



Overview of Sore Throat in Patients Post General Anesthesia with an Endotracheal Tube at RSUD Dr. Soedirman Kebumen in 2023

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ABSTRACT

Complications that many respondents complained about after surgery with general anesthesia, namely Post-Operative Sore Throat (POST). Post-surgery sore throat is a minor complication that occurs in ETT intubated patients and results in dysphonia, dysphagia and odynophagia. In Indonesia, 20%–60% of respondents complain of sore throat after surgery with GA-ETT. The purpose of this study was to see the description of post-general anesthesia sore throat with ETT at Dr. Soedirman Kebumen. The design of this study is a descriptive cross-sectional approach using the POST instrument. The research was conducted from March to April 2023 in the recovery room with 50 respondents. Data collection by accidental sampling and analyzed using univariate test. The results of the study showed that many respondents did not experience throat pain, totaling 20 respondents (40%) and complaining that the most complaints were mild pain, amounting to 17 respondents (34%). This study shows that the majority of patients only complain of mild pain and no sore throat.

Keywords : Throat pain, general anesthesia, Endotracheal Tube (ETT)

1. INTRODUCTION

Endotracheal Tube (ETT) intubation is a procedure performed using an ETT tube inserted into the respiratory tract through the nose or mouth with the assistance of a laryngoscope. The success of ETT intubation is determined by the ease of laryngoscopy (blade resistance and jaw relaxation during laryngoscopy), the movement and position of the vocal cords, and the response to the ETT intubation procedure, which can lead to various complications, both mild and severe (Pramono, 2017). Common complaints following ETT intubation include hoarseness, cough, and postoperative throat pain. Throat pain,

hoarseness, and cough complaints are caused by trauma and irritation in the airway (Susianto dkk., 2020).

The incidence of throat pain increases annually, reaching up to 50%, and is more commonly experienced by women (17%) than men (9%), and it remains a challenge to fully address (Satriyanto et al, 2014) in (Fahriyani dkk, 2017). Meanwhile, in Indonesia, 20%–60% of respondents complain of post-surgery sore throat due to ETT intubation techniques (Susianto et al, 2020). Post-surgery sore throat caused by ETT intubation techniques is characterized by discomfort, pain, or irritation in the throat, and it can cause pain when swallowing. This sore throat can subside

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quickly but may last for one or two days or even longer. Throat pain typically occurs within the first 24 hours in respondents after surgery with general anesthesia and ETT intubation techniques (Millizia & Maulina, 2018).

In the study by Rianti (2020) titled "Prevalence of Postoperative Throat Pain with the Application of VCO Lubrication during LMA Placement," there is a prevalence of 17.8% to 21.4% for complaints such as nausea, throat pain, cough, and hoarseness following ETT intubation. Nausea, throat pain, cough, and hoarseness do not lead to severe complications but can cause stress and result in poor memories experienced by respondents after ETT intubation.

Postoperative throat pain with general anesthesia and ETT intubation is caused by pharyngolaryngeal mucosa trauma due to laryngoscopy and the use of an endotracheal tube. Additionally, other contributing factors include the placement of a NasoGastric Tube (NGT) and the use of suction secretion devices (Jaensson et al, 2014; Irawan, 2019). Throat pain after surgery with general anesthesia and ETT intubation is influenced by several factors, including equipment-related factors, patient-related factors, and the method of ETT intubation. Risk factors that play a role in the development of throat pain complaints include age, gender, smoking history, ETT size, and the duration of ETT placement (El-Boghdadly et al., 2016; Millizia & Maulina 2018).

Pain is an uncomfortable sensation that can affect the hemodynamic status of patients. Throat pain in patients receiving general anesthesia with an ETT usually does not have severe consequences. However, it can cause significant disturbances for the respondents, leading to increased duration and costs of the procedure. Additionally, it can result in significant disruptions for the respondents and leave a negative impression on the surgery. As a consequence of this throat pain, it can lead to respondent dissatisfaction, potentially resulting in claims against the hospital (Fahriyani dkk, 2017). Based on these considerations, the research problem in this study is an overview of throat pain in patients post-general anesthesia with an endotracheal tube. The objective of this research is to examine the description of throat

pain following general anesthesia with an ETT and to identify the factors influencing pain at RSUD Dr. Soedirman Kebumen.

