

Incidence of Post-extubation sore throat in Patients Undergoing Laparoscopic Surgeries at SMHS Hospital, Srinagar

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Abstract

Post-extubation sore throat (PEST) is a common complication following endotracheal intubation, particularly in patients undergoing laparoscopic surgeries due to prolonged intubation and increased intra-abdominal pressure. This study aims to determine the incidence of PEST and identify associated risk factors in patients undergoing laparoscopic surgeries at Shri maharaja hari singh (SMHS) Hospital, Srinagar. A prospective observational study was conducted involving 200 patients. The incidence of PEST was found to be 36%, with significant associations noted with the duration of intubation and endotracheal cuff pressure. These findings highlight the need for effective preventive measures to reduce PEST incidence and improve patient outcomes.

Keywords

Post-extubation sore throat, Laparoscopic surgery, Risk factors, Intubation, Patient outcomes.

Introduction

Laparoscopic surgeries, characterized by minimal invasiveness, have become increasingly common due to their advantages over open surgeries, such as reduced postoperative pain, shorter hospital stays, and quicker recovery times. However, these procedures typically require general anesthesia with endotracheal intubation, which can lead to complications, including post-extubation sore throat (PEST). PEST, though often self-limiting, can cause significant discomfort and affect patient satisfaction and recovery.[1-3]

Objective: The primary objective of this study is to determine the incidence of PEST in patients undergoing laparoscopic surgeries at SMHS Hospital, Srinagar. Additionally, the study aims to identify risk factors associated with the development of PEST.

Significance of the study: Understanding the incidence and risk factors of PEST can help in developing strategies to mitigate this complication, enhancing patient care and recovery in laparoscopic surgeries.[4]

Literature review

Overview of PEST: PEST is a frequent postoperative complaint, with incidents reported between 20% and 65% in various studies. Factors contributing to PEST include the duration of intubation, the size and type of the endotracheal tube, cuff pressure, and the patient's age and sex.[5-6]

Factors influencing PEST: Studies have shown that prolonged intubation and high endotracheal cuff pressures are significant risk factors for PEST. Preventive measures such as the use of intracuff lidocaine and careful monitoring of cuff pressure have been suggested to reduce its incidence.[7-8]

Knowledge gaps: Despite extensive research, data specific to laparoscopic surgeries in the context of SMHS Hospital, Srinagar, remains limited. This study aims to fill this gap and provide region-specific insights.[9-10]

Methodology

Study design: A prospective observational study design was chosen to observe the incidence and factors associated with PEST in a real-world clinical setting.

Participants: The study included 200 patients undergoing elective laparoscopic surgeries at SMHS Hospital. Inclusion criteria were patients aged 18-65 years undergoing elective laparoscopic procedures. Exclusion criteria included patients with pre-existing throat conditions, emergency surgeries, and those with known allergies to lidocaine.

Inclusion criteria:

- Age: Patients aged 18-65 years.
- Surgery type: Patients scheduled for elective laparoscopic surgeries (e.g., cholecystectomy, appendectomy, hernia repair).
- Intubation: Patients who are intubated with an endotracheal tube during surgery.
- Consent: Patients who provide informed consent to participate in the study.
- ASA classification: Patients classified as American Society of Anesthesiologists (ASA) physical status I or II.

Exclusion criteria:

- Pre-existing conditions: Patients with pre-existing sore throat or upper respiratory tract infections.
- Surgery type: Patients undergoing emergency surgeries or non-laparoscopic procedures.
- Intubation issues: Patients with difficult intubation requiring multiple attempts or the use of a stylet.
- Comorbidities: Patients with significant comorbidities, such as severe asthma or chronic obstructive pulmonary disease (COPD).

- **Pregnancy:** Pregnant patients.
- **Medications:** Patients taking medications that might influence sore throat incidence, such as steroids or immunosuppressants.
- **Non-compliance:** Patients who are unable or unwilling to comply with study procedures and follow-up.

