ORIGINAL ARTICLE

BUPIVACAINE INFILTRATION VERSUS DICLOFENAC SUPPOSITORY FOR POST-TONSILLECTOMY PAIN RELIEF IN PAEDIATRIC PATIENTS

Nayna S Solanki[1], Mihir Goswami[2], Neelam Thaker [3]

[1]Assistant Professor of Anaesthesiology, Gujarat Cancer Society Medical College, Ahmedabad [2]Associate Professor of Community Medicine, GMERS Medical College, Gotri, Vadodara [3]Ex. Assistant Professor, Department of Anaesthesia, B J Medical College, Ahmedabad

ABSTRACT

Background: Pain management after tonsillectomy in children remains a dilemma for anaesthesiologist. The study was designed to compare the effect of pre-incisional infiltration of Bupivacaine (0.25%) versus Diclofenac suppository on postoperative pain relief in children.
Methodology: Fifty patients of American Society of Anaesthesiology grade – I, aged between 1 and 15 years undergoing elective tonsillectomy were selected. They were randomly divided equally into group A and B. Five minutes before incision, peritonsillar fossa were infiltrated with 5 ml Bupivacaine(0.25%) in group A patients. Group B received Diclofenac suppository 2mg/kg after induction. Intra operatively all patients were observed for vital parameters. Post-operatively all the patients were observed for 24 hours for analgesia using observer pain scale, analgesic requirement, vital data and other complications.
Result: Diclofenac suppository is a better option for post-operative analgesia in paediatric patients undergoing tonsillectomy as compared to bupivacaine infiltration as there were significant difference in pain score ($P<0.05$) after two hours onwards post operatively. Complications like bradycardia, hypotension, allergic reaction and convulsion were not found in either group.
Conclusion: Diclofenac suppository is a better option as compared to pre-incisional bupivacaine infiltration because of its convenience and duration of analgesia.

KEYWORDS: Tonsillectomy, Postoperative analgesia, Diclofenac, Bupivacaine

INTRODUCTION

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Modern anaesthesiologists are not only concerned about pre-operative and intra operative care of the patient but also with postoperative welfare of the patient. Tonsillectomy is one of the most commonly performed paediatric surgery. With the improvement of surgical techniques; complications have been decreased but still complications like post-operative pain and nausea are cause of concern.

In present study we have compared the efficacy of injection Bupivacaine 0.25% infiltration versus Diclofenac suppository for post tonsillectomy pain relief in paediatric patients.

METHODS

Fifty children aged 1to15 years, of both sex and different weight and American Society of Anaesthesiology (ASA) risk I undergoing tonsillectomy were studied.

All patients were assessed and examined one day prior to surgery. History of major illnesses like tuberculosis, bronchial asthma, drug sensitivity, hospitalization and history of any operation were asked. Children with positive history of these were excluded from the study.

Preoperative visit was done to allay anxiety and to establish good rapport with the patient.

After clinical evaluation and routine investigations, all patients were pre-medicated with injection Glycopyrrolate 3-5 microgram/kg intravenously. Pre-induction vitals were noted. Pre-oxygenation was done for 3 minutes. General anaesthesia was induced with injection Thiopentone sodium 5-7 mg/kg intravenously and naso-tracheal intubation was facilitated with nasal cuffed endotracheal tube with injection suxamethonium chloride 1.5-2 mg/kg intravenously.

For present study, total 50 patients were divided randomly in to two equal groups, A and B.
Group A: Injection Bupivacaine (0.25%), 5 ml, 5 minute before surgery in both tonsillar bed.
Group B : Diclofenac suppository 2mg/kg after induction.

Anaesthesia was maintained with O_2 : N_2O (50:50), intermittently intravenous vecuronium bromide and Isoflurane. Ventilation was controlled throughout surgery. Intraoperatively, Pplse,blood pressure, SpO_2 and electrocardiograph were continuously monitored. After surgery, residual neuromuscular block was reversed with injection Glycopyrrolate 6-8 microgram/kg nd Neostigmine 40-70 microgram/kg intravenously. Patients were extubated after thorough oral and nasopharyngeal suction.

