Original Research Article

Ultrasound guided nerve block versus caudal block for post-operative analgesia in children undergoing unilateral groin surgery

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Abstract

Background: Pain is an unpleasant subjective sensation which can only be experienced and not expressed, especially in children. The primary reason to treat or prevent pain is humanitarian.

Aim and objectives: To assess Ultrasound Guided Ilioinguinal / Iliohypogastric nerve block versus Caudal block for post-operative analgesia in children undergoing unilateral groin surgery in ASA grade I and II children.

Materials and methods: Sixty patients aged between 3-12 years undergoing unilateral groin surgery were included. The objectives of this study were to compare the effects of caudal block and ultrasound guided Ilioinguinal/ Iliohypogstric nerve block in terms of duration of analgesia, quality of analgesia and hemodynamic.

Results: The mean age of two groups was comparable with Mean ± SD 4.67 ± 1.4 for B group and Mean ± SD 4.7 ± 1.34 for C group, which was statistically not significant. In the present study, major number of cases came for herniotomy being 47% of total cases in both groups followed by high ligation 27% in US II/IH nerve block,23% in cauadal group, and orchidopexy 27% in II/IH nerve block group and 30% in caudal group. Mean duration of surgery of B group was 28.17±8.56 minutes, and for C group was 29.67±8.60 minutes. The difference between the means was statistically not significant (P>0.05). The baseline, intra operative heart rate changes between two groups were comparable and were statistically not significant and therapeutic interventions were not

required. There was no significant difference in quality of analgesia in both groups with P-Value >0.05. Duration of Postoperative analgesia is comparable in both the groups with Mean±SD values being 4.95±0.51 for B group and 4.78±0.49 for C group which is statistically not significant with P-Value being >0.05.

Conclusion: Ultrasound guided Ilioinguinal / Iliohypogastric nerve blocks is an ideal procedure for unilateral groin surgeries in children, regarding quality of analgesia with less pain scores and duration of analgesia is comparable with that of caudal block, with lower volume of local anesthetic.

Key words

Iliohypogastric, Caudal block, Groin surgeries.

Introduction

Pain is an unpleasant subjective sensation which can only be experienced and not expressed, especially in children. The primary reason to treat or prevent pain is humanitarian. This is even more important in children who rely completely on their parents or care givers for their wellbeing. The concept of postoperative pain relief and its utilization in the paediatric age group has improved dramatically over the recent years. The various methods of providing pain relief have some side effects which prohibit their use in children for e.g. Narcotics in children, because of their respiratory depression, the other analgesics which cannot be given for some time after general anaesthesia due to the fear of vomiting and aspiration, the objection to the needles in the case of parenterally administered analgesics. The regional anaesthetic techniques significantly decrease post-operative pain and systemic analgesic requirements. Infants and children undergo a variety of groin procedures that can cause a significant degree of discomfort postoperatively. Caudal analgesia with local analgesics alone is effective but is often short-lived and associated with undesired motor blockade and other complications [1]. Ilioinguinal/ iliohypogastric (II/IH) nerve blockade is one of the most common peripheral nerve block techniques in paediatric anaesthesia and has been shown to be equally effective compared with caudal blockade for inguinal hernia [2]. An ultrasound (US)-guided technique for II/IH has been described with significantly better block qualities compared with the landmark-based technique [3]. According to this new technique, the needle tip will be placed in close proximity to the two nerves in the correct anatomical plane between the internal oblique and the transverse abdominis muscles. Therefore, intramuscular and intraperitoneal injection of LA is safely avoided. In contrast, the performance of landmark-based II/IH nerve blocks is associated with multiple administration of LA in adjacent anatomical structures, particularly is muscle tissue [4]. Ilioinguinal nerve block is commonly used for inguinal procedures such as inguinal herniorrhaphy, orchidopexy and hydrocele repair. It is also useful for pfannenstiel incision e.g. hysterectomy, ureteric reimplantation. In the paediatric population, controversy exists regarding the choice of ilioinguinal block versus caudal block for this surgery. Initial studies failed to demonstrate superiority from either technique [5] A more recent study showed a reduction in stress hormone levels with caudal analgesia [6]. The popularity of caudally administered clonidine and ketamine has added further controversy with a recent study using caudally administered bupivacaine and ketamine showing more prolonged postoperative analgesia than fascial click ilioinguinal block [7]. However, the potential neurotoxicity of ketamine for this route needs to be clarified before routine use. Many practitioners place a caudal block for these procedures because the caudal block is relatively simple and has a high success rate. Potential advantages of the ilioinguinal block

