

POSTOPERATIVE PAIN MANAGEMENT WITH LOCAL INFILTRATION IN HERNIOTOMY WOUND AND ORAL ANALGESIA IN CHILDREN

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ABSTRACT

Post operative pain management in children is one of the most challenging job to anaesthetic as well as to surgeon. Adequate analgesia in children is necessary to reduce parent's distress after any surgery. This study was carried out to assess the subjective adequacy of combined approach local anaesthesia and oral analgesia after inguinal herniotomy surgery in children. It was a prospective study done in a remote district of Nepal. Adequacy of postoperative pain management was observed subsequently after herniotomy, an inguinal surgery in 80 children by administrating of bupivacaine 0.5% subfacial infiltration and oral analgesia combination syrup of ibuprofen and paracetamol. Children's Hospital Eastern Ontario Pain Scale (CHEOPS) was used to access the adequacy of pain management. out of 80 children, pain score <6 was observed in 95.5% children that signify the adequacy of pain management. Among behavioral score the commonest neutral behavior in torso was found in 75% children. Likewise, no cry in 73%, smiling in 70%, positive in 70%, not touching in 74%, neutral behavior in 74% were observed in cry, facial, child verbal, torso, touch and legs respectively. Local wound infiltration with 0.5% Bupivacaine is a simple and effective method in pain management in herniotomy cases which gives satisfaction to the children as well as their parents.

Keywords: *local infiltration, postoperative pain management*

INTRODUCTION

Local infiltration with 0.5% Bupivacaine in herniotomy cases in children provides effective postoperative analgesia. This can be provided by caudal block also. But the motor block produced by caudal anaesthesia is avoided with the use of local infiltration¹. A 0.5% solution of bupivacaine which has got four to eight hours duration of action has been used in many studies². The use of local bupivacaine along with oral analgesics, a combination of Paracetamol and Ibuprofen is particularly suitable for day care surgery in camp set up. With the use of these agents the nausea, vomiting and sedation which are frequently associated with the administration of parenteral opioids are also avoided^{1,2,3}. Moreover 2mg/kg of Bupivacaine is less likely to cause systemic toxicity unless accidental infiltration to intravenous route. However episodes of systemic toxicity has been reported due to very excessive dosing of: bupivacaine 3.75 mg/kg along with lidocaine 7.5 mg/kg.⁵ On the other hand local infiltration in herniotomy cases for pain management has been seen more effective and cost effective. It has lessened the psychological as well as physical tension to parents a well. So the purpose of this study is to assess the efficacy of local infiltration with 0.5% Bupivacaine in herniotomy wound in camp set up.

MATERIAL AND METHODS

This prospective study was carried out in 2007 in Rukum, one of the most remote districts of Nepal. Total of 80 children had herniotomy an inguinal surgery done under intravenous ketamin and midazolam. Midazolam 0.1mg/kg body weight with Ketamin 2mg per kilogram body weight intravenous was given to all the cases as a anaesthetic agents after adequate venous assess. Atropine 0.02mg/kg. intravenous was given as a premedication. Anaesthesia was maintained with increment dose of IV Ketamine.

Local infiltration was done with 2mg/kg of 0.5 % Bupivacaine in the herniotomy wound to all the children had. Oral syrup Paracetamol 15mg/kg with Ibuprofen 10mg/kg every 8 hourly was given to all children after 2 hours postoperative. Extra dose of analgesics was given as per need. A total of 80 children had herniotomy done under IV ketamine and Midazolam. All the children had local infiltration with maximum of 2 mg/ kg of 0.5 % Bupivacaine at the completion of surgery. Pain intensity assessed at 2 hour, 4 hour, 8 hour, and 12 hour postoperatively using Children's Hospital Eastern Ontario Pain Scale (CHEOPS). Oral analgesic, a combination of paracetamol and Ibuprofen was given to all the children after

2 hours of surgery when child became fully awake.

The Children's Hospital of Eastern Ontario behavioural Pain Scale (CHEOPS) was used to assess a quantitative pain measurement during observation the wound. The CHEOPS of <6 was considered relatively pain free condition, whereas CHEOPS of 9 and >9 was considered as severe pain. Pain intensity was assessed at 2 hour, 4 hour ,8 hour, and 12 hour using Children,s Hospital Eastern Ontario Pain Scale(CHEOPS) as follows:

Children's Hospital Eastern Ontario Pain Scale (CHEOPS)

