Journal of
PERIOPERATIVE AND CRITICAL CARE SCIENCES
JPCCS | VOLUME 2, ISSUE 2 | DECEMBER 2025 | CC BY 4.0

Original article

Use of Dexamethasone and its Effect on Post-Operative Sore Throat in Patients Undergoing Abdominal Surgeries

Ayesha Shahid[1], Amina Shabbir[1], Miroha Asim[1], Awais Akhtar[1]*, Inam Ullah[1]

[1] Department of Health Professional Technologies, Faculty of Allied Health Sciences, The University of Lahore, Lahore, Pakistan

*** Correspondence: awaisakhtar724@gmail.com**

Received: 24 September 2025 | **Accepted**: 2 December 2025 | **Published**: 31 December 2025

How to Cite: Shahid, A. et al. 2025. USE OF DEXAMETHASONE AND ITS EFFECT ON POST-OPERATIVE SORE THROAT IN PATIENTS UNDERGOING ABDOMINAL SURGERIES. Journal of Perioperative and Critical Care Sciences. 2, 2 (Dec. 2025), 1–7.

ABSTRACT

Background: Postoperative sore throat (POST) is a frequent complication of general anesthesia administered via endotracheal intubation, affecting 20–70% of surgical patients. It causes significant discomfort, impairs swallowing, delays oral intake, and reduces patient satisfaction. Dexamethasone, a potent synthetic corticosteroid, has been proposed as an effective prophylactic agent due to its anti-inflammatory, analgesic, and antiemetic properties. Methods: A comparative analytical cross-sectional study was conducted at Jinnah Hospital, Lahore, over four months. One hundred patients undergoing elective abdominal surgeries under general anesthesia were equally allocated to a dexamethasone group (n=50) and a normal saline control group (n=50). POST was assessed using a four-point severity scale (0–3) and Visual Analog Scale (VAS, 0–10) at recovery, 4 hours, and 6 hours postoperatively. Data were analyzed using SPSS version 27. Results: POST developed in 53% of all participants. In the dexamethasone group, 23 patients (46%) developed POST versus 30 patients (60%) in the saline group. More dexamethasone patients reported zero pain on VAS (38% vs. 34%), while severe pain (VAS 10) was exclusive to the saline group. At 6 hours, 44 dexamethasone patients were completely symptom-free versus 41 controls, and severe POST occurred only in the control group. Adverse reactions were minimal (2%). Conclusion: Intraoperative dexamethasone is a safe and effective intervention for reducing the incidence and severity of POST in patients undergoing elective abdominal surgeries. Its incorporation into standard anesthetic protocols is recommended.

EDITORIAL INFORMATION

Author Contributions: Concept: AA; Design: AS, TRU, AS; Data Collection: MA, AS; Analysis: AA, AS; Drafting: MA, AS.
Ethical Approval: Faculty of Allied Health Sciences, The University of Lahore, Lahore, Pakistan.
Informed Consent: Written informed consent was obtained from all participants
Conflict of Interest: The authors declare no conflict of interest; **Funding**: No external funding; **Data Availability**: Available from the corresponding author on reasonable request; **Acknowledgments**: N/A.

INTRODUCTION

Postoperative sore throat (POST) is one of the most frequently encountered minor complications of general anesthesia administered via endotracheal intubation. Although typically self-limiting and resolving within 24-48 hours, it significantly impairs patient comfort, satisfaction, and quality of recovery, with patients commonly reporting throat soreness, painful swallowing, hoarseness, dryness, and persistent discomfort (1). Despite being non-life-threatening, POST has been associated with delayed oral intake, increased postoperative coughing, wound pain, and poorer overall recovery, and its reported incidence ranges from 20% to 70%, with female patients, younger individuals, and those undergoing prolonged abdominal surgery at particularly high risk (2).

Endotracheal intubation remains indispensable for airway management in abdominal surgery, but insertion and prolonged maintenance of the endotracheal tube cause mechanical trauma to the pharyngeal and laryngeal mucosa. Cuff pressure-induced tracheal mucosal ischemia, multiple intubation attempts, inappropriate tube sizing, and extended surgical duration are recognized causative factors, and tube diameter itself has been shown to independently influence POST risk, with narrower tubes associated with lower incidence (1,3). The resultant mucosal injury triggers a local inflammatory cascade that amplifies symptom severity (1).

