



COMPARISON OF ANALGESIC EFFECT OF PERITONSILLAR INFILTRATION WITH BUPIVACAINE VERSUS BUPIVACAINE-DEXAMETHASONE IN CHILDREN UNDERGOING TONSILLECTOMY.

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ABSTRACT... Objective: To compare analgesic effect of peritonsillar infiltration with bupivacaine versus bupivacaine-dexamethasone in children undergoing tonsillectomy. **Study Design:** Randomized Control study. **Setting:** Aziz Fatimah Hospital, Faisalabad. **Period:** 01-03-2018 to 31-12-2018. **Material & Methods:** 80 patients were enrolled in the clinical study using non-probability consecutive sampling technique. They were divided into two groups, before start of surgery group BD received peritonsillar infiltration of bupivacaine and dexamethasone combination, whereas group B received local infiltration of bupivacaine only. Primary outcome measures were pain score recorded immediately after recovery of patient (0 hour) and at 2, 6, 12 and 24 hours after surgery and requirement for analgesia postoperatively. Other parameters recorded were time to first oral intake and sleep pattern over 24 hours. **Results:** Mean pain scores in group BD were 0.075, 0.225, 1.675, 0.75, 0.275 and in 1 group B were 0.65, 0.975, 2.95, 1.5, 0.95 at 0, 2, 6, 12, 24 hours postoperatively respectively. 92.5% patients in group BD and 57.5% in group B had good sleep whereas 7.5% in group BD and 42.5% in group B had disturbed sleep. 6 patients in BD group and 26 in B group required analgesia. **Conclusion:** Our study concluded that infiltration of tonsillar fossa with bupivacaine – dexamethasone prior to the start of surgery provides better postoperative analgesia, early start of oral intake, less rescue analgesic requirements and better sleep pattern.

Key words: Analgesia, Bupivacaine, Dexamethasone, Pain Score, Tonsillectomy.

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INTRODUCTION

Acute and chronic tonsillitis is a common disease of childhood. Acute infections can be treated successfully with antibiotics but chronic cases with relapses and remissions require surgery.¹ Tonsillectomy; a common surgical procedure in pediatrics is associated with considerable pain. Oropharynx and tonsillar bed have very rich nerve supply with high representation in somatic cerebral cortex. Thus analgesia provided should be safe, with good effect and devoid of any side effects.² Up till now factors for increased postoperative pain, after a surgical procedure which is considered a minor one, have not been clearly established. Though younger females are at increased risk as observed in a study. Moreover, it has been found that considering tonsillectomy a minimally invasive procedure patients are mostly

under treated as far as pain is concerned.¹⁰ Conventionally it has been treated with opioids and NSAID's while dealing with complications associated with these drugs. Postoperative pain management in children is a challenging task. Over the time there is considerable progress in evaluation and techniques for management of pain.³

Various chemical mediators released as a result of surgically inflicted wound cause stimulation of nociceptors and as a result patient perceives pain. Post tonsillectomy pain is multifactorial, it affects patient's behavior, induces stress, and adds to the morbidity.⁴ The response of individual patient to pain varies widely. As a preemptive analgesic strategy pain pathway interruption at the level of type C fiber stimulation may be effective in these

patients.⁵

Infiltration of local anesthetic agents into tonsillar fossa have been studied in different studies with variable outcomes. These include lidocaine and different concentrations of bupivacaine, alone or with adjuncts such as tramadol, dexamethasone, pethidine and magnesium.⁶

Bupivacaine is a local anesthetic agent with a longer duration of action, used clinically for pain management.⁷ Bupivacaine local infiltration prior the surgical incision may provide analgesic effect for the duration beyond the standard duration of effect, as possible by the theory of neuroplasticity.⁸

Dexamethasone has analgesic, anti-inflammatory as well as antiemetic properties. When given intravenously it increases duration of effect of locally infiltrated local anesthetic agents. Considering this property of steroids, it is thought that upon co-administration they may also enhance analgesic effect of local anesthetic agent.⁹ This prolongation in duration of analgesia improves patient's comfort and reduces consumption of opioids.¹¹ The purpose of this study is to identify whether dexamethasone co-administration enhances the analgesic effect of locally infiltrated Bupivacaine in children undergoing tonsillectomy or not. We could not find any local data for this specific study in tonsillectomy patients, so it will be very helpful in determining a preemptive analgesic technique for these patients.

