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ORIGINAL ARTICLE

The Effect of Single Dose Dexamethasone on Postoperative Pain after Tonsillectomy

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ABSTRACT

Introduction: *Tonsillectomy is a frequently performed ENT surgery, which is mostly done for recurrent tonsillitis or obstructive tonsillar hypertrophy. This study aimed to investigate the influence of a single dose of dexamethasone on postoperative pain intensity.* ***Methods & Materials:*** *This was a prospective randomised controlled study conducted in the Department of Anaesthesiology at Faridpur General Hospital, during the period from January 2025 to December 2025. A total of 100 patients scheduled for tonsillectomy surgery due to recurrent tonsillitis or tonsillar hypertrophy were included in the study. Data were analysed using the computer software SPSS version 26.0.* ***Result:*** *Dexamethasone brought down third, day post, surgery pain by nearly a half scale on the VAS scale (4.8 vs 6.2 at 6 h; 2.0 vs 3.1 on day 5, p < 0.001), and helped reduce the need for rescue analgesia by more than half (36% vs 68%, p = 0.002). Dexamethasone also helped patients return to normal oral intake sooner (60% vs 32% within 6 h, p = 0.01). There were fewer cases of postoperative nausea and vomiting (12% vs 36%), and the overall rate of complications was lower (14% vs 40%, p = 0.01) despite the groups being matched for age, gender, and haemorrhage rates.* ***Conclusion:*** *The trial revealed that a single dose of dexamethasone during surgery greatly improved post-tonsillectomy recovery. Patients who received dexamethasone had less pain at all times, used fewer pain medications (36% vs 68%), started oral intake earlier (60% vs 32% in 6 hours), had less nausea and vomiting (12% vs 36%), and had no significant difference in postoperative bleeding (2% vs 4%).*

Keywords: *Dexamethasone, Tonsillectomy, Postoperative Pain*

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INTRODUCTION

Tonsillectomy ranks very high among surgical operations performed by otolaryngologists on children as well as adults. Postoperative pain continues to be a major clinical problem, although there have been remarkable developments in surgical techniques and perioperative care. Tonsillectomy pain is very intense most times and lasts for several days. It not only causes pain on swallowing but also reduces oral intake, leading to dehydration, poor sleeping, delayed recovery, and increased healthcare visits. Therefore, proper control of post-tonsillectomy pain is very necessary for patient comfort, early resumption of normal diet and activities, and prevention of postoperative complications [1]. The post-tonsillectomy pain is mainly inflammatory since it is caused by tissue trauma, muscle spasm, and exposure of the tonsillar fossa. Conventional analgesic regimens are mainly composed of paracetamol, non, steroidal anti, inflammatory drugs (NSAIDs), and opioids. However, opioids have been known to lead to various side effects such as respiratory depression, sedation, nausea, and vomiting, whereas NSAIDs may predispose some patients to postoperative bleeding. Because of these drawbacks, the search for adjunctive therapies that can suppress the inflammatory cascade and thus help decrease the use of systemic analgesics has been carried out.[2] Dexamethasone is a long-acting synthetic corticosteroid that has been extensively investigated as a perioperative adjunct due to its strong anti-inflammatory and anti-edematous effects. Its mechanism includes inhibition of phospholipase A2 and a decrease in production of inflammatory mediators such as prostaglandins, leukotrienes, and cytokines. By limiting tissue inflammation and edema at the surgical site, dexamethasone is likely to be effective in pain reduction and functional recovery after tonsillectomy [3]. Many randomized controlled trials and systematic reviews have examined the effectiveness of a single perioperative dose of dexamethasone in tonsillectomy patients. The data indicate that a single intravenous dose given before or during surgery can greatly reduce the early postoperative pain scores when compared to placebo or standard care [4]. Furthermore, dexamethasone was found to reduce postoperative nausea and vomiting, increase patient comfort, and help patients start oral intake earlier, thus supporting faster recovery [5]. Meta-analyses from the last ten years have found that perioperative dexamethasone results in slight but clinically significant reductions in pain severity during the first 24 hours post-surgery, together with lower analgesic needs [6]. The perks were quite similar for kids and adults, as studies in both groups

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came to the same kind of agreement about a single intraoperative dose as part of multimodal analgesia protocols [7]. On top of that, the safety profile of a single dose of dexamethasone is quite good, with most studies showing no significant increase in postoperative hemorrhage or infection [8]. Yet, even with these positive pieces of evidence, there are still some discrepancies in the literature regarding the ideal dose, administration time, and duration of analgesic effects. Some studies prove a dramatic decrease in the level of pain only during the first hours of the postoperative period, whereas others show the same level of pain relief even after several days [9].