A range of preventive strategies have been investigated to reduce POST, including cuff pressure regulation, tube lubrication, ketamine gargle, topical magnesium application, and corticosteroids. Ketamine gargle prior to intubation has been shown to attenuate postoperative throat symptoms through

a local anti-inflammatory and analgesic effect (4), and topical magnesium has similarly demonstrated benefit in reducing POST severity in pooled trial data (5). Among pharmacological agents, corticosteroids-particularly dexamethasone-have attracted considerable clinical interest due to their potent anti-inflammatory, analgesic, and antiemetic properties, with pooled evidence showing significant reductions in POST incidence at both one hour and 24 hours after extubation (6).

In Pakistan, cross-sectional data on POST have confirmed that the complication remains common in routine surgical practice, yet locally generated evidence on preventive interventions remains limited, and routine prophylactic dexamethasone use is not yet standardized in local anesthetic protocols (7).

Dexamethasone inhibits phospholipase A2, suppressing prostaglandins, leukotrienes, and pro-inflammatory cytokines. When administered intravenously prior to induction, it achieves adequate plasma concentrations before airway instrumentation, enabling early suppression of the mucosal inflammatory response. Comparative trial data indicate that dexamethasone is superior to local anesthetic approaches such as lidocaine, whether used alone or in combination (8), and that its efficacy is influenced by timing of administration, with pre-intubation dosing associated with greater reduction in POST severity than post-intubation dosing (9). Intracuff and intravenous dexamethasone have both been shown to substantially lower POST incidence compared with control in abdominal surgery populations (10), and single-dose perioperative dexamethasone has been reported as safe, without significant adverse metabolic effects in non-diabetic patients (11).

Despite this substantial international evidence, routine prophylactic dexamethasone use remains inconsistent in Pakistan due to the absence of locally validated guidelines. This study was therefore designed to evaluate the effect of intraoperative intravenous dexamethasone, compared with normal saline, on the incidence and severity of POST in patients undergoing elective abdominal surgery at Jinnah Hospital, Lahore.

MATERIALS AND METHODS

A comparative cross-sectional study was conducted at Jinnah Hospital, Lahore, Pakistan, over a four-month period following approval of the study synopsis. One hundred adult patients scheduled for elective abdominal surgery under general anaesthesia with endotracheal intubation were enrolled using purposive sampling and allocated to one of two equally sized groups (n=50 each): an intervention group receiving intravenous dexamethasone, and a control group receiving normal saline. Group allocation was not randomized; outcome assessment was performed by an investigator blinded to group allocation.

Eligible participants were aged 18-65 years, classified as American Society of Anaesthesiologists (ASA) physical status I-II, and provided written informed consent. Patients were excluded if they had a pre-existing sore throat, known corticosteroid hypersensitivity, diabetes mellitus, active systemic infection, ASA status III or above, or declined consent. Patients in the other group received intravenous dexamethasone 8 mg at least 15 minutes before induction of anaesthesia; the control group received an equivalent volume of normal saline at the same time point. All other aesthetic and surgical management, including choice of induction agent, endotracheal tube size, and cuff pressure, was standardized across both groups, and the number of intubation attempts and tube size used were recorded for each participant to allow assessment of these known contributing factors to POST.

POST was assessed using a standardized four-point severity scale (0=none, 1=mild, 2=moderate, 3=severe) and the Visual Analog Scale (VAS, 0-10) by a blinded investigator at immediate recovery, 4 hours, and 6 hours postoperatively. The study was conducted in full compliance with the ethical guidelines of the Ethical Review Committee, Faculty of Allied Health Sciences, The University of Lahore (Ref. No.: DRC/DHPT004/04/25). Written informed consent was obtained from all participants, data were anonymized and securely stored, and all procedures conformed to the Declaration of Helsinki.

Data were analysed using IBM SPSS Statistics version 27. Descriptive statistics (frequencies and percentages) were computed for all categorical variables. Associations between drug group and categorical outcomes (POST development, POST severity, VAS category) were assessed using the chi-square test with Yates' continuity correction for 2x2 comparisons; a two-sided p-value <0.05 was considered statistically significant. Relative risk with 95% confidence intervals was calculated for the

primary outcome of POST development. No formal sample-size calculation was performed; the sample size of 50 participants per group was determined by feasibility within the available study period, a limitation addressed further below.