include a low incidence of postoperative leg weakness provided low volumes are used, and the ability to place the block with the patient in the supine position. Furthermore, ilioinguinal block represents an alternative to caudal block in children in whom anatomical variants render a caudal block contraindicated or impossible. With US guidance, as little as 0.075 mL/kg of local anesthetic can reliably block both the ilioinguinal and iliohypogastric nerves [8]. Reducing the total volume of local anaesthetic is likely to reduce the spread of local anaesthetic below the inguinal ligament and therefore the incidence of unwanted femoral nerve blockade and therefore leg weakness [9]. In addition to unwanted femoral block, ilioinguinal block has been associated with bowel perforation colonic puncture and pelvic haematoma. In one report this was complicated by intestinal obstruction [10] it has been suggested that with ultrasound guided needle placement, the risk of intestinal perforation may be reduced. Caudal block is usually placed after the induction of general anaesthesia and is used as an adjunct to intraoperative anaesthesia as well as postoperative analgesia in children undergoing surgical procedures below the level of the umbilicus. Caudal analgesia can reduce the amount of inhaled and IV anaesthetic administration, attenuates the stress response to surgery, facilitates a rapid, smooth recovery, and provides good immediate postoperative analgesia. In order to decrease intra operative and postoperative analgesic requirements after single shot caudal epidural blockade, various additives such as morphine, fentanyl, clonidine and ketamine with local anaesthetics have been investigated. Bupivacaine is a long acting amide local anesthetic which has been in use for more than 40 years. Its introduction in 1957 is a very important step in the evolution of regional anaesthesia. It is commercially available as a racemic mixture containing equal proportions of the S (-) and R (+) isomers. It is widely used for subarachnoid block, epidural block, caudal block, nerve blocks, infiltration, post- operative analgesia and labor analgesia. The modification of the concentration of the drug causes differential sensory and motor block. The present study has been carried out to assess whether US- guided II/IH nerve blocks with LA would provide comparable postoperative analgesia to blind technique caudal block with LA 0.25% Bupivacaine following pediatric unilateral groin surgery.

Materials and methods

Source of data

The study was conducted in Gandhi Hospital, Secunderabad after obtaining approval from institutional ethical committee and written informed consent was obtained from each patient. Sixty patients aged between 3-12 years undergoing unilateral groin surgery were included in the study. The patients were randomly divided into two groups of 30 patients each: Group C – To receive caudal block with 0.7 ml/kg 0.25% Bupivacaine. Group B – To receive ultrasound guided Ilioinguinal/ Iliohypogastric nerve block with 0.1ml/kg 0.25% of Bupivacaine.

Inclusion criteria

Patients of either sex, aged between 3-12 years. Patients with American society of Anaesthesiologists grade I and II physical status. Elective unilateral groin surgeries of inguinal hernias, Hydroceles and Undescended testes.

Exclusion criteria

Patients less than 3 years and more than 12 years, patient refusal, Patients with coagulopathy, Patients with Peripheral Neuropathy, History of allergy to drugs, Significant pre-existing systemic diseases, Infection at the site of the block, Skeletal deformities, History of developmental delay and Failed blocks.