METHODS & MATERIALS

This study is a prospective, randomized controlled trial that has been carried out in the Department of Anaesthesiology at Faridpur General Hospital, Faridpur, Bangladesh over the period of January 2025 to December 2025. Informed written consent was obtained from the 100 patients who were scheduled for elective tonsillectomy for recurrent tonsillitis or tonsillar hypertrophy and thus included in the study. Patients between the ages of 5-40 years, both genders, and classified as American Society of Anesthesiologists (ASA) physical status I or II were considered for the study. Those with a history of allergy to steroids, bleeding disorders, systemic illnesses (like diabetes or immunosuppression), recent steroid therapy, peritonsillar abscess, or combined surgical procedures were excluded. Using a simple randomization procedure, the study subjects were allocated into two groups of 50 each (n = 50) equally and randomly. Immediately after induction of anaesthesia, Group D (study group) received a single intravenous dose of dexamethasone (0.15 mg/kg, maximum 8 mg), and Group C (control group) received an equivalent volume of normal saline. All patients had tonsillectomy under general anaesthesia with the same standardized surgical method, as surgeons with great experience performed the operations. The Visual Analog Scale (VAS) was used to measure the severity of the postoperative pain at 6 hours, 12 hours, 24 hours, postoperative day 3, and day 5. The authors also recorded the number of times rescue analgesia was used within the first 24 hours after surgery. Data were obtained through a structured data sheet and processed with SPSS version 26.0 software. Continuous variables were presented as mean, standard deviation, and categorical variables as frequency and percentage. The chi-square test was used for intergroup comparison where it was appropriate. A p-value of <0.05 was regarded as statistically significant.

RESULTS

Among the study patients, 27 (27%) were aged ≤10 years, 35 (35%) were 11–20 years, 22 (22%) were 21–30 years, and 16 (16%) were older than 30 years. In Group D, the distribution was 14, 18, 10, and 8 patients respectively, while in Group C it was 13, 17, 12, and 8 patients. The age distribution between the two groups was comparable, and the difference was not statistically significant (p = 0.93) *Table I*.

Table – 1: Age distribution of the study patients (*n* = 100)

Age group (years)	Group D (n=50)	Group C (n=50)	Total (%)	p value
≤10	14	13	27 (27%)	0.93
11–20	18	17	35 (35%)	
21–30	10	12	22 (22%)	
>30	8	8	16 (16%)	

Out of 100 patients, 54 (54%) were male, and 46 (46%) were female. Group D included 28 males and 22 females, whereas Group C included 26 males and 24 females. The gender distribution between the two groups was similar and statistically not significant (p = 0.68) *Table II*.

Table – II: Gender distribution of the study patients (*n* = 100)

Gender	Group D (n=50)	Group C (n=50)	Total (%)	p value
Male	28	26	54 (54%)	0.68
Female	22	24	46 (46%)	

The mean VAS pain score at 6 hours was 4.8 ± 1.1 in Group D compared to 6.2 ± 1.3 in Group C. At 12 hours, the scores were 4.2 ± 1.0 and 5.8 ± 1.2, respectively. At 24 hours, the mean pain score was 3.6 ± 0.9 in the dexamethasone group and 5.1 ± 1.1 in the control group. On postoperative day 3, the scores decreased to 2.8 ± 0.8 and 4.2 ± 1.0, and by day 5, they were 2.0 ± 0.7 and 3.1 ± 0.9, respectively. Pain scores were significantly lower in Group D at all time intervals (p < 0.001) *Table III*.

Table – III: Mean postoperative pain score (VAS) at different time intervals (*n* = 100)

Time after surgery	Group D (Mean ± SD)	Group C (Mean ± SD)	p value
6 hours	4.8 ± 1.1	6.2 ± 1.3	<0.001
12 hours	4.2 ± 1.0	5.8 ± 1.2	<0.001
24 hours	3.6 ± 0.9	5.1 ± 1.1	<0.001
Day 3	2.8 ± 0.8	4.2 ± 1.0	<0.001
Day 5	2.0 ± 0.7	3.1 ± 0.9	<0.001

In the dexamethasone group, 18 patients (36%) required rescue analgesia within the first 24 hours, while 32 patients (64%) did not require additional analgesics. In contrast, 34 patients (68%) in the control group required rescue analgesia, and only 16 patients (32%) did not. The difference between the two groups was statistically significant (p = 0.002) *Table IV*.

