

Prospective Observational Study on the Incidence of Postoperative Sore Throat in Patients undergoing Endotracheal Intubation under General Anaesthesia

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Abstract

Background: There are various risk factors associated with Post Operative Sore Throat (POST). The objective of the study was to study the incidence of post operative sore throat in patients undergoing surgeries under general anaesthesia requiring endotracheal intubation. **Materials and Methods:** A total of 175 patients fulfilling the inclusion criteria were enrolled in the study. The incidence of post operative sore throat was observed at 1, 6 and 24 hours post extubation and its correlation with the mallampatti score, designation of the intubating anaesthesiologist and the duration of surgery. **Results:** In males the incidence was 50% and in females it was 47% with an overall incidence of 48%. In patients with mallampatti class 1 the incidence of POST was 41% and in class 2 it was 57.9%. Among the anaesthesiologists, 1st, 2nd and 3rd year PGs were 45.7 %, 50.7%, 48.6% and 44.4% respectively. The incidence of POST in patients in whom duration of surgery was between 1 to 2 hours was 39.4 %, 2 to 3 hours was 49.4 % and 3 to 4 hours was 68 %. **Conclusion:** The incidence of POST has no significant difference between female and male patients. Lower mallampatti score is associated with lower incidence. Designation of anesthetist has no impact on the incidence. Lower the duration of surgery, lower the incidence.

Keywords: Postoperative Sore Throat (POST); Endotracheal Intubation; Mallampatti Score.

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Introduction

General anaesthesia is one of the most common type of anaesthesia practiced all over the world. Airway management is the most important skill for a clinical anaesthesiologist as it is an integral part of general anaesthesia which facilitates ventilation and oxygenation as well as a mode for anaesthetic gas delivery [1]. Protective airway reflexes, airway patency, and breathing pattern are altered for patients under general anaesthesia due to the effects of intravenous, inhalational agents, opioids and muscle relaxants [2]. To maintain an open airway

and regulate breathing, some form of airway device is to be placed after the patient is unconscious. To enable mechanical ventilation, the most common and a safe method to secure airway is by the placement of an endotracheal tube [3]. The endotracheal tube usage has many advantages like protection against aspiration and gastric insufflation. They are more effective for ventilation and oxygenation when compared to other airway devices and also facilitates suctioning and delivery of oxygen and mixture of anaesthetic gases [4]. Although there are advantages of endotracheal intubation it is also associated with many

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disadvantages such as, sore throat along with injury to the lips, tongue, gums, throat, breakage/damage to the teeth and also may be associated with hoarseness of voice from temporary or permanent damage to the vocal cords along with hemodynamic alterations during laryngoscopy [5].

Sore throat is defined as pain or scratchiness or irritation of the oropharynx usually due to mucosal injury and worsens during swallowing. Postoperative sore throat is a common complaint after tracheal intubation for general anaesthesia. It can lead to discomfort after surgery and may delay a patient's return to normal routine activities. It is the 8th most undesirable outcome in postoperative period. Its incidence varies from 0-50% in most research studies. But some studies report even a higher incidence with peak in 2-6 hrs of extubation and gradually decreases, and the most common cause being mucosal injury due to over inflation of the cuff of the endotracheal tube and any vocal cord injury [6].

There are many factors contributing to the development of post operative sore throat which includes, Mallampatti score of the patient, duration of the surgery as well as the designation of the intubating anaesthetist.

So, we designed this study which includes all the above mentioned factors to find the incidence of post operative sore throat in our population and the factors contributing to it.

Materials and Methods

A prospective, observational study was carried out at Sri Manakula Vinayagar Medical College and Hospital, Puducherry during the period of October 2014 to July 2016. This study was conducted as per Good clinical practice Guidelines (GCP) defined by WHO. Sample size (n=175) was calculated using 95% confidence interval, 80 % power and 7% alpha error with incidence of postoperative sore throat following endotracheal intubations of 28%.

Inclusion Criteria

All ASA I and II patients of both genders aged between 18 to 65 years were included in the study.