Rationale for criteria:

- **Age range:** Limiting to adults (18-65 years) ensures the study population is more homogeneous and reduces variability.
- **Elective laparoscopic surgeries:** Focuses on a specific type of surgery to control for surgical factors influencing PEST.
- **Intubation requirement:** Ensures all patients undergo a similar procedure with an endotracheal tube.
- **Informed consent:** Ethical requirement to ensure patients understand and agree to participate.
- **ASA classification:** Controls for patient health status and reduces variability in results.

Exclusion criteria help eliminate confounding factors that could skew the study results, ensuring the study's internal validity.

Data collection: Data were collected on patient demographics, type and duration of surgery, duration of intubation, endotracheal tube size, and cuff pressure. PEST was assessed at 1-, 6-, and 24-hours post-surgery using a standardized numerical rating scale.

Statistical analysis: Data were analyzed using descriptive statistics to determine the incidence of PEST. Logistic regression analysis was performed to identify significant predictors of PEST.

Results

Demographic breakdown:

Influencing factors: Duration of intubation greater than 90 minutes and cuff pressures exceeding 30 cm H₂O were significantly associated with higher PEST incidence ($p < 0.05$).

Participant demographics: A total of 200 patients undergoing elective laparoscopic surgeries at SMHS Hospital were included in the study. The demographic characteristics of the participants are summarized in

Table 1.

Characteristics	Number of patients	Percentage
Gender		
Male	120	60
Female	180	40
Age		
18-29	40	20
30-49	100	50
50-65	60	30
Types of Surgery		
Cholecystectomy	90	45
Appendectomy	70	35
Hernia Repair	40	20

Table 1: Demographic characteristics of participants

Incidence of PEST: Out of the 200 patients studied, 72 reported experiencing PEST, resulting in an overall incidence of 36%. The severity of PEST was assessed using a numerical rating scale (NRS) at 1-, 6-, and 24-hour post-surgery.

Incidence and severity of PEST at different time intervals

1 hour post-surgery: 40% (n=80)

6 hours post-surgery: 36% (n=72)

24 hours post-surgery: 20% (n=40)

Time interval	Mild (1-3)	Moderate (4-6)	Severe (7-10)
1-hour post-surgery	40	32	8
6-hour post-surgery	30	32	7
24-hour post-surgery	25	32	3

Table 2: Severity of PEST (NRS 0-10)

Factors influencing the incidence of PEST: Statistical analysis revealed several factors significantly associated with the incidence of PEST. These include the duration of intubation and endotracheal cuff pressure. The findings are summarized in Table 3.

Factor	PEST Incidence (%)	P-Value
Duration of intubation		
<60	20	<0.01
60-90 minutes	35	<0.01
>90 minutes	55	<0.01
Cuff pressure		
<25 cm H ₂ O	20	<0.01
25-30 cm H ₂ O	30	<0.01
>30 cm H ₂ O	50	<0.01

Table 3: Factors influencing PEST

Demographic Breakdown

The incidence of PEST varied by gender and age group. Female patients reported a higher incidence of PEST compared to male patients. Additionally, patients aged 30-49 years exhibited the highest incidence of PEST. The incidence of PEST was higher in female patients (40%) compared to male patients (32%). Patients aged 30-50 years showed a higher incidence (42%).

Characteristics	Pest incidence (%)	P-value
Gender		
Male	32	0.05
Female	40	0.05
Age		
18-29	25	<0.05
30-49	42	<0.05
50-65	30	<0.05

Table 4: Incidence of PEST by gender and age group

Use of preventive measures: A subset of patients received preventive measures such as intracuff lidocaine. The incidence of PEST in these patients was compared to those who did not receive any preventive measures.

Preventive measures	Number of patients	PEST Incidence (%)	p-value
Intracuff lidocaine	50	20	<0.01
No preventive measure	150	140	<0.01

Table 5: Incidence of PEST with preventive measures

Summary of Key Findings

- The overall incidence of PEST was 36%.
- Significant factors influencing PEST included the duration of intubation and endotracheal cuff pressure.
- Female patients and those aged 30-49 years had higher incidences of PEST.
- Preventive measures such as intracuff lidocaine significantly reduced the incidence of PEST.