MATERIAL & METHODS

This randomized control study was conducted at Aziz Fatimah Hospital, Faisalabad since 01-03-2018 to 31-12-2018 after taking approval from ethical review committee. 80 patients were enrolled in the clinical trial using non-probability consecutive sampling technique. Children from 7-12 years of age, with chronic tonsillitis, tonsillar hypertrophy, ASA I & ASA II, who understood pain scales were included in the study. Children below 7 years, allergies to study drugs, upper respiratory tract infection, inability to understand pain scales were excluded. Patients were divided into two groups by using simple randomization with 40 patients in each group.

Written informed consent was taken from parents. Study drugs were prepared by the anesthetist who is not involved in data collection procedure. Surgeon and the anesthetist responsible for data collection were blind to the type of drug administered. Group BD patients received peritonsillar infiltration of dexamethasone 0.2mg/kg plus bupivacaine 0.5% 1mg/kg before start of surgery. The second Group B received only bupivacaine 0.5% 1 mg/kg infiltration prior to surgical incision. Half of the total volume of the drug was infiltrated in each tonsil.

Basic monitors were attached to all the patients including pulse oximeter, blood pressure cuff, ECG electrodes, temperature probe. Intravenous infusion was started. Injection atropine 0.01mg/kg and injection nalbuphine 0.2mg/kg was given intravenously to all patients. Anesthesia was induced with injection Pentothal and intubation done after administration of injection succinylcholine 1.5mg/kg. After confirming correct endotracheal tube placement, it is secured with the help of tape. Before start of the surgical procedure, study drugs were infiltrated at upper and lower tonsillar poles bilaterally. Anesthesia was maintained with oxygen, nitrous oxide mixture (50:50) with 1.2 MAC isoflurane plus intermediate acting muscle relaxant. Patient's vitals were monitored throughout the procedure. At the end of procedure patients were recovered from anesthesia and monitored in recovery room and later on shifted to the ward.

After tonsillectomy pain score was assessed immediately after recovery from anesthesia (0 hour) and later on at 2, 6, 12, 24 hours in ward by resident anesthetist on specialized proforma. Tool used for pain evaluation were NRS (numerical rating scale) or Wong Baker (faces pain scale), whichever was better understood by patient in pre-operative period. Injection paracetamol 15 mg/kg body weight was given in case of pain score ≥ 4 and injection nalbuphine 0.2mg/kg if pain score ≥ 6 . Patients sleep pattern over first 24 hours and first oral intake time were recorded.

Data Analysis

Data was entered and analyzed by using SPSS

version 18.

Mean and standard deviation were calculated for quantitative variables (age, weight).

Frequency and percentages were calculated for qualitative variables (quality of sleep, need for analgesia, first oral intake).

Confounders were controlled through stratification. Chi square test and t-test for 2 Dependent means were applied by keeping $p \leq 0.05$ as significant.

RESULTS

In our study mean age of patients in group BD was 8.91 ± 1.74 and in group B was 8.97 ± 1.56 ; whereas mean weight in group BD was 26.76 ± 6.25 and in group B was 25.70 ± 5.50 . 57.5% patients in BD group and 47.5% in B group were females while 42.5% in group BD and 52.5% in group B were males (Table-I).

Patients in group BD showed mean pain scores of 0.075, 0.225, 1.675, 0.75, 0.275 and in group B patients showed mean pain scores of 0.65, 0.975,

2.95, 1.5, 0.95 at 0 (immediate), 2, 6, 12, 24 hours postoperatively respectively. P value was 0.0027, which showed significantly less pain in patients who received local infiltration with bupivacaine-dexamethasone as compared to bupivacaine alone (Table-II).

92.5% (n=37) patients in group BD and 57.5% (n=23) in group B had good sleep for minimum 7 hours, while 7.5% (n=3) patients in group BD and 42.5% (n=17) in group B had disturbed sleep during postoperative period, $p = 0.0003$ (Table-III).