	Behavioral		Definition	Score
Cry	No cry	1	Child is not crying.	
	Moaning	2	Child is moaning or quietly vocalizing silent cry.	
	Crying	2	Child is crying, but the cry is gentle or whimpering.	
	Scream	3	Child is in a full-lunged cry; sobbing; may be scored with complaint or without complaint.	
Facial	Composed	1	Neutral facial expression.	
	Grimace	2	Score only if definite negative facial expression.	
	Smiling	0	Score only if definite positive facial expression.	
Child Verbal	None	1	Child not talking.	
	Other complaints	1	Child complains, but not about pain, e.g., "I want to see mommy" of "I am thirsty".	
	Pain complaints	2	Child complains about pain.	
	Both complaints	2	Child complains about pain and about other things, e.g., "It hurts; I want my mommy".	
	Positive	0	Child makes any positive statement or talks about others things without complaint.	
Torso	Neutral	1	Body (not limbs) is at rest; torso is inactive.	
	Shifting	2	Body is in motion in a shifting or serpentine fashion.	
	Tense	2	Body is arched or rigid.	
	Shivering	2	Body is shuddering or shaking involuntarily.	
	Upright	2	Child is in a vertical or upright position.	
	Restrained	2	Body is restrained.	
	Touch	Not touching	1	
Reach		2	Child is reaching for but not touching wound.	
Touch		2	Child is gently touching wound or wound area.	
Grab		2	Child is grabbing vigorously at wound.	
Restrained		2	Child's arms are restrained.	
Legs	Neutral	1	Legs may be in any position but are relaxed; includes gentle swimming or separate-like movements.	
	Squirm/kicking	2	Definitive uneasy or restless movements in the legs and/or striking out with foot or feet.	
	Drawn up/tensed	2	Legs tensed and/or pulled up tightly to body and kept there.	
	Standing	2	Standing, crouching or kneeling.	
	Restrained	2	Child's legs are being held down.	

RESULTS

Among 80 children male female ratio was 1.5:1. The minimum and maximum surgical time was 5 to 20 minutes respectively. A total of 92.5% children had Children’s Hospital Eastern Ontario Pain Scale <6 which showed very effective pain management technique whereas 7.5% had > 6 scores (figure 1). Out of 80 children who had herniotomy 91% (73) did not have postoperative pain (figure 2). Like wise 87.5 % (70) were smiling and had positive facial expression (figure 3). Verbal behavior symptoms like Child makes any positive statement or talks about others things without complaint was 87.5 % (70) (figure 4). Other behavioral symptoms such as Torso was inactive in 93.7% (75)(figure 5);Child is not touching or grabbing at wound in 92.5%(74)(figure 6) and Legs may be in any position but are relaxed; includes gentle swimming or separate-like movements was in 92.5%(74) (figure 7).