Observer pain scale (OPS) score was recorded at 1, 2, 3, 6, 12 and 24 hours after surgery. Whenever the child had OPS score ≥4, a rescue dose of analgesic syrup Paracetamol 15mg/kg was administered orally. Thus duration of analgesia was calculated from end of surgery to the first dose of rescue analgesic given.

Table 1: Observer Pain Scale (OPS)

Observations	Score
Laughing, Euphoric	1
Happy, Contended	2
Calm or Asleep	3
Mild to moderate Pain; Crying, Grimacing, Restlessness, Can distract with toy, food or parental presence	4
Crying / Screaming / Inconsolable	5

RESULTS

Table 2: Demographic data and duration of surgery of studied groups

Variables	Group A (n=25) Mean ± SD	Group B (n=25) Mean ± SD	P value
Age (years)	09.08 ± 2.8	09.68 ± 2.8	> 0.05
Weight (kg)	18.72 ± 4.6	20.48 ± 4.6	> 0.05
Duration of surgery in minute	48.40 ± 2.4	48.00 ± 2.5	> 0.05

Both the groups were similar with respect to demographic data and duration of surgery in minutes (p >0.05).

Table 3: Pre-operative and intra-operative pulse rate per minute of studied groups

Time (min)	Gr- A(n=25) Mean ± SD	Gr- B(n=25) Mean ± SD	P value
Pre-operatively			
0	99.2 ± 9.18	101.4 ± 10.4	>0.05
Intra-operatively			
10	100.88 ± 8.72	106.64 ± 9.5	<0.05
20	101.68 ± 8.12	106.8 ± 8.5	<0.05
30	100.08 ± 7.34	106.72 ± 7.87	<0.05
40	101.28 ± 6.85	106.24 ± 7.80	<0.05
50	101.6 ± 5.83	105.84 ± 7.57	<0.05
60	100.16 ± 6.48	105.2 ± 7.55	<0.05

Table 4: Post operative pulse rate per minute of studied groups at different time

Time (Hours)	Group A(n=25) Mean ± SD	Group B(n=25) Mean ± SD	P value
1	97.92 ± 6.82	98.48 ± 7.88	>0.05
2	98.72 ± 7.61	97.6 ± 8.02	>0.05
3	100.32 ± 6.24	97.84 ± 7.91	>0.05
6	104.96 ± 6.22	97.52 ± 7.31	<0.05
12	104.72 ± 6.13	98.72 ± 7.44	<0.05
24	103.84 ± 6.14	98.96 ± 7.14	<0.05

Table 3 shows that there was no difference preoperatively in pulse rate between both groups. However, intra-operatively pulse rate was statically significant higher in Diclofenac suppository group (P<0.05).

Table 4 shows that there was no difference in pulse rate between both groups at 1, 2 and 3 hours post operatively. However, pulse rate was statically significant lower in Diclofenac suppository group at 6, 12 and 24 hours post-operatively (P<0.05).

Table 5: Observer Pain Scale (OPS) score post operatively of studied groups

Duration (hours)	Group A (n=25) Mean ± SD	Group B (n=25) Mean ± SD	P Value
1	2.84 ± 0.3	2.96 ± 0.2	>0.05
2	2.84 ± 0.3	3 ± 0.0	<0.05
4	2.76 ± 0.4	3 ± 0.0	<0.05
8	3.96 ± 0.7	3 ± 0.4	<0.05
12	4.0 ± 0.65	3.4 ± 0.5	<0.05
24	3.5 ± 0.5	3.2 ± 0.4	<0.05

we observed that at and after 2 hours post operatively, the difference in OPS score in group A (0.25% Bupivacaine injection) and group B (Diclofenac suppository 2mg/kg) became significant (P<0.05). Thus group B showed statically significant longer duration of analgesia than group A (Table 5). Moreover, group A had 76% of patients with pain while in group B, none of the patient had pain at 8 hours post operatively. At 12 hours postoperatively, 80% of patients in group A, while 40% of patient in group B had pain and at 24 hrs, 66% of patients had pain in group A compared to 32% of patients in group B.

Nausea occurred in 2 patients in both groups. Vomiting occurred in 2 patients in both groups. It was treated with injection Ondansetron. Bleeding occurred in 4 patients in group A and in 3 patients in group B which was treated conservatively.