2. RESEARCH METHODS

This study is a non-experimental quantitative research with a cross-sectional descriptive design. The sample and population in this study consist of all patients after general anesthesia with ETT intubation who meet the inclusion criteria, which are patients classified as American Society of Anesthesiologists (ASA) 1 and 2 and are fully conscious during data collection. Exclusion criteria include patients with cognitive impairments, patients with NGT placement during intubation, and patients undergoing tonsillectomy. The research was conducted in the IBS recovery room of RSUD Dr. Soedirman Kebumen from March 25 to April 30, 2023, and the predetermined number of respondents is 50 individuals, calculated using the Slovin formula.

Data collection in this research was conducted using a questionnaire instrument. The data was gathered using an accidental sampling technique. The collected data were then analyzed using descriptive statistics or univariate tests with the aid of a computer. The researcher conducted a pre-operative visit in the premedication room before the respondents underwent surgery, which included assessing patient information such as name, age, gender, and their smoking history through interviews. Subsequently, after the surgery, while the patients were in the recovery room, the researcher collected data on the ETT size and the duration of ETT placement from the patients' medical records. The degree of throat pain in the respondents was assessed through interviews and the use of the POST (Post-Operative Sore Throat) instrument.

To describe throat pain with respect to each factor, the researcher in this study employed univariate analysis. The factors examined included ETT tube size, smoking history, and gender. Meanwhile, for age and the duration of endotracheal tube placement, the researcher used mean, median, minimum, and maximum values for analysis.

In this research, ethical principles were followed, which were categorized into three

parts: the principle of benefit, the principle of respecting the rights of subjects, and the principle of fairness.

3. RESULT AND DISCUSSION

3.1 Research results

Table 1. Frequency Distribution of Throat Pain after Endotracheal Tube (ETT) in Dr. Soedirman Regional Public Hospital Kebumen in 2023 (n=50)

Pain Level	Frequency (f)	Percentage (%)
No Pain	20	40.00
Mild Pain	17	34.00
Moderate Pain	9	18.00
Severe Pain	4	8.00
Total	50	100.00

Table 1 reveals that 30 respondents (60%) experienced throat pain following general anesthesia with an endotracheal tube. Among them, the most common complaint was mild pain, with 17 respondents (34%), while 20 respondents (40%) did not experience throat pain.

Table 2. Description of POST Based on Age and Duration of Endotracheal Tube (ETT) Placement at Dr. Soedirman Regional Public Hospital Kebumen in 2023 (n=50)

Age	No Pain	Mild Pain	Moderate Pain	Severe Pain	Total
N	20	17	9	4	50
Min	19	15	27	41	
Max	56	55	70	53	
Mean	29.65	35.12	42.56	47.50	
Median	29.50	33.00	37.00	48.00	
Std.D	8.337	9.373	13.371	5.196	
Long Installed ETT					
N	20	17	9	4	50
Min	40	45	75	90	
Max	115	95	120	160	
Mean	59.00	67.35	91.67	107.5	
Median	60.00	60.00	90.00	90.00	
Std.D	15.944	15.624	15.411	35.00	

Table 2 presents an overview of throat pain following general anesthesia with an

endotracheal tube based on age and the duration of ETT placement at RSUD Dr. Soedirman Kebumen. From the table above, we can observe that, based on age, the average age of respondents experiencing mild pain is 35 years, with the youngest being 15 years and the oldest 55 years. Respondents experiencing moderate pain have an average age of 42 years, with the youngest being 27 years and the oldest 70 years. Those experiencing severe pain have an average age of 47 years, with the youngest being 41 years and the oldest 53 years.