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Table – IV: Requirement of rescue analgesia within first 24 hours (*n* = 100)

Rescue analgesia	Group D (n=50)	Group C (n=50)	p value
Required	18 (36%)	34 (68%)	0.002
Not required	32 (64%)	16 (32%)	

In Group D, 30 patients (60%) resumed oral intake within 6 hours, 15 patients (30%) between 6 and 12 hours, and 5 patients (10%) after 12 hours. In Group C, 16 patients (32%) resumed oral intake within 6 hours, 22 patients (44%) between 6 and 12 hours, and 12 patients (24%) after 12 hours. Early oral intake was significantly more common in the dexamethasone group (p = 0.01) *Table V*.

Table – V: Time to first oral intake after surgery (*n* = 100)

Time to oral intake	Group D (n=50)	Group C (n=50)	p value
≤6 hours	30 (60%)	16 (32%)	0.01
6–12 hours	15 (30%)	22 (44%)	
>12 hours	5 (10%)	12 (24%)	

Postoperative nausea and vomiting occurred in 6 patients (12%) in Group D compared to 18 patients (36%) in Group C. Secondary hemorrhage was observed in 1 patient (2%) in the dexamethasone group and 2 patients (4%) in the control group. No complications were reported in 43 patients (86%) in Group D and 30 patients (60%) in Group C. The overall complication rate was significantly lower in the dexamethasone group (p = 0.01) *Table VI*.

Table – VI: Postoperative complications (*n* = 100)

Complication	Group D (n=50)	Group C (n=50)	p value
Nausea/Vomiting	6 (12%)	18 (36%)	0.01
Secondary bleeding	1 (2%)	2 (4%)	
No complication	43 (86%)	30 (60%)	

DISCUSSION

This study showed that the majority of patients were in the 11–20 years age group (35%), followed by ≤10 years (27%), 21–30 years (22%), and >30 years (16%), with comparable distribution between Group D and Group C (p = 0.93). This balanced demographic profile is important for outcome comparison. Similarly, Buland et al. reported a comparable age distribution between the dexamethasone and control groups with mean ages of 13.2 ± 4.6 years and 12.8 ± 5.1 years, respectively, without a significant intergroup difference [7]. This present study revealed that 54% of patients were male and 46% were female, with similar proportions in Group D (28 males, 22 females) and Group C (26 males, 24 females) (p = 0.68). Comparable gender balance was reported by Czarnetzki et al., where the male-to-female ratio did not differ significantly between groups [4]. Similarly, Afman et al. in their meta-analysis observed no gender-related influence on the analgesic effect of dexamethasone [5]. Therefore, gender was unlikely to confound the outcomes in the present study. The study also demonstrated significantly lower VAS scores in the dexamethasone group at all time points: 6 h (4.8 vs 6.2), 12 h (4.2 vs 5.8), 24 h (3.6 vs 5.1), day 3 (2.8 vs 4.2), and day 5 (2.0 vs 3.1) (p < 0.001). Malhotra et al. similarly reported significantly lower mean pain scores on postoperative days 1, 3, and 5 in patients receiving a single preoperative dose of dexamethasone (p < 0.01) [9]. A systematic review by Waldron et al. also confirmed that perioperative dexamethasone significantly reduced early postoperative pain intensity and analgesic requirement [3]. In this study, only 36% of patients in the dexamethasone group required additional analgesia compared to 68% in the control group (p = 0.002). Similar findings were reported by Buland et al., where the dexamethasone group required significantly fewer supplemental analgesic doses than the control group (p < 0.05) [7]. De Oliveira et al. also reported reduced postoperative opioid consumption following a single perioperative dose of dexamethasone in their meta-analysis [6]. The study indicated that 60% of patients in Group D resumed oral intake within 6 hours compared to 32% in Group C (p = 0.01). Nil Kaan et al. reported significantly earlier tolerance to oral fluids in the dexamethasone group (mean 4.6 h vs 8.7 h in controls, p < 0.05) [10]. Early oral intake is vital from a clinical point of view as it reduces the risk of dehydration and leads to faster recovery, probably through decreased pain and nausea. In this study, the dexamethasone group had significantly fewer incidences of nausea and vomiting (12% vs 36%), while postoperative bleeding rates were low and similar (2% vs 4%) (p = 0.01). Czarnetzki et al. observed a significant decrease in postoperative nausea and vomiting after dexamethasone treatment (p < 0.001) with no clinically significant increase in hemorrhage at the normal dose [4]. Plante et al. also came to the same conclusion that a single dose of dexamethasone does not significantly increase the risk of post, tonsillectomy bleeding [8]. A different clinical study consisting of 123 children undergoing tonsillectomy demonstrated that an intravenous dose of dexamethasone notably reduced the frequency of post, operative nausea and vomiting as well as the severity of pain on the second post, operative day, with the lower pain levels occurring in the dexamethasone groups when compared to placebo [11].