Exclusion Criteria

ASA III & IV patients, patients posted for surgeries of oral cavity and pharynx, unpredicted

or long duration of surgeries that has taken more than 4 hours, anticipated difficult airways (Mallampatti 3 and 4), procedure that has taken more than three attempts at intubation and visual trauma during intubation were excluded from the study

Procedure

Pre anaesthetic checkup was done a day prior to the surgery and the patients were kept fasting for 6 to 8 hours. On the day before surgery, patients received T. Ranitidine 150 mg in the night and at 7AM. On the day of surgery along with T. Metoclopramide 10 mg. The Patients were shifted to waiting room and again re-assessed. An intravenous line was started using a 18G venflon. Anaesthesia was induced by Inj. Glycopyrolate 0.2 mg IV, Inj. Fentanyl 2mcg/kg IV, Inj. propofol 2 mg/kg IV, patients were intubated using the appropriate size endotracheal tube (8-8.5 mm size tube for male patients and 7-7.5 size tube for female patients) and macintosh blade (4 size for male patients and 3 size for female patients) following which intubation was facilitated by Inj.succinyl choline 2mg/kg and anaesthesia was maintained by 33% O₂ in N₂O along with an inhalational anaesthetic and muscle relaxant as per the choice of the intubating anaesthetist. At the end of surgery the oropharynx was cautiously suctioned using a soft suction catheter and the patients were extubated after standard reversal of muscle relaxation with neostigmine and glycopyrolate. Outcome assessment of incidence of sore throat was carried out at 1, 6 and 24 hours of post extubation in the postoperative ward and was assessed using a 4-point scale.

Score

Score 0: No sore throat at any time after the surgery

Score 1: The patient answered when asked about sore throat (minimal sore throat)

Score 2: The patient complained of sore throat on his/her own (moderate sore throat)

Score 3: The patient is in obvious distress (severe sore throat)

Results

Demography: Out of 175 patients in the overall population 117 patients are females and 58 patients

are males. Among the male patients, 29 (50%) had no POST whereas 26 (44.8%) and 3 (5.2%) had minimal and moderate POST respectively. 62 (53%) of the females patients experienced no POST the rest of which 45 (38.5%), 9 (7.7%) and 1 (0.9%) had POST scores of 1, 2 and 3 respectively at 1hr which was reduced in observations at 6 and 24 hrs. The overall incidence of POST was 48% and the incidence among male and female patients was not significantly different (Figure 1, 2).

Mallampatti score: 99 patients among the study population were patients with Mallampatti grade 1 amounting to 57 percentage and 76 patients among the study were patients with Mallampatti grade 2 amounting to 43 percentage. POST distribution among the mallampatti grade 1 was

found to be 33%, 6% and 1% of score 1, 2 and 3 respectively. Out of the 76 grade 2 cases, score 1 was found to be 42.1% followed by score 2 (7.9%) with no incidence of severe (score 3) POST. 75% and 92% of patients relieved from POST at 24 hrs (Figure 3).

Designation of Intubating Anaesthetist: Among the total population, intubation was performed by, First Year PG (26.3%), Second Year PG (38.3%), Third Year PG (20%) and Consultant (15.4%) and the incidence of POST was found to be 45.7%, 50.7%, 48.6% and 44.4% respectively (Table 1).

Duration of surgery: Out of 175 study population, 71 patients had duration of surgery for 1-2 hours amounting for 41%. 79 patients had duration of surgery for 2-3 hours amounting for 45%.

Table 1: Incidence of POST In Relation To The Designation Of Intubating Anaesthesiologist

Anaesthetist (n=175)	Hours	POST (%)			
		Score 0	Score 1	Score 2	Score 3
First Year PG (n=46)	1 hr	54.3	32.6	10.9	2.2
	6 hrs	65.2	19.6	6.5	0
	24 hrs	78.3	19.5	2.2	0
Second Year PG (n=67)	1 hr	49.3	40.3	10.4	0
	6 hrs	70.1	25.4	4.5	0
	24 hrs	92.5	7.5	0	0
Third Year PG (n=35)	1 hr	51.4	48.6	0	0
	6 hrs	88.6	11.4	0	0
	24 hrs	97.1	2.9	0	0
Consultant (n=27)	1 hr	55.6	44.4	0	0
	6 hrs	85.2	14.8	0	0
	24 hrs	88.9	11.1	0	0

The rate of POST was not significantly related to the intubating anaesthesiologist