Based on the duration of endotracheal tube placement, it can be observed that the average duration for respondents experiencing mild pain with the factor of ETT placement duration was 67.35 minutes, with the fastest placement lasting 45 minutes and the longest placement lasting 95 minutes. Respondents experiencing moderate pain had an average duration of 91.67 minutes, with the fastest ETT placement lasting 75 minutes and the longest lasting 120 minutes. For respondents experiencing severe pain, the average duration was 107.50 minutes, with the fastest ETT placement being 90 minutes and the longest being 160 minutes.

Table 3 presents the distribution of postoperative throat pain based on gender, smoking history, and the size of the endotracheal tube (ETT) used by the respondents. In terms of gender, the most severe pain category was observed in males, with 4 individuals (8% of the total male respondents) experiencing severe pain. On the other hand, among females, a higher number did not experience throat pain, with 15 individuals (30% of the total female respondents) reporting no pain.

Based on smoking history, it can be observed that there were 21 patients (42%) who were smokers, while 29 patients (58%) were non-smokers. Regarding smoking history, respondents who experienced severe throat pain were smokers, with a total of 3 respondents (6% of the 21 smokers). In contrast, respondents who did not complain of throat pain were those who did not smoke, comprising 16 individuals (32% of the 29 non-smokers).

Table 3. Description of POST Based on Gender, Smoking History, and ETT Size at RSUD Dr. Soedirman Kebumen in 2023 (n=50)

Factor POST	No Pain f (%) n %	Mild Pain f (%) n %	Moderate Pain f (%) n %	Severe Pain f (%) n %	Total n %
Gender					
Male	5 (10.0)	9 (18.0)	5 (10.0)	4 (8.0)	23(46%)
Female	15 (30.0)	8 (16.0)	4 (8.0)	0 (0.0)	27(54%)
Smoking History					
Yes	4 (8.0)	7 (14.0)	7 (14.0)	3 (6.0)	21(42%)
No	16 (32.0)	10 (20.0)	2 (4.0)	1 (2.0)	29(58%)
ETT Size					
6.5 mm	11 (22.0)	3 (6.0)	0 (0.0)	0 (0.0)	14(28%)
7 mm	9 (18.0)	11 (22.0)	5 (10.0)	1 (2.0)	26(52%)
7.5 mm	0 (0.0)	3 (6.0)	4 (8.0)	3 (6.0)	10(20%)

Based on the ETT size, the number of respondents in each size category is as follows: 14 respondents (28%) had a 6.5 mm ETT, 26 respondents (52%) had a 7 mm ETT, and 10 respondents (20%) had a 7.5 mm ETT. It's noteworthy that no complaints of throat pain were reported for the 6.5 mm ETT size, with 11 respondents (22% of the 14 in this category). On the other hand, severe throat pain was reported by respondents who used the 7.5 mm ETT, with a total of 3 respondents (6% of the 10 in this category).

3.2 Discussion

1. Description of Post-General Anesthesia Throat Pain with Endotracheal Tube

Based on the findings presented in Table 1, it can be observed that the majority of respondents did not experience throat pain, with a total of 20 respondents (40%). The most common complaint among respondents was in the category of mild pain, with 17 respondents (34%) reporting such discomfort. Mild pain in the POST refers to throat pain when the patient speaks. These results are consistent with a study by Eka (2017) which reported a higher incidence of throat pain after endotracheal

intubation compared to the use of the Laryngeal Mask Airway. In this study, 12 respondents (30%) complained of throat pain out of a total of 20 respondents who used an ETT.

The researcher assumes that throat pain after extubation with an endotracheal tube is more frequent, even if it is only mild pain. Throat pain after surgery is primarily due to inflammation that occurs in 30% to 70% of respondents who underwent ETT intubation. The cause of this pain is attributed to local inflammation and irritation in the airway. Throat pain can be a result of the friction between the endotracheal tube and the vocal cords and the membranes of the larynx and pharynx, leading to trauma or irritation of the tonsils, larynx, pharynx, or trachea (Irawan, 2019). These results are consistent with a study by El-Boghdady et al., (2016) which reported that throat pain following endotracheal tube intubation occurred in 40% of 806 surgical procedures.