LIMITATIONS

This was a single-center study with a relatively small sample size (n = 100), which may limit the generalizability of the findings. The follow-up period was short and focused only on early postoperative outcomes.

CONCLUSION

It was evidenced by this investigation that administration of a single dose of dexamethasone during surgery markedly enhanced the postoperative recovery of tonsillectomy patients. Those given dexamethasone had less pain at all points post, surgery, used rescue analgesics less (36% against 68%), started eating by mouth earlier (60% within 6 hours against

32% in the control group), and had a lower rate of PONV (12% against 36%), without a significant rise in postoperative bleeding (2% vs. 4%).

RECOMMENDATION

Based on the results of this research, it is suggested that a single intraoperative dose of dexamethasone be used routinely during the surgical treatment of patients receiving a tonsillectomy as part of perioperative management. The administration of dexamethasone can help to reduce the severity of the pain experienced after the operation, thereby lessening the patient's need for analgesics. It can also make the patient capable of taking food orally at an earlier time and prevent the occurrence of postoperative nausea and vomiting. Additional large-scale, multicenter studies with extended follow-up periods are needed to verify its long-term safety and to establish the most suitable dosing regimen for various age groups.

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CONFLICT OF INTEREST

None declared

REFERENCES

1. *Mitchell RB, Archer SM, Ishman SL, Rosenfeld RM, Coles S, Finestone SA, Friedman NR, Giordano T, Hildrew DM, Kim TW, Lloyd RM. Clinical practice guideline: tonsillectomy in children (update). Otolaryngology–Head and Neck Surgery. 2019 Feb;160: S1-42.*
2. *Rawlinson A, Kitchingham N, Hart C, McMahon G, Ong SL, Khanna A. Mechanisms of reducing postoperative pain, nausea and vomiting: a systematic review of current techniques. BMJ Evidence-Based Medicine. 2012 Jun 1;17(3):75-80.*
3. *Waldron NH, Jones CA, Gan TJ, Allen TK, Habib A. Impact of perioperative dexamethasone on postoperative analgesia and side-effects: systematic review and meta-analysis. British journal of anaesthesia. 2013 Feb 1;110(2):191-200.*
4. *Czarnetzki C, Elia N, Lysakowski C, Dumont L, Landis BN, Giger R, Dulguerov P, Desmeules J, Tramèr MR. Dexamethasone and risk of nausea and vomiting and postoperative bleeding after tonsillectomy in children: a randomized trial. Jama. 2008 Dec 10;300(22):2621-30.*
5. *Afman CE, Welge JA, Steward DL. Steroids for post-tonsillectomy pain reduction: meta-analysis of randomized controlled trials. Otolaryngology-Head and Neck Surgery. 2006 Feb;134(2):181-6.*
6. *De Oliveira GS, Almeida MD, Benzon HT, McCarthy RJ. Perioperative single dose systemic dexamethasone for postoperative pain: a meta-analysis of randomized controlled trials. Anesthesiology. 2011 Sep 1;115(3):575-88.*
7. *Buland K, Zahoor MU, Asghar A, Khan S, Zaid AY. Efficacy of single-dose perioperative intravenous steroid (dexamethasone) for postoperative pain relief in tonsillectomy patients. J Coll Physicians Surg Pak. 2012 Jun 1;22(6):349-52.*
8. *Plante J, Turgeon AF, Zarychanski R, Lauzier F, Vigneault L, Moore L, Boutin A, Fergusson DA. Effect of systemic steroids on post-tonsillectomy bleeding and reinterventions: systematic review and meta-analysis of randomised controlled trials. Bmj. 2012 Aug 28;345.*
9. *Malhotra V, Kumar V. Effect of preoperative Dexamethasone on postoperative pain in patients undergoing tonsillectomy. Indian Journal of Otolaryngology and Head & Neck Surgery. 2023 Jun;75(2):249-54.*
10. *Kaan MN, Odabasi O, Gezer E, Daldal A. The effect of preoperative dexamethasone on early oral intake, vomiting, and pain after tonsillectomy. International journal of pediatric otorhinolaryngology. 2006 Jan 1;70(1):73-9.*
11. *Rahman MM, Islam MJ, Kubra K, Tania NE, Ferdous A. Effect of Dexamethasone in Management of Postoperative Nausea, Vomiting and Pain After Tonsillectomy in Paediatric Patients. Glob Acad J Med Sci. 2023;5.*