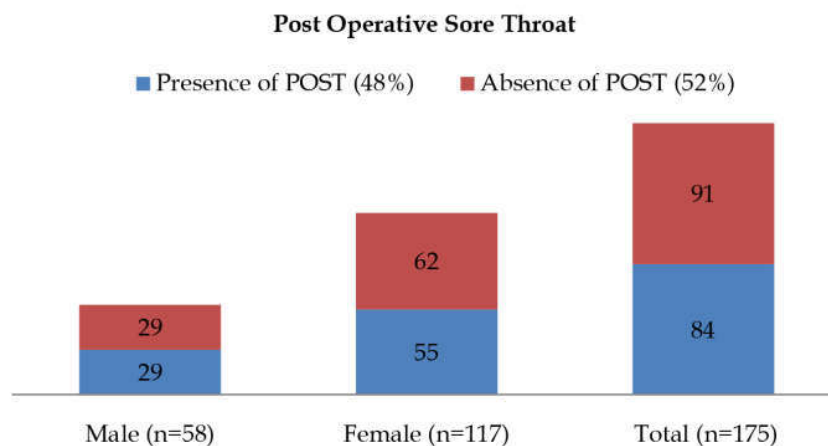


Fig. 1: Overall Incidence Of POST

Table 2: Incidence Of POST In Relation To The Duration Of Surgery

Duration of Surgery (n=175)	Hours	Post (%)			
		Score 0	Score 1	Score 2	Score 3
1 to 2hrs (n=71)	1 hr	60.6	28.2	9.8	1.4
	6 hrs	76.1	16.9	7	0
	24 hrs	90.1	9.9	0	0
2-3hrs (n=79)	1 hr	50.6	44.3	5.1	0
	6 hrs	73.4	20.3	6.3	0
	24 hrs	86.1	12.7	1.3	0
3 to 4 hrs (n=25)	1 hr	32	64	4	0
	6 hrs	76	24	0	0
	24 hrs	96	4	0	0

The rate of POST increased with an increased duration of surgery

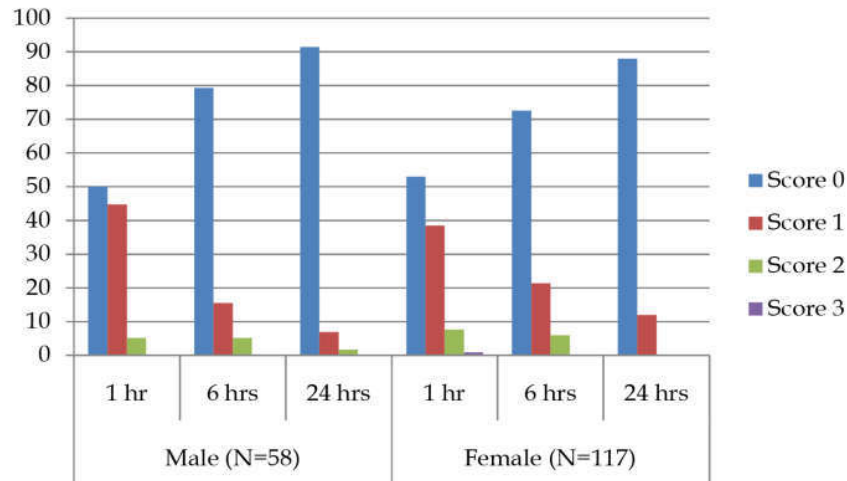
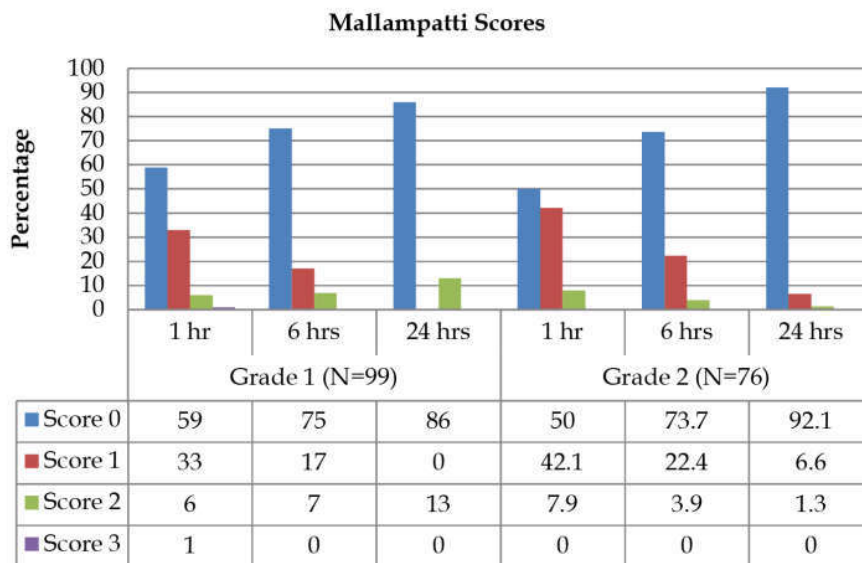


Fig. 2: Incidence of POST In Patients At 1, 6 And 24 Hours
The incidence of POST among the male and female patients were not significantly different



The overall incidence of POST in patients with Mallampatti score 1 was 41 % & Mallampatti score 2 was 57.9%
Fig. 3: Incidence of POST In Patients With Mallampatti Grade 1 & 2 At 1, 6 And 24 Hours

25 patients had duration of surgery for 3-4 hour amounting for 14%. The overall incidence of POST in patients undergoing surgery for 1-2 hours was 39.4%, 2-3 hours was 49.4% and 3-4 hours was 68 % (Table 2).