In this study, it is predominantly observed that respondents do not complain of throat pain. In this regard, the researcher assumes that the higher number of respondents not reporting throat pain may be attributed to several factors. These factors include the experience of the intubation practitioners who perform intubation following established SOPs, which can reduce throat pain resulting from laryngoscopy. Complications following general anesthesia and ETT intubation, especially in the mild category, include throat pain. However, this contributes to increased respondent satisfaction and morbidity after surgery. One of the most common side effects experienced by respondents after surgery is throat pain.

2. Description of post-general anesthesia throat pain with an endotracheal tube based on age, duration of ETT placement, smoking history, gender, and the size of the ETT

Several factors influence throat pain, including gender, age, smoking history, duration of intubation, and the size of the ETT. Based on the factor of age in this study, it is more common to find patients who do not complain of throat pain, with a total of 20 respondents (40%). Respondents experiencing

mild pain had the lowest age of 15 years and the highest age of 55 years. For those in the category of moderate throat pain, the youngest age was 27 years, and the oldest was 70 years. Respondents experiencing severe pain had the youngest age of 41 years and the oldest age of 53 years.

Statistical analysis in this study yielded an average patient age of 35 years. The researcher assumes that the higher number of patients not reporting throat pain is because the respondents are adults with an average age of 35 years. However, existing literature suggests that as age increases, the risk of throat pain experienced by patients also increases.

Age plays a significant role in responding to pain. Adults and elderly respondents may have different responses. With increasing age, there is a likelihood of decreased organ function, as well as the presence of abnormalities and underlying health conditions. This statement aligns with the research by Gemechu et al. (2017), which suggests that patients most commonly complaining of throat pain fall within the age range of 18-60 years, accounting for 58.6%, while respondents experiencing throat pain above the age of 60 years make up only 0.8%.

Based on the duration of ETT placement, the results of the statistical analysis reveal that the average duration for patients not complaining of throat pain is 59 minutes. It is noted that the average duration for respondents experiencing mild pain with the factor of ETT placement duration is 67.35 minutes, with the shortest placement lasting 45 minutes and the longest lasting 95 minutes. For respondents experiencing moderate pain, the average duration is 91.67 minutes, with the quickest ETT placement being 75 minutes and the longest being 120 minutes. Respondents experiencing severe pain had an average duration of 107.50 minutes, with the fastest ETT placement being 90 minutes and the longest being 160 minutes.

The findings of this research are consistent with the study by Irawan, (2019) which indicates that the incidence of throat pain is higher in respondents with longer ETT placement. The reason for this is that the longer

the ETT placement, the higher the disruption of tissue perfusion and the risk of airway mucosal injury. The cuff pressure applied to the airway mucosa is one of the contributing factors to tissue perfusion disturbance. In this study, the researcher assumes that the longer the duration of ETT placement for respondents, the higher the likelihood of throat pain occurring. ETT placement exceeding 90 minutes has a higher chance of experiencing POST.

The duration of ETT placement influences the response to throat pain in respondents. Research by Spiegel (2010) demonstrates that the duration of ETT placement has an impact on the occurrence of throat pain. The longer the ETT is placed, the longer the cuff pressure exerted on the tracheal mucosa. Respondents with ETT placement lasting more than 60 minutes have a higher risk of experiencing pain compared to those with ETT placement for less than 60 minutes. Hence, in this study, more respondents did not report throat pain. The researcher suggests that this is because the majority of respondents had ETT placement durations of 60 minutes or less.

The duration of ETT placement can be influenced by the type of surgery. The types of surgery in this study include laparotomy, laparoscopy, cholelithiasis, appendectomy, and urology. The researcher believes that the type of surgery affects the duration of the operation, leading to longer ETT placement in the throat, which triggers throat pain. Similar to previous research conducted by Susanti, (2017) where the study indicated that throat pain in respondents after endotracheal tube intubation dominated post-intubation. This may be due to the cuff pressure of the endotracheal tube, which is either too strong or high pressure-low volume, leading to ischemia in the tracheal mucosa area. The impact of a long duration of surgery significantly affects this cuff pressure.

