopy, use of oropharyngeal airway and large size endotracheal tubes. Postoperative sore throat appears to be the result of an inflammatory process; the tracheal mucosa has been found to release inflammatory mediators, which are released following local responses to cell damage during intubation and exert their effects on sensory nerves in the airways.[12]

Preventing POST or reducing its severity can not only improve the patient satisfaction, but also decrease the length of hospital stay and overall cost of care.[13] Various pharmacological and non-pharmacological methods with variable success rates have been used for attenuating POST. Use of a smaller-sized tube, lubrication with water-soluble jelly, and minimizing intracuff pressure have been recommended by the past researchers. Pharmacological methods prescribed include application of lignocaine jelly over the tracheal tube, lozenges, lignocaine and ketamine gargles, steroid nebulization etc.[14]

Many studies have been performed in the past to determine the incidence of postoperative sore throat but the majority of them have been conducted in western countries. There is a paucity of data related to POST in the north Indian population. So, this study was planned to assess the incidence of postoperative sore throat and its associated factors among patients undergoing elective surgery under general anesthesia with endotracheal intubation.

MATERIALS AND METHODS

This was a cross sectional observational study conducted in 400 patients undergoing surgery under general anesthesia with endotracheal intubation in Dr Susheela Tiwari Government Hospital, Haldwani. The sample size was determined by taking the following assumption, the proportion of POST is 59.6%. The confidence interval of 95% and the margin of error of 0.05. The sample size was determined using the following single-population formula:

$N = z2(p)(1-p) /d2$

Where, n = sample size

z = Confidence interval (1.96)

P = prevalence (0.596)

d = margin of sampling error to be tolerated (0.05).

To get the sample size with a confidence interval of 95% and a margin of error of 5%

$n = (1.96*1.96)0.596(1-0.596)/0.05*0.05 = 370$

By applying a finite population correction formula, the final sample size was calculated as:

$Nf = n/(1+n/N)$

Where Nf = final sample size

n = the minimum sample size

N= Total no of Surgeries done in STH

Inclusion Criteria

1. American society of Anesthesiologist grade 1 and 2
2. General anesthesia with endotracheal intubation
3. Age 18 to 65 years

Exclusion Criteria

1. Patients with impaired cognitive ability
2. Unconscious patient
3. Upper respiratory tract infection before surgery
4. Patients undergoing head and neck surgery.
5. Use of nasogastric tube or double lumen tube.
6. Preoperative sore throat.
7. Patients on steroid, NSAIDs and MgSO4.

The data collection procedure included a chart review and patient interview using a questionnaire. The recorded information included the patient's age, gender, body mass index (BMI), ASA grade, patient's position, endotracheal tube (ETT) size, muscle relaxant, number of attempts, Cormack-Lehane (CL) grade, duration of surgery, and usage of the oral airway. The experience of the anesthesiologist performing the procedure was also noted.

In the postoperative period, patients were interviewed at 2-hour, 4-hour, 16 hour and 24-hour time intervals for postoperative sore throat which was graded as following:

Grade 1- No sore throat

Grade 2- Mild sore throat (patient complained of mild irritation, scratching, and pain himself)

Grade 3- Moderate sore throat (patient complained of irritation, scratching, and pain himself)

Grade 4- Severe sore throat (patient complained of severe pain, difficulty in swallowing, coughing, or in distress)

All collected data were tabulated and subjected to statistical analysis.

RESULTS

On statistical analysis the overall incidence of postoperative sore throat was observed to be 54.25 % in the present study and age group, gender, body mass index (BMI), number of attempts, CL (Cormack lehane) grade, duration of surgery, endotracheal tube (ETT) size and usage of oral airway were found as significant factors associated with incidence of postoperative sore throat with p value <0.05.

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However, ASA Grade, patient's position, muscle relaxant and experience of anesthesiologist were not found to be the significant factors in the present study.