Figure 1: CHEOPS mean value

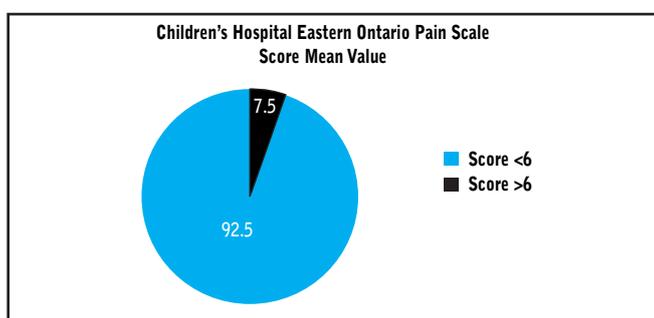


Figure 2: Frequency distribution of cry as behavioral symptoms

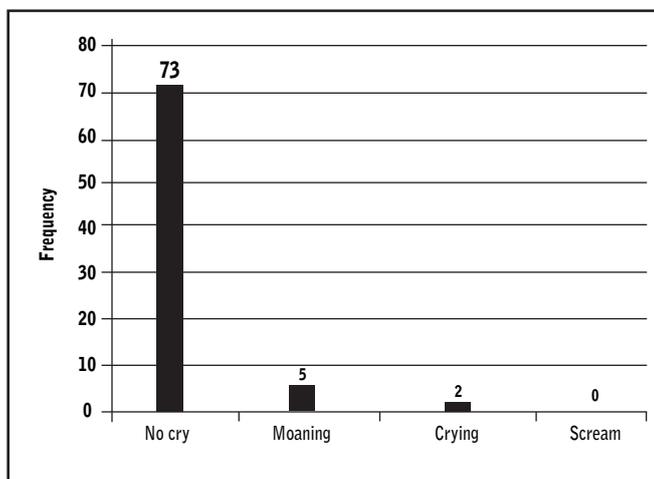


Figure 3: Distribution of Facial behavioral symptoms

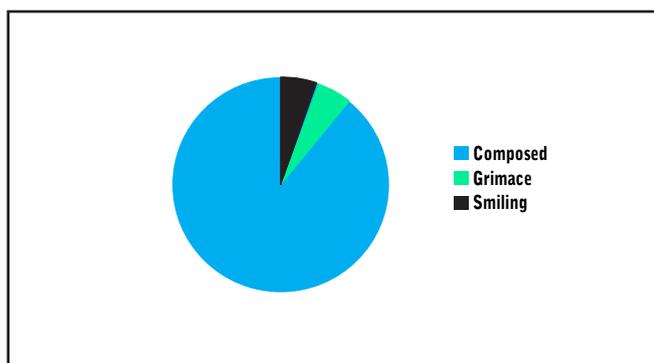


Figure 4: Facial behavioral symptoms

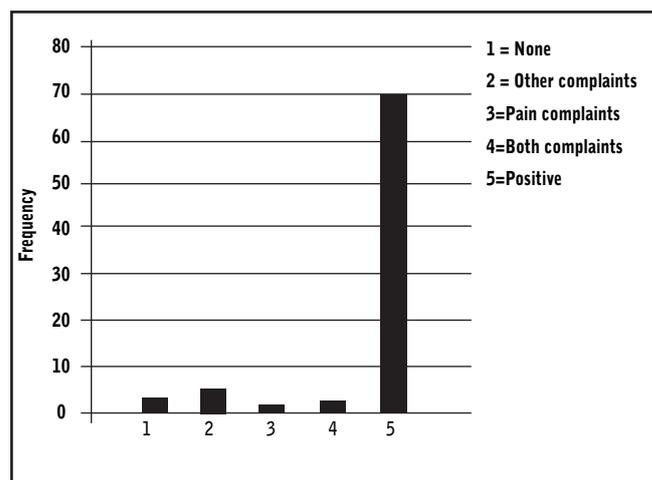


Figure 5: Torso behavioral symptoms

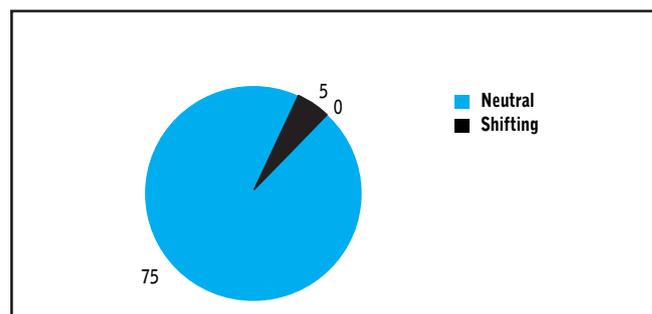


Figure 6: Touch behavioral symptoms

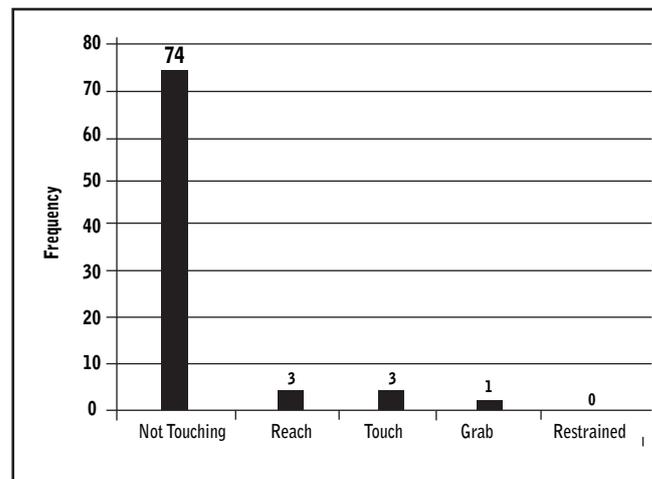
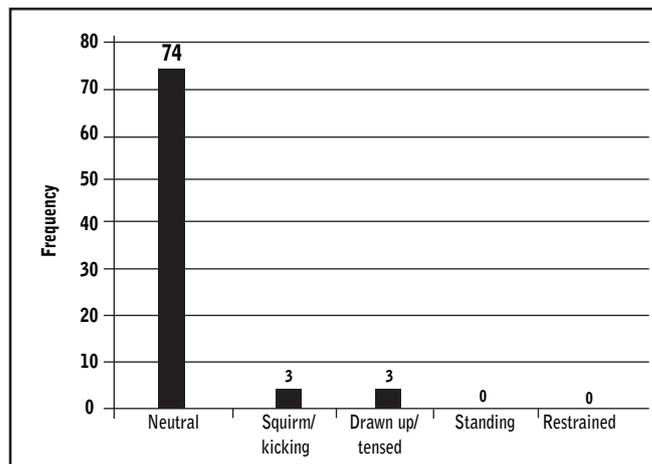


