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Comparison of Ilioinguinal / Iliohypogastric Block and Caudal Block for Postoperative Analgesia in Children Undergoing Inguino-Scrotal Surgery

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Abstract

Background: Inguino-scrotal surgery is one of the commonest procedures in children and is associated with significant postoperative pain. Regional block is employed to provide analgesia in these procedures. The aim of the present study is to compare ilioinguinal/iliohypogastric block and caudal block for postoperative analgesia in children undergoing inguino-scrotal surgeries. *Methods and Material*: Hundred children aged 1-6 years scheduled to undergo inguino-scrotal surgeries were randomly allocated to receive either ilioinguinal/iliohypogastric block (group 2) or caudal block (group 1) with 1ml/kg of 0.125% bupivacaine. Postoperative pain was assessed with modified objective pain scale. *Statistical Analysis Used*: Chi-square test and student t test was used where applicable to determine whether there was a statistical difference between the groups in the parameters measured. P less than 0.05 was considered as statistically significant. *Results*: The duration of analgesia produced by ilioinguinal/iliohypogastric block was comparable to caudal block (342±112.4 min in group 1 and 354±98.6 min in group 2, P>0.05). the time to first voiding was earlier with group 2 compared to group 1. *Conclusion*: Ilioinguinal/iliohypogastric block is comparable to caudal block in providing postoperative analgesia in inguino-scrotal surgeries.

Keywords: Inguino-Scrotal Surgery; Caudal Block; Ilioinguinal/Iliohypogastric Block; Paediatric Age Group.

Introduction

Inguino-scrotal surgeries are the commonest procedures in paediatric age group [1] and are associated with significant postoperative discomfort. Good postoperative analgesia in children is an important factor which affects the quality of recovery, parental satisfaction, and surgical success. For adequate postoperative analgesia with these surgeries intravenous opioids or a regional analgesic modality such as caudal block or inguinal and iliohypogastric block is commonly employed [2]. Opioidin children has disadvantages such as postoperative nausea, vomiting, pruritus, somnolence, and respiratory depression [3]. Caudal block is a commonly used regional analgesic technique in children, but is associated with undesirable motor blockade and urinary retention [4]. Ilioinguinal/iliohypogastric blockade has been shown to be equally effective compared with caudal block and is devoid of motor blockade and urinary retention [5]. Thus it may be more desirable, especially in paediatric ambulatory setting.

Recently ultrasound is being increasingly used for performing regional blocks in children [6]. Ultrasound guided caudal block and ilioinguinal/iliohypogastric block has been described and studies have shown it to be better compared with landmark-based techniques [7,8]. However, ultrasound is not universally available and in resource poor developing

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countries landmark-based techniques and still in practice with good success rate. The present study was undertaken to evaluate the efficacy of caudal and ilioinguinal/iliohypogastirc block for providing postoperative analgesia in children undergoing inguino-scrotal surgeries.

Materials and Methods

After obtaining ethical committee clearance and written informed consent from parents 60 ASA physical status 1 and 2 children aged 1 to 6 years scheduled to undergo elective inguino-scortal surgeries were enrolled in the study. Children with history of cardiac, hepatic, renal, or neurological conditions and known allergy to local anaesthetics were excluded from the study. Children were randomly allocated to one of the two groups by computer generated random number table. Children randomised to group 1 received caudal epidural block with 0.125% bupivacaine in a dose of 1ml/kg and children in group 2 received ilioinguinal/iliohypogastric block with the same volume of 0.125% bupivacaine.

A standard anaesthetic regimen was followed in all children. All children were premedicated with syrup triclofos 25mg/kg. After instituting minimal mandatory monitoring, which included ECG, NIBP, pulse oximetry; children were induced with incremental concentrations of sevoflurane 1-5% in 50:50 nitrous oxide and oxygen. After loss of eyelash reflex, an intravenous line was secured and fentanyl 2mcg/kg was administered intravenously. An appropriated size proseal LMA insertion was facilitated with 0.25mg/kg atracurium. Anaesthesia was maintained with sevoflurane 1-1.5MAC. At the end of surgery, children in group 1 received caudal block with 0.125% bupivacaine 1ml/kg using 23G hypodermic needle, whereas children in group 2 received ipsilateral ilioinguinal/iliohypogastric block with 0.125% bupivacaine 1ml/kg with 23G hypodermic needle. Both blocks were performed by landmark technique. After performing the block sevoflurane was discontinued, neuromuscular blockade was reversed with neostigmine and atropine, and the child was extubated after return of adequate muscle power and airway reflexes. The assessment of pain in the postoperative period was done by an anaesthesiologist who was blinded to the group allocation. Pain was assessed at 30min, 1, 2, 4, 6, 12, and 24 hours after the surgery using a modified objective pain scale (Table 1) based on objective pain scale by Hannallah et al. [9] Maximum possible score was 8; 0= no pain and 8=severe pain. Children received fentanyl 0.5mcg/kg as rescue analgesia when pain score was more than 4. The postoperative analgesia in the two groups wascompared with respect to duration of analgesia. Duration of analgesia was defined as the time from the administration of block to first rescue analgesic. Time to first voiding was recorded. Any untoward side effects associated with these blocks were also noted.