DISCUSSION

Tonsillectomy is one of the most commonly performed paediatric surgical procedure. Many patients experience pain and nausea postoperatively. Early postoperative pain following tonsillectomy remains a significant obstacle to speedy recovery and smooth convalescence. So, adequate pain relief is required not only on humanitarian ground but also to ameliorate harmful effect.

In present study, we have demonstrated the efficacy of diclofenac suppository (Group B) over Bupivacaine infiltration (Group A) in providing effective and long duration post-operative analgesia for post tonsillectomy pain relief. The OPS score of both groups was equal at 1, 2 and 4 hours post operatively and till that no patient in either group had perceived pain. But at 8, 12 and 24 hours, the OPS score of Group B was lower than Group A. This could be because of rapid onset of action with diclofenac suppository and slower absorption, which prolongs its duration and its anti-inflammatory action, which may exert tissue reaction to surgery resulting in a lesser degree of perceived pain. In comparison to diclofenac suppository, analgesic effect of bupivacaine lasts only for 3-4 hours which explained by higher OPS score of Group A at 8, 12 and 24 hrs postoperatively ($p < 0.05$).

C.H. Watters et al[1] in 1987 assessed Diclofenac sodium as an analgesia for post-operative pain following paediatric tonsillectomy in a random double blind trial. In a comparison made with pethidine, diclofenac was shown to be an effective analgesic. Patients received diclofenac 1mg/kg and concluded that children who received diclofenac were more co-operative and less drowsy post-operative than those given pethidine.

Moores M. A. et al[2] in 1990 did a study on comparison of rectal diclofenac with caudal bupivacaine after inguinal herniotomy. They concluded that caudal bupivacaine provided more pain free patients at first but later the incidence of pain was similar in the two treatment groups. Rectal diclofenac is a useful alterative to caudal block in this age group of patients. This was similar to our study where in bupivacaine infiltration group patients; pain was not there in all patients up to 4 hours post-operatively. In our study none of the patients had postoperative pain in either group in contrast to Moores' study where caudal bupivacaine was better than rectal diclofenac in early post-operative period. This difference could be because of the dose of diclofenac suppository 2mg/kg in our study, as compared to 0.25mg/kg in study of Moores.

Johansen M at al[3] in 1996 carried out study and evaluated the effect of pre-incisional infiltration with bupivacaine in tonsillectomy and conclusion was that pre-operative blocking of nociceptive impulses reduced prolonged post operative pain.

Leont D V[4] in 2004 suggested that NSAIDs in children for pre-operative and post operative analgesia essentially improves post operative course and contributes to fast rehabilitation of patients.

Ejnell at al[5] demonstrated in their study that diclofenac sodium is the only NSID for postoperative pain relief, which is safe to administer in its therapeutic range with least or no side effects. Our study also suggested significant analgesia activity of diclofenac and it was also free from major side effects.

CONCLUSION

Diclofenac suppository is a better option as compared to pre-incisional bupivacaine infiltration because of its convenience, efficacy equivalent to that of bupivacaine infiltration and duration of analgesia more than bupivacaine infiltration. Complications like bradycardia, hypotension, allergic reaction and convulsion were not found in either group.

REFERENCE

1. C.H. Watters. C.C. Patterson, H. M. L. Mathews and W. Campbell Diclofenac sodium for post – tonsillectomy pain in children, Anaesthesia, 1988, Volume 43 pages 641 – 643.
2. Moores M A et al. Paediatric postoperative analgesia. A comparison of rectal diclofenac with caudal bupivacaine after inguinal herniotomy. Anaesthesia 1990; 45: 156 – 158.
3. Johansen M, Harbo G, Illum P. Preincisional infiltration with bupivacaine in tonsillectomy. Arch Otolaryngol Head Neck Surg. 1996 Mar; 122(3):261 – 3.
4. Leont D.V. et al. Post operative analgesia with nonsteroidal anti-inflammatory drugs in children. Anesteziol Reanimotol 2004 Jan-Feb;(1):54 – 57.
5. Ejnell H. Et al. Treatment of postoperative pain with diclofenac in uvulopalatopharyngeoplasty. British Journal of Anaesthesia, 1992;68:76 – 80.