In that study, the number of occurrences of throat pain due to endotracheal tube during surgeries lasting over 60 minutes included 8 respondents reporting throat pain after surgery. This condition is caused by prolonged pressure, ultimately disturbing blood flow around the tracheal mucosa area, resulting in post-operative throat pain (Florado et al., 2022). This is further supported by several

theories that throat pain due to intubation has various triggering factors, including the duration of the operation, age, and the intubation technique itself (Gemechu et al., 2017).

Based on the factor of gender, male patients who complained of throat pain were the most numerous, accounting for 36% (18/50). Among them, 9 patients (18%) reported mild pain, and 4 patients (8%) reported severe pain. In female respondents, the majority did not complain of throat pain, with 15 respondents (30%). According to the researcher, the likelihood of a higher incidence of throat pain in male patients is because the majority of them have a smoking habit, which was not found among female patients in this study.

This consistent with the research conducted by Millizia dan Maulina (2018), which indicated that throat pain after surgery with general anesthesia and ETT intubation was more common in male patients, accounting for 63.4% (26/41), while female respondents who experienced throat pain accounted for 36.6% (15/41). In the study by Fahriyani et al., (2017) it was also mentioned that throat pain was more frequent in males. Out of 28 male respondents, 6 individuals (21.4%) reported throat pain after intubation, whereas among the 60 female patients, 12 individuals (20.0%) complained of throat pain. In line with the research by Jaensson et al. (2014) in Millizia dan Maulina (2018) which stated that women are more at risk of complaining of throat pain after surgery with general anesthesia using ETT intubation, though there is no clear evidence for this.

The difference in laryngeal anatomy between men and women lies in the fact that in males, the larynx has a size of approximately 45 mm with a diameter of 35 mm, whereas in females, the larynx has a size of approximately 35 mm with a diameter of 25 mm. In females, the mucosal layer tends to be thinner, which makes them more prone to edema. According to the research by Millizia dan Maulina, (2018) this differs from the findings of susanti, (2017) where gender is one of the factors influencing throat pain after surgery with general anesthesia and ETT intubation. Women are more at risk of experiencing throat pain due to their narrower airways and thinner mucosal membranes.

Regarding the factor of smoking history, it is evident that patients who smoke complain of throat pain more frequently than non-smoking patients. Based on the smoking history, it can be observed that among non-smoking respondents, there were 16 individuals (32%) who did not experience throat pain. Among smoking respondents, 4 individuals (8%) did not report throat pain. Those who experienced throat pain included 17 smoking respondents (34%), consisting of 7 with mild pain (14%), 7 with moderate pain (14%), and 3 with severe pain (6%). Non-smoking respondents who experienced mild throat pain numbered 10 individuals (20%). In this study, the researcher believes that smoking can influence the level of throat pain.

This study is consistent with the research conducted by Elhakim et al, (2000) as mentioned in Fahriyani et al. (2017) where 26.0 % of smokers reported throat pain after intubation, while the incidence of throat pain after intubation in non-smoking respondents was 23.0%. The literature suggests that smoking respondents are more likely to complain of throat pain following ETT intubation due to the irritants in cigarettes, which can cause drying of the respiratory tract mucosa and a decrease in the integrity of respiratory tract cells, making them more susceptible to trauma. Smoking is considered a risk factor for postoperative airway complications (Irawan, 2019).

The incidence of throat pain in smoking respondents with general anesthesia and ETT intubation is six times greater than in non-smoking respondents. Smoking is pathologically related to squamous metaplasia of the respiratory epithelium and hyperplasia of mucous glands. Chronic smokers may experience inflammation, metaplasia, laryngeal epithelial dysplasia, which can damage the function and integrity of the larynx. Smoking can affect various organs, including the nervous system, heart, lungs, and the immune system. However, the respiratory system is most commonly affected during the perioperative phase (Millizia & Maulina, 2018).

The perioperative respiratory complications that can be modified result from increased vulnerability to upper respiratory tract reflux due to inhaling substances while

smoking. In this study, the researchers assume that smokers are more likely to experience throat pain in the postoperative period. This could be related to inflammation, metaplasia, or laryngeal epithelial dysplasia caused by chronic irritation from the components of cigarette smoke, which can damage laryngeal integrity and lead to the stimulation of respiratory tract receptors beneath the epithelium (Fahriyani et al. 2017).