Discussion

Causes of post operative sore throat are multifactorial [7]. So, we incorporated the important factors causing POST such as, mallampatti classification of the patient, duration of surgery and designation (experience) of the intubating anaesthesiologist.

There are many factors contributing to postoperative sore throat such as size of the ETT used along with the technique of insertion, use of any lubricant, the cuff pressure used for inflation, associated airway design, length of procedure and sometimes with the anaesthetic administered and the evaluation technique [8]. Tracheal intubation is commonly associated with an increase in number of polymorphonuclear cells in the tracheal tissue and plasma levels of interleukin 6, which suggests an inflammatory response to the presence of the endotracheal tube itself or to some aspects of the intubation process [9].

Routine tracheal intubation for elective surgical procedures can result in pathological changes. High intracuff pressure is associated with nerve palsies due to neuropraxia, nerve compression and nerve damage which may also account for postoperative throat symptoms. Although these symptoms may be considered to be minor by some, they are important measures of quality of care. In most cases, the symptoms resolve spontaneously without intervention, but in a few cases, they may persist. When the symptoms do occur, patients perceive them as mild to severe and often discomforting. Careful insertion technique of the tracheal tube is of paramount importance in the prevention of postoperative sore throat [10].

PP Higgins et al. studied the incidence of post operative sore throat in 5264 patients undergoing surgeries requiring endotracheal intubation and observed that the overall incidence of POST was 45.4% [11]. Brio P et al. studied the incidence of POST in 809 patients undergoing elective surgeries requiring endotracheal intubation under general anaesthesia and observed that the overall incidence of POST was 40% [12]. Our results demonstrate that the overall incidence of POST was 48%.

Maria Jaensson et al studied gender differences in sore throat and hoarseness following endotracheal tube or laryngeal mask airway and observed that there was no significant difference in the incidence of post operative sore throat after using endotracheal tube in males and females [13]. A.M. Christensen et al. observed that the incidence of post operative sore throat was significantly higher in females when compared to males [14]. Our results demonstrate that the overall incidence of POST in male patients was 50% and overall incidence of POST in female patients was 47%.

S. Inoue et al. observed that there was no difference between tracheal intubation by trainees and tracheal intubation by consultant anaesthetists in the incidences of post operative sore throat [15]. Biro P et al could find no influence on the occurrence or intensity of throat complaints by the professional assignment or the length of professional experience of the personnel involved [12]. Our study demonstrated that, the incidence of POST in patients intubated by first year post graduate students was 45.7%, the incidence of POST in patients intubated by second year post graduate students was 50.7%, the incidence of POST in patients intubated by third year post graduate students was 48.6% and the incidence of POST in patients intubated by consultants was 44.4%.

Maria Jaensson et al observed that there was no significant association between the Mallampati Score, duration of anaesthesia in the risk of developing POST [16].

In our study we observed that the incidence of POST in patients in whom duration of surgery was between 1 to 2 hours was 39.4%, the incidence of POST in patients in whom duration of surgery was between 2 to 3 hours was 49.4% and the incidence of POST in patients in whom duration of surgery was between 3 to 4 hours was 68%. So, in our study we observed that as duration of surgery increases the incidence of POST increases and this may be due to changes of cuff pressure with time. But in our study we did not measure cuff pressure intraoperatively.

In our study we observed that the incidence of POST in patients with mallampatti score 1 was 41% and incidence of POST in patients with mallampatii score 2 was 57.9%.

In our study we used conventional direct laryngoscope for inserting the endotracheal tube. Hence, we could not rule out laryngoscopy related trauma as a cause of POST. A fibre-optic

examination of the supraglottic area, pharynx and glottis area can be done after securing the ET tube to rule out laryngoscope related trauma which was not possible in our institution because of the limitations in the availability of equipment. Further studies are warranted using a fibre-optic bronchoscopy or other atraumatic methods of ET tube insertion which can ascertain to the cause of POST.

Conclusions

On an overall we observed that the rate of POST in the present study is in concordance with the previously reported studies. Sex of the patient has no influence on the incidence POST. Lower the mallampatti class lower the incidence of POST. Lesser the duration of surgery lesser the incidence of POST. Designation/Experience of intubating anaesthetist has no influence on the incidence of POST. Incidence and severity of POST reduces with time postoperatively.

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