Analgesia was required by 15% (n=6) in group BD and by 65% (n=26) in group B, while 85% (n=34) in group BD and 35% (n=14) in group B did not have pain score of 4 or above and thus did not require rescue analgesia, $p < 0.00001$ (Table-IV). None of the patients in group BD while n=3 Patients in group B required opioid analgesia after surgery in first 24 hours, in rest of the cases injection paracetamol was sufficient.

Group	AGE (mean±SD)	WEIGHT (mean±SD)	Gender %	
			M	F
BD (n=40)	8.91 ± 1.74	26.76 ± 6.25	17(42.5%)	23(57.5%)
B (n=40)	8.97 ± 1.56	25.70 ± 5.50	21(52.5%)	19(47.5%)

Table-I. Age, Weight and Gender.

Group	PAIN SCORE Mean ±SD					P-Value
	0 hour	2 hours	6 hours	12 hours	24 hours	
BD	0.075 ± 0.345	0.225 ± 0.417	1.675 ± 1.330	0.75 ± 0.622	0.275 ± 0.446	0.0027
B	0.65 ± 0.936	0.975 ± 1.274	2.95 ± 1.642	1.5 ± 1.688	0.95 ± 1.263	

Table-II. Pain scores.

Group	Sleep good	Disturbed	P-Value
BD (n=40)	37 (92.5%)	3 (7.5%)	0.0003
B (n=40)	23 (57.5%)	17 (42.5%)	

Table-III. Sleep Pattern.

Group	Analgesia required		P-Value
	Yes	No	
BD (n=40)	6 (15%)	34 (85%)	< 0.00001
B (n=40)	26 (65%)	14 (35%)	

Table-IV. Analgesia requirement.

Patients in group BD resumed oral intake earlier within 2 to 6 hours postoperatively than group B; 82.5% (n=33) versus 45% (n=18), 17.5% (n=7) in group BD and 55% (n=22) in group B failed to take orally up till 6 hours after surgery $p=0.0004$.

DISCUSSION

According to the results of our study patients in BD group (n=40) who received local infiltration of bupivacaine and dexamethasone showed lower mean pain scores during 24 hours in postoperative period at all the times as compared to group B patients (n=40) who only received bupivacaine peritonsillar infiltration prior to the start of surgery. Mean pain scores in group BD were 0.075, 0.225, 1.675, 0.75, 0.275 while in group B patients showed mean pain scores of 0.65, 0.975, 2.95, 1.5, 0.95 at 0, 2, 6, 12, 24 hours postoperatively respectively. P value was 0.0027. Analgesics requirement were also less in patients of combination group with $p<0.00001$. These results are comparable with those of Bayram A et al, they observed good analgesia and lesser rescue analgesics requirement with levobupivacaine and dexamethasone peritonsillar infiltration.¹²

The results are also similar to those of Basuni AS et al, who showed a markedly prolonged duration of analgesia in combination group patients. Total dose of rescue analgesic required was also less in this group.¹³ Another study used ropivacaine instead of bupivacaine with dexamethasone for peritonsillar infiltration and showed promising results in combination group in terms of postoperative analgesia, opioid requirements, intake of first meal, with minimum complications as compared to only ropivacaine infiltration. These results are similar to our study in which 15% patients (n=6) in BD group and 65% (n=26) in B group required analgesia. 82.5% patients in dexamethasone-bupivacaine group started taking orally within 2 to 6 hours of surgery as compared to 45% patients in bupivacaine only group.¹⁴ Vlok R et al also reviewed 11 randomized control trials and concluded that addition of dexamethasone to locally infiltrated local anesthetic agents results in better pain control and need for additional

analgesics after tonsillectomy. These findings are similar to that of our study.¹⁵

CONCLUSION

Our study concluded that peritonsillar infiltration with bupivacaine-dexamethasone before start of surgery provides superior analgesia in postoperative period as compared to infiltration with bupivacaine alone. The combination group patients also had good sleep, started oral intake earlier and required less analgesia as compared to bupivacaine alone group. So bupivacaine-dexamethasone is a better choice for provision of preemptive analgesia in children undergoing tonsillectomy. Further work is needed to establish the usefulness of this technique.






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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Asif Sagheer	Data analysis, results and conclusion.	
3	Muhammad Saleem	References and data collection.	
4	Khansa Tariq	Proof reading.	
5	Samina Aslam	Helped in discussion writing and final editing.	
6	M. Masood Iqbal	Data collection.	