Table 1: Incidence of postoperative sore throat in study participant

Post-Operative Sore Throat	Number	Percentage
YES (GRADE 2 AND 3)	217	54.25%
NO (GRADE 1)	183	45.75%
Total	400	100%

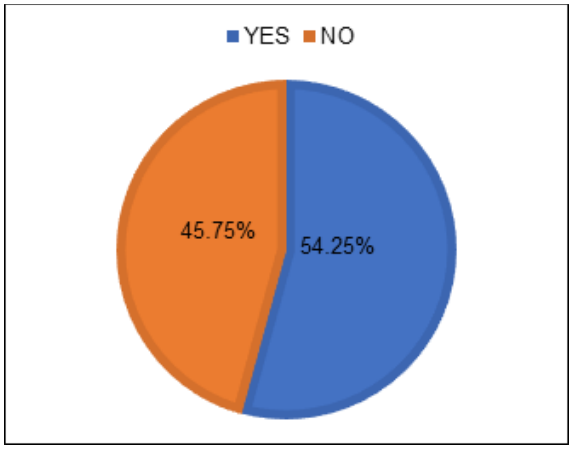

Figure 1: Incidence of Postoperative Sore Throat in Study Participants

DISCUSSION

Postoperative sore throat can occur as a complication in patients who have undergone surgery under general anesthesia. Its effects include damage to the epithelium and mucosal cells caused by airway securement, damage to the vocal cords, congestion, blood clots, and factors such as an inappropriately large tube, cuff shape, cuff pressure, and airway securement. Notably, there are individual differences in pain thresholds, and the sensation of pain is affected by mental states, such as anxiety, and varies from person to person.[15] Therefore, the present study was planned and conducted in the Department Of anesthesiology, critical care, pain and palliative Medicine, GMC, Haldwani, Nainital (Uttarakhand) to assess the incidence of postoperative sore throat and to study the factors associated with it.

The incidence of postoperative sore throat was found to be 54.25% in the present study. In our study, patients were assessed at 2-hour, 4-hour, 16-hour, and 24-hour time intervals for post-operative sore throat. We observed that 54.25% of cases showed postoperative sore throat at 2-hour, which decreased to 39.75% at 4-hour, 1.75% at 16 hours, and 0% at 24hours. The majority of patients with sore throat were in the age group 21-30 years and age was found to be a significant factor associated with a postoperative sore throat ($p<0.05$). These findings suggested that young age is a factor in POST.

We observed a greater incidence of POST in females as compared to males, i.e., 60% in females and 35.79% in males. The reason why female patients have a higher risk of POST is unknown, yet different reasons have been postulated for this. Some authors relate it to the anatomical difference in the larynx between males and female.[16] Endotracheal tubes size were also found to be a significant factor in our study ($p<0.05$). This might be because with the increasing diameter of the ETT there is an increase in tightness with the tracheal mucosa, which causes direct trauma to the tracheal mucosa and possibly results in postoperative sore throat. Body mass index (BMI) was found to be a significant factor for POST in the present study with a maximum incidence of 90.9% among obese patients and the least in underweight patients i.e., 40.0%. We have observed that the incidence of postoperative sore throat increases with an increase in the number of attempts. 94.7%, 68.5%, and 40.2 % are the incidences of 3 attempts, 2 attempts, and 1 attempt respectively it may be due to direct trauma to the larynx and causes pain in the throat in the postoperative period. Incidence of postoperative sore throat with the use of oral airway is 70.8% and without oral airway 50.6%. CL grade was also found as an association factor for the incidence of POST. Incidence of POST is 85.1%, 55.1%, and 27.2% in CL grades III, II & I. On statistical analysis, age group, gender, body mass index (BMI), number of attempts, CL (Cormack lehane) grade, duration of surgery, endotracheal tube (ETT) size and usage of oral airway were found as significant factors associated with incidence of postoperative sore throat with p value <0.05. However, ASA Grade, patient's position, muscle relaxant and experience of anesthesiologist were not found to be the significant factors in the present study.

CONCLUSION

The present study highlighted high incidence of postoperative sore throat (54.25%) in our hospital setting. Postoperative sore throat is a frequent finding after general anesthesia with tracheal intubation. Although, it is largely self-limiting, but still remains a significant cause for discomfort of the patient. Age group, gender, body mass index (BMI) number of attempts, Cormack lehane (CL) Grade, endotracheal tube (ETT) size, duration of surgery, and usage of oropharyngeal airway were found to be significant factors associated with incidence of post-operative sore throat in this study. We recommend smaller size endotracheal tube, avoid using oropharyngeal airway and decrease in number of attempts of intubation to decrease incidence of postoperative sore throat. Thus, further improvement in patient comfort could be expected by focusing on these factors. However,

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further studies with larger sample size are required to validate these findings.

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