Based on the size of the endotracheal tube (ETT), it was found that the highest number of respondents not experiencing throat pain was 11 individuals (22%) with a 6.5 mm ETT. In the case of the 7 mm ETT, the most common complaint was mild throat pain, with 11 individuals (22%) reporting it. On the other hand, among those with a 7.5 mm ETT, 3 individuals (6%) reported severe throat pain. According to Prama (2016), improperly sized ETT tubes can lead to post-intubation throat pain. In this study, 20 respondents (40%) did not report throat pain based on the size of the ETT. The researchers believe this is because the anesthetists accurately selected the ETT size according to the specific patient's intubation requirements. However, based on the results of this study, respondents intubated with a 7.5 mm ETT tube were more likely to experience post-intubation throat pain.

Another study conducted by Fahriyani et al., (2017) also found that respondents intubated with a 7.5 ETT tube were more likely to experience post-intubation throat pain. Their study reported that 40% of respondents intubated with a 7.5 ETT tube experienced post-intubation throat pain. Other literature indicates that using larger endotracheal tube sizes has a higher potential for throat pain, likely due to the increased contact area between the airway mucosa and the ETT tube. Improperly sized endotracheal tubes pose a high risk of damaging the tracheal mucosa in patients.

The research conducted by Darmawangsa, (2022) also pointed out that throat pain can occur depending on the size of the ETT used in patients who underwent surgery with general anesthesia and intubation techniques. According to the researcher, one of the potential causes of throat pain is the cuff of the endotracheal tube when it is inflated too

tightly, in addition to the size of the ETT used. This is consistent with the conducted by Darmawangsa, (2022) which suggested that the causes of throat pain, aside from the ETT size, include excessive inflation of the endotracheal cuff and the use of the LMA inserted too deeply, with the incidence of throat pain 24 hours after surgery being around 9%. Throat pain in respondents can be reduced if the cuff pressure of the endotracheal tube is kept at an ideal level. According to the researcher, the larger the size of the ETT used, the greater the likelihood of patients experiencing throat pain.

CONCLUSION

In this study, respondents undergoing surgery with general anesthesia using ETT reported post-intubation throat pain in 60% of cases. Out of this, 34% of patients experienced mild throat pain, 18% reported moderate pain, and 8% complained of severe throat pain.

Based on the age factor, it is evident that the highest number of individuals experiencing throat pain were around 35 years old, representing the majority of the sampled group. Regarding gender, male respondents reported the most instances of throat pain, with 18 individuals (36%) experiencing it.

The conclusion drawn by the researcher in this study is that throat pain, associated with a history of smoking, is more frequently observed in patients who smoke. Among the smoking patients, 13 individuals (26%) complained of throat pain, with 7 patients (14%) experiencing mild pain, 3 patients (6%) having moderate pain, and 3 patients (6%) encountering severe throat pain. On average, the research findings show that the occurrence of throat pain based on the duration of ETT intubation was approximately 71.60 minutes.

Based on the ETT tube size factor, throat pain is more frequently found in patients intubated with a 7.5 ID ETT tube, with 10 respondents complaining of throat pain, and among them, 4 individuals (8%) reported experiencing moderate pain.

From the results of this study, it is evident that the majority of patients only complained of mild throat pain, and a significant number did not report any throat

pain. Therefore, the endotracheal intubation anesthesia procedures at RSUD Dr. Soedirman Kebumen have successfully reduced post-intubation throat pain associated with endotracheal tubes.

RECOMMENDATION

For all hospitals, especially RSUD Dr. Soedirman Kebumen, the researcher hopes to provide clear and effective explanations or education in the event of post-operative throat pain. It is also expected that these measures can help reduce post-intubation throat pain associated with endotracheal tubes.

The researcher suggests that future studies can use this research as a source of information and reference, and they may consider expanding the research by adding other variables, such as the type of surgery, cuff pressure of the ETT, and the intubation provider.

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