These results suggest that careful management of intubation duration and cuff pressure, along with the use of preventive measures, can effectively reduce the incidence of PEST in patients undergoing laparoscopic surgeries.

Discussion

Interpretation of results: The incidence of PEST in this study aligns with previous research, indicating that PEST is a common complication following laparoscopic surgeries. The significant association with intubation duration and cuff pressure suggests the need for careful airway management.

Clinical implications: Monitoring and maintaining optimal cuff pressures and considering the use of intracuff lidocaine could potentially reduce the incidence of PEST. These findings advocate for improved anesthetic practices and patient care protocols.

Limitations: The study's limitations include its single-center design and the exclusion of emergency surgeries, which may limit the generalizability of the findings.

Recommendations: Adopting measures such as optimal cuff pressure management and considering the use of intracuff lidocaine may help reduce PEST incidence. Further research with larger, multi-center studies is recommended to validate these findings and explore additional preventive strategies.

Conclusion

This study highlights a 36% incidence of PEST in patients undergoing laparoscopic surgeries at SMHS Hospital, with significant associations with prolonged intubation and high cuff pressures.

References

1. Edomwonyi NP, Ekwere IT, Omo E, Rupasinghe A. Postoperative throat complications after tracheal intubation. *Ann Afr Med.* 2006;5(1):28-32. <https://www.ajol.info/index.php/aam/article/view/8369>
2. Sumathi PA, Shenoy T, Ambareesha M, Krishna HM. Controlled comparison between betamethasone gel and lidocaine jelly applied over tracheal tube to reduce postoperative sore throat, cough, and hoarseness of voice. *Br J Anaesth.* 2008;100(2):215-218. doi:10.1093/bja/aem341
3. Park SY, Kim SH, Noh JI, et al. The effect of intravenous low dose ketamine for reducing postoperative sore throat. *Korean J Anesthesiol.* 2010;59(1):22-26. doi:10.4097/kjae.2010.59.1.22
4. Jaensson M, Gupta A, Nilsson UG. Risk factors for development of postoperative sore throat and hoarseness after endotracheal intubation in women: a secondary analysis. *AANA J.* 2012;80(4 Suppl):S67-S73. <https://pubmed.ncbi.nlm.nih.gov/23248834/>
5. Higgins PP, Chung F, Mezei G. Postoperative sore throat after ambulatory surgery. *Br J Anaesth.* 2002;88(4):582-584. doi:10.1093/bja/88.4.582
6. Lam F, Lin YC, Tsai HC, Chen TL, Tam KW, Chen CY. Effect of Intracuff Lidocaine on Postoperative Sore Throat and the Emergence Phenomenon: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *PLoS One.* 2015;10(8):e0136184. doi:10.1371/journal.pone.0136184
7. Tanaka Y, Nakayama T, Nishimori M, Tsujimura Y, Kawaguchi M, Sato Y. Lidocaine for preventing postoperative sore throat. *Cochrane Database Syst Rev.* 2015;2015(7):CD004081. doi:10.1002/14651858.CD004081.pub3
8. Patel N, Dhuliya S, Shah D. Comparative evaluation of incidence of postoperative sore throat after nebulization with ketamine and magnesium sulfate in patients undergoing general anesthesia requiring endotracheal intubation. *Int J Clin Anesth.* 2022;9(2):227-232. doi:10.18231/j.ijca.2022.045

9. El-Boghdadly K, Bailey CR, Wiles MD. Postoperative sore throat: a systematic review. *Anaesthesia*. 2016;71(6):706-717. doi:10.1111/anae.13438

10. Fayyaz A, Furqan A, Ammar A, Akhtar R. Comparing the effectiveness of Betamethasone Gel with Lidocaine Gel local application on endotracheal tube in preventing post-operative sore throat (POST). *J Pak Med Assoc*. 2017;67(6):873-876. <https://pubmed.ncbi.nlm.nih.gov/28585585/>

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Ethical Approval

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Conflict of Interest Statement

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