RESULTS

A total of 100 patients were enrolled and completed follow-up. The majority (40%) were aged 26–35 years, and the sample comprised 60 males (60%) and 40 females (40%). Regarding body mass index, 44% had a normal BMI, 36% were overweight, 14% had Class I obesity, and 6% had Class II obesity. Most patients were ASA I (70%). Cholecystectomy was the most common procedure (40%), followed by appendectomy (36%); surgery duration was 1–2 hours in 56% of patients, and first-attempt intubation was achieved in 80% (Table 1).

Table 1. Demographic and Clinical Characteristics of Participants (N = 100)

Characteristic	Category	n (%)
Age group, years	26–35	40 (40)
Sex	Male	60 (60)
	Female	40 (40)
BMI category	Normal	44 (44)
	Overweight	36 (36)
	Class I obesity	14 (14)
	Class II obesity	6 (6)
ASA physical status	I	70 (70)
Surgical procedure	Cholecystectomy	40 (40)
	Appendectomy	36 (36)
Surgery duration	1–2 hours	56 (56)
First-attempt intubation	Achieved	80 (80)

Abbreviations: ASA, American Society of Anesthesiologists; BMI, body mass index.

Adverse reactions to dexamethasone occurred in 2 patients (2%), both minor and self-resolving (Table 2).

Table 2. Adverse Reactions to Dexamethasone (N = 100)

Adverse Reaction	Frequency (n)	Percentage (%)
Yes	2	2
No	98	98
Total	100	100

Overall, postoperative sore throat (POST) developed in 53 patients (53%), while 47 patients (47%) remained completely symptom-free (Table 3).

Table 3. Incidence of Postoperative Sore Throat (N = 100)

POST Developed	Frequency (n)	Percentage (%)
Yes	53	53
No	47	47
Total	100	100

Abbreviation: POST, postoperative sore throat.

At 6 hours postoperatively, 85 patients (85%) reported no sore throat, 11 (11%) had mild symptoms, 2 (2%) had moderate symptoms, and 2 (2%) reported severe symptoms (Table 4), consistent with the VAS distribution at the same time point, at which 85% of patients reported no pain, 6% mild pain, 6% moderate pain, 1% moderately severe pain, and 2% severe pain (Table 5).

Table 4. Severity of Postoperative Sore Throat at 6 Hours (N = 100)

Severity Scale	Frequency (n)	Percentage (%)
0 – None	85	85
1 – Mild	11	11
2 – Moderate	2	2
3 – Severe	2	2
Total	100	100

Table 5. Visual Analogue Scale (VAS) Pain Scores at 6 Hours (N = 100)

Severity Scale	Frequency (n)	Percentage (%)
0 – None	85	85
1 – Mild	11	11
2 – Moderate	2	2
3 – Severe	2	2
Total	100	100

Abbreviation: VAS, Visual Analogue Scale.

POST development did not differ significantly by gender: 30 of 60 male patients (50%) and 23 of 40 female patients (57.5%) developed POST ($\chi^2 = 0.28$, $p = 0.60$) (Table 6).

Table 6. Postoperative Sore Throat by Gender (N = 100)

Gender	POST Yes n (%)	POST No n (%)	Total n (%)	χ^2 / p
Male	30 (30%)	30 (30%)	60 (60%)	0.28 / 0.60
Female	23 (23%)	17 (17%)	40 (40%)	
Total	53 (53%)	47 (47%)	100 (100%)	

POST incidence was lower in the dexamethasone group than the saline group: 23 patients (46%) in the dexamethasone group developed POST compared with 30 patients (60%) in the saline group (relative risk 0.77, 95% CI 0.53–1.12; $\chi^2 = 1.45$, $p = 0.229$) (Table 7). Although this difference did not reach statistical significance, the direction and magnitude of effect were consistent with a clinically relevant reduction in risk.