The distribution of variables was assessed by the Shapiro-Wilk tests. A power analysis estimated a sample size of 50 patients would have an 80% power at the 0.05 level of significance to detect a 50% reduction in the number of patients requiring rescue analgesia between the two groups. Statistical analysis was done using SPSS statistics for Windows, version 18 (SPSS Inc., Chicago, Ill., USA). Chi-square test and student t test was used where applicable to determine whether there was a statistical difference between the two groups in the parameters measured. P less than 0.05 was considered as statistically significant.

Results

A total of hundred patients were enrolled in the study in the two groups. The demographic

Table 1: Objective pain scale [9]

Observation	Criteria	Points
Crying	Not crying	0
	Crying but responds to tender loving care	1
	Crying and does not respond to tender loving care	2
Movement	None	0
	Restless	1
	Thrashing	2
Agitation	Child asleep or calm	0
	Mild	1
	Hysterical	2
Posture	No special posture	0
	Flexing legs and thighs	1
	Holding scrotum or groin	2

Table 2: Demographic characteristics

Variables	Group 1 (n=50)	Group 2 (n=50)
Age (years)*†	2.4±0.8	2.5±1.1
Sex (M/F) †	28/2	29/1
Weight (kg)* †	10.7±2.7	10.5±3.2
Duration of surgery (min)* †	20.34±5.7	20.25±5.9
Type of Surgery		
Herniotomy	26	24
Hydrocelectomy	11	12
Orchidopexy	13	14

*Data presented as mean±SD, † P>0.05

Table 3: Postoperative characteristics

Variables	Group 1 (n=50)	Group 2 (n=50)
Age (years)*†	2.4±0.8	2.5±1.1
Sex (M/F) †	28/2	29/1
Weight (kg)* †	10.7±2.7	10.5±3.2
Duration of surgery (min)* †	20.34±5.7	20.25±5.9
Type of Surgery		
Herniotomy	26	24
Hydrocelectomy	11	12
Orchidopexy	13	14

*Data presented as mean±SD, †P>0.05, ‡P<0.05, statistically significant

characteristics were identical in the two groups (Table 2). There was no statistically significant difference in the duration and type of surgery. The mean duration of analgesia was 342±112.4 min in group 1 and 354±98.6 min in group 2, which was statistically comparable. The number doses of rescue analgesics required were also similar in the two groups (Table 3). The time to first voiding was earlier in group 2 compared to group 1 (180±88.4 min v/s 235±90.8, P<0.05). Five patients in group1 and four patients in group 2 had vomiting in the postoperative period, which were minor and required no medication. Two patients in group 1 and four patients in group 2 had haematoma at the block site.

Discussion

Caudal epidural block is commonly employed for inguino-scrotal surgeries in children and usually provides analgesia for approximately 4-6 hours [8]. However, it is associated with complications like bone marrow puncture, rectal puncture and danger of systemic toxicity.

It can also lead to urinary retention and prolonged voiding times in the postoperative period. This can delay hospital discharge in day care surgery. Central nervous disorders, spinal deformities, inflammation at block site and contraindications for the block. Ilioinguinal/iliohypogastric block provides a similar duration of analgesia and can be a suitable alternative to caudal block [5,9].

The present study showed that the ilioinguinal/ iliohypogastric block provides comparable duration of postoperative analgesia compared to caudal block in inguino-scrotal surgeries. In addition the time to first voiding was earlier in patients receiving ilioinguinal/iliohypogastirc block compared to caudal block.

The duration of analgesia with ilioinguinal/ iliohypogastric block in the present study is similar to that noted by Khaled R et al [10].

In previous studies [5,11] ilioiguinal/ iliohypogastric block has been found to provide comparable analgesia to caudal block. The authors have suggested it to be a suitable alternative to caudal block.

In the present day regional anaesthesia practice use of ultrasound is on the rise. Landmark based techniques in the era of ultrasound may be a limitation of the study. However, its availability in resource poor developing countries is not universal. Thus, landmark based techniques do have a role to play. Simple landmark based blocks can still be employed with good success.

Conclusion

Ilioinguinal/iliohypogastric block provides comparable duration of postoperative analgesia to caudal block and in addition has earlier voiding. Thus it can be a suitable alternative to caudal block in inguino-scrotal surgeries in children.

Acknowledgement

None

Conflict of Interest

None to declare

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