Figure 7: Behavioral symptoms at legs



DISCUSSION

Adequate analgesia after inguinal herniotomy in children is essential and may be obtained through various techniques. These methods include the administration of opioids, such as codeine, the administration of nonsteroidal antiinflammatory drugs, such as ketorolac, and the use of regional anesthetic techniques, such as local anesthetics and caudal anesthesia. Each of these techniques has their advantages and disadvantages, and they have proved efficacy when compared with placebo. Some of these methods have been compared to determine if one is superior with respect to pain control or adverse effects. When an inguinal field block was compared with caudal anesthesia, the investigators concluded that they had similar effects on postoperative analgesia.⁸ In practice field block appears to be the technique of choice in many pediatric institutions because it is usually effective and has low cost and minimal risks. Local anesthesia is typically effective but studies have shown that supplementation with either a nonsteroidal anti-inflammatory drug or caudal block further improves analgesia. When lidocaine is used subfascially and subcutaneously the effect is better seen with the subfascial route. The reason for the better effect with SF administration could be that the pain stimuli after inguinal herniotomy are primarily generated in the SF layers, whereas the SC layers generate fewer pain stimuli.⁵ Similarly combination of wound infiltration with 0.5% bupivacaine and Ilio inguinal and Ilio hypogastric nerve blocks reduces total morphine requirements in the first 24 hour.⁸ The study done on local infiltration of 0.5% Bupivacaine alone, 0.5% Bupivacaine with 50 microgram/kg midazolam and 50 microgram of midazolam in 0.9% Saline has shown better pain relief with Bupivacaine and midazolam group than other two groups.⁹ Studies have revealed that there is no significant difference in post operative pain management in the patient with local infiltration and caudal block. However complications like urinary retention and delay in ambulation is seen more with caudal than local wound infiltration.⁴

Many other agents have been used like Caudal administration of 50 microgram per kg of midazolam with 0.25% bupivacaine has shown good analgesic result to that of Bupivacaine 0.25% alone or midazolam 50 microgram/kg in normal saline.⁶ Similarly Comparison of Intramuscular and local infiltration of ketorolac with and without local anaesthetic have been studied. Where wound infiltration with ketorolac 30 mg alone in saline, 0.25% bupivacaine alone or ketorolac 30 mg with 0.25% bupivacaine provided equivalent analgesia. However Wound infiltration with ketorolac 30 mg in saline provided analgesia superior to that of ketorolac 60 mg i.m.⁷

The result of our study reveals that 92.25 % of children who had CHEOPS of <6 score. The children who complain of pain responded well to simple analgesics. Even a single patient did not have CHEOPS of 9 and >9. Study done on Ilioinguinal nerve block and local infiltration in 49 cases have revealed 95% responding to simple analgesics in cases with local infiltration and 100% with the ilioinguinal nerve block.

Which is statistically nonsignificant with the result obtained in our study (p value 0.35)¹⁰.

Another study done on trial of three methods of intraoperative Bupivacaine analgesia for pain after paediatric groin surgery in 168 cases with 61 cases had wound infiltration alone. In this study, the children who had wound infiltration alone had 78.1.% CHEOPS score of <4. Which is statistically significant with our study. (p value 0.004)³ On evaluation of the relative effectiveness of three techniques of regional anaesthesia in the provision of postoperative analgesia in children. was carried out in another study. Where the random assignment of 183 children scheduled for groin surgery to one of three groups. Bupivacaine 0.5% plain 2 mg/kg was injected after surgery Group A received wound infiltration alone Group B had regional nerve blockade. Group C had a combination of both methods. Postoperatively, pain was assessed using the CHEOPS behavioural scales until discharge home. Satisfactory pain control was arbitrarily defined as a CHEOPS score of six or less than six. Here all three methods achieved analgesia with 80% of the pain scores. Statistically it is significant with our study. (p value)³ Similarly the study done on Subcutaneously versus subfascial administered Lidocaine in pain treatment after inguinal herniotomy on 44 cases the VAS score was significantly reduced to subfascial group than in subcutaneous group.⁵ The Study done on comparison of caudal local anaesthetic 0.25% Bupivacaine (1ml/kg) with adrenaline 5 microgram/ml in group A and Bupivacaine 0.25%/ml with clonidine 2 microgram /kg in group B and Bupivacaine 0.25%/ with 0.5mg/kg preservative free ketamin in group K; in 60 patients. Analgesia was better seen in group B and K than group A.¹¹ In the study on pre-emptive analgesia on Comparison of preoperative with postoperative caudal block for post operative pain in children, the analgesia was comparatively good in post surgery caudal group than preoperative one.¹² There are various technique of post operative pain management which are described above. Among the all local infiltration has been seen superior.

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