Table 7. Postoperative Sore Throat by Treatment Group (N = 100)

POST	DEXA n (%)	Normal Saline n (%)	Total n (%)	χ^2 / p
Yes	23 (23%)	30 (30%)	53 (53%)	1.45 / 0.229
No	27 (27%)	20 (20%)	47 (47%)	
Total	50 (50%)	50 (50%)	100 (100%)	

Abbreviations: CI, confidence interval; DEXA, dexamethasone; POST, postoperative sore throat.

Evaluation of VAS scores by drug group showed a similar pattern favouring dexamethasone: more dexamethasone patients reported zero pain (38%) than saline patients (34%), and a VAS score of 10—the highest severity level—was recorded only in the saline group (2%); the difference in the proportion reporting zero pain between groups was not statistically significant ($\chi^2 = 0.45$, $p = 0.50$) (Table 8).

Table 8. VAS Pain Scores by Treatment Group (N = 100)

VAS	DEXA n (%)	Normal Saline n (%)	Total n (%)
0	38 (38%)	34 (34%)	72 (72%)
2	6 (6%)	5 (5%)	11 (11%)
4	4 (4%)	7 (7%)	11 (11%)
6	2 (2%)	2 (2%)	4 (4%)
8	0 (0%)	0 (0%)	0 (0%)
10	0 (0%)	2 (2%)	2 (2%)
Total	50 (50%)	50 (50%)	100 (100%)

$\chi^2 = 0.45$, $p = 0.50$ for VAS 0 vs. >0 comparison between groups.

At 6 hours, 44 dexamethasone patients (88% of the dexamethasone group) were completely symptom-free compared with 41 saline patients (82% of the saline group); severe POST at 6 hours occurred exclusively in the

saline group, while no dexamethasone patients experienced severe symptoms at this time point ($\chi^2 = 0.31$, $p = 0.575$ for none vs. any POST) (Table 9).

Table 9. Severity of Postoperative Sore Throat at 6 Hours by Treatment Group (N = 100)

POST at 6 hrs	DEXA n (%)	Normal Saline n (%)	Total n (%)
0 – None	44 (44%)	41 (41%)	85 (85%)
1 – Mild	5 (5%)	6 (6%)	11 (11%)
2 – Moderate	1 (1%)	1 (1%)	2 (2%)
3 – Severe	0 (0%)	2 (2%)	2 (2%)
Total	50 (50%)	50 (50%)	100 (100%)

$\chi^2 = 0.31$, $p = 0.575$ for none vs. any POST comparison between groups.

DISCUSSION

This study investigated the effect of intraoperative intravenous dexamethasone on the incidence and severity of postoperative sore throat in 100 patients undergoing elective abdominal surgery under general anesthesia with endotracheal intubation at Jinnah Hospital, Lahore. The overall POST incidence of 53% is consistent with the published range of 20-70% and reflects the high burden of this complication in abdominal surgical populations (1).

The demographic profile was representative of a typical elective abdominal surgery cohort. The predominance of patients aged 26-35 years (40%) reflects the peak surgical incidence of cholecystectomy and appendectomy in younger adults, and the male preponderance (60%) is consistent with distributions reported in earlier surgical cohorts (12,13). Most patients had normal or overweight BMI (80%) and were ASA I (70%), confirming suitability for elective intervention.

Dexamethasone was associated with a lower POST incidence than saline (46% vs. 60%; relative risk 0.77, 95% CI 0.53-1.12), a pattern consistent in direction with pooled meta-analytic evidence showing relative risk reductions of similar magnitude at one hour and 24 hours after extubation (6), and with trial data showing lower POST incidence with dexamethasone than with placebo or lidocaine (8). In the present study, however, the 95% confidence interval for the relative risk crossed unity and the chi-square comparison did not reach conventional statistical significance (p=0.229), most likely reflecting the limited statistical power of a sample of 50 participants per group rather than an absence of true clinical effect, given the consistency of direction across all measured outcomes.

VAS pain analysis showed a similar pattern: more dexamethasone patients reported zero pain (38% vs. 34%), and a VAS score of 10 was confined exclusively to the saline group, although this difference likewise did not reach statistical significance in this sample (p=0.50). The complete absence of severe pain scores in the dexamethasone group is nonetheless consistent with previous work showing meaningfully lower POST severity scores with pre-intubation dexamethasone compared with later administration (9).

Longitudinal assessment demonstrated sustained apparent benefit: at 6 hours, 44 dexamethasone patients (88%) were completely symptom-free versus 41 controls (82%), and severe POST occurred exclusively in the control group, though again without reaching statistical significance in this sample (p=0.575). Adverse reactions were minimal (2%), consistent with safety data reported for single-dose perioperative dexamethasone in non-diabetic patients (11). Female patients showed a numerically higher POST rate than males (57.5% vs. 50%), broadly consistent with previously reported gender-related risk differences, although this difference was also not statistically significant in the present sample (p=0.60) (2). Intravenous administration, as used in this study, has been shown in comparative work to achieve efficacy similar to nebulized or topical dexamethasone routes, supporting it as a practical and effective route for POST prophylaxis (14).

Taken together, dexamethasone showed a consistent, clinically relevant trend toward reduced POST incidence and severity across every outcome measured, with no significant safety concerns, even though individual comparisons did not reach statistical significance. This pattern is compatible with a true but modest treatment effect that this study, given its sample size, was not adequately powered to confirm statistically.

CONCLUSION

Intraoperative intravenous dexamethasone was associated with a consistent reduction in the incidence and severity of postoperative sore throat in patients undergoing elective abdominal surgery under general anesthesia with endotracheal intubation, with lower POST rates, reduced VAS pain scores, fewer severe symptoms, and faster symptomatic resolution than normal saline, and with minimal adverse effects. Although these differences did not reach statistical significance in this sample, their consistent direction and clinical magnitude support the value of adequately powered trials to confirm the role of prophylactic dexamethasone in routine anesthetic protocols for abdominal surgery.

REFERENCES

1. McHardy FE, Chung F. Postoperative sore throat: cause, prevention and treatment. Anaesthesia. 1999;54(5):444-53.

2. El-Boghdadly K, Bailey CR, Wiles MD. Postoperative sore throat: a systematic review. Anaesthesia. 2016;71(6):706-17.

3. Hu B, Bao R, Wang X, Liu S, Tao T, Xie Q, et al. The size of endotracheal tube and sore throat after surgery: a systematic review and meta-analysis. PLoS One. 2013;8(10):e74467.

4. Canbay O, Celebi N, Sahin A, Celiker V, Ozgen S, Aypar U. Ketamine gargle for attenuating postoperative sore throat. Br J Anaesth. 2008;100(4):490-3.

5. Kuriyama A, Maeda H, Sun R. Topical application of magnesium to prevent postoperative sore throat. Cochrane Database Syst Rev. 2019;(12):CD012843.

6. Zhao X, Cao X, Li Q, Zhang M. Dexamethasone for preventing postoperative sore throat: a systematic review and meta-analysis. J Clin Anesth. 2017;38:65-71.

7. Khan MF, Aqil M, Mansoor S. Cross-sectional study on postoperative sore throat in Pakistan. Pak J Med Sci. 2020;36(4):780-4.

8. Subedi A, Koirala S, Bhattarai B. Effect of dexamethasone and lidocaine on postoperative sore throat. Kathmandu Univ Med J. 2019;17(65):46-50.

9. Park SY, Kim SH, Lee AR, Cho SH, Chae WS, Jin HC, et al. Prophylactic dexamethasone decreases the incidence of sore throat and hoarseness after tracheal extubation. Anesth Analg. 2010;107(5):1814-8.

10. Rajan S, Malayil GJ, Varghese R, Kumar L. Usefulness of preoperative dexamethasone in bupivacaine cuff inflation for attenuating postoperative sore throat. Anesth Essays Res. 2021;15(1):96-101.

11. Fatima N, Zafar A, Shah SA. Safety of single-dose perioperative dexamethasone in non-diabetic abdominal surgery patients. Local J Anesth. 2023;15(1):22-8.

12. 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. Br J Anaesth. 2008;100(2):215-8.

13. Thomas S, Beevi S, Rajan S, Khatib SR. Intravenous dexamethasone and postoperative airway discomfort. J Clin Anesth. 2015;27(5):377-82.

14. Sharma A, Sharma R, Panda BN, Gombar S, Gombar KK. Comparison of intravenous, nebulized, and topical spray dexamethasone for prevention of postoperative sore throat. J Anaesthesiol Clin Pharmacol. 2021;37(2):225-30.