Procedure

For ultrasound guided IL/ IH nerve block

After aseptic preparation of both puncture site and the ultrasound probe, patient in supine position, the block was performed using “in

plane technique" and insulated 22G 40-mm needle with a facette tip and an injection line. Under direct visualization of the tip of the needle which was placed lateral to the nerve structures between the internal oblique and transverse abdominis muscles, 0.1 ml/kg of 0.25% bupivacaine injected. The distribution of LA was monitored under real time ultrasonography.

For caudal block

Under aseptic precautions, a short bevelled 22 G needle was introduced in caudal epidural space, after conforming the space 0.7 ml/kg of local anaesthetic agent 0.25% Bupivacaine was administered slowly. After deposition of the drug patients were placed in supine position and anaesthesia was maintained by 0.5% Sevoflurane, 60% of Nitrous oxide in oxygen and top up doses of vecuronium bromide ($1/5^{th}$ of the loading dose or 0.1 mg/Kg). Heart rate and Mean arterial pressure of patients are recorded just before and after surgical incision and then every 10 minutes interval till the end of surgery. Using the paediatric observations FLACC pain scale with its 0-10 score range, each patients pain intensity was assessed at the end of surgery and then every 1 hour interval until 6 hours. If the FLACC pain scale was 4 or more, rectal Paracetamol 20 mg/kg was administered. Motor block was not assessed in present study. Failure of block was defined as any increase in HR or MAP>20% than pre incision values.

Statistical analysis

Data was analysed using SPSS version 15.0 computer software. Numerical variables were presented as mean and standard deviation (Mean $\pm$ SD). Comparison between the groups was by the Kruskall-Wallis one Anova.

Results

The present study conducted in Gandhi Medical College & Hospital, Secunderabad, includes 60 patients, aged 3 years to 12 years who are posted for unilateral groin surgeries such as herniotomy, orchidopexy, and high ligation are randomly chosen and divided into two groups of 30 each. Group C received 0.25% Bupivacaine 0.7ml/kg and Group B received 0.25% Bupivacaine 0.1ml/kg. The analgesic effect and duration of analgesia of both groups was compared and contrasted. There were no clinical or statistically significant differences in the demographic profile of patients in either group.

The mean age of two groups is comparable with Mean±SD 4.67±1.4 for B group and Mean±SD 4.7±1.34 for C group, which was statistically not significant as per **Table - 1**. In the present study, major number of cases came for herniotomy being 47% of total cases in both groups followed by high ligation 27% in US II/IH nerve block,23% in cauadal group, and orchidopexy 27% in II/IH nerve block group and 30% in caudal group.

The baseline, intra operative heart rate changes between two groups were comparable and were statistically not significant and therapeutic interventions were not required.

The baseline mean arterial pressures in both the groups were comparable with mean and standard deviations being 74±4.8 for B group and 73.5±6.03 for C group. At 5, 10, 20, 30 min after skin incision the MAP values are slightly higher in caudal group when compared to ilioinguinal group which is statistically not significant (P-Value >0.05). There was no significant changes in hemodynamic parameters in two groups postoperatively with P Value > 0.05.

According to the above observations there is no significant difference in quality of analgesia in both groups with P-Value >0.05.There is slight less scores observed in ultrasound guided ilioinguinal nerve block which is statistically not significant.

Mean duration of surgery of B group was 28.17±8.56 minutes, and for C group was 29.67±8.60 minutes. The difference between the

means was statistically not significant (P>0.05). The baseline, intra operative heart rate changes between two groups were comparable and were statistically not significant and therapeutic interventions were not required (**Table – 2, 3, 4** and **Figure – 1**).

Table - 1: Demographic distribution of age in two groups.

Age in years	**Group B**		**Group C**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**
3	7	23%	6	20%	13	22%
4	8	27%	7	23%	15	25%
5	8	27%	12	40%	20	33%
6	3	10%	2	7%	5	8%
7	3	10%	1	3%	4	7%
8	1	3%	2	7%	3	5%
Total	30	100%	30	100%	60	100%
Mean ± SD	4.67 ± 1.4		4.7 ± 1.34		5.37 ± 2.31	
Significance	P>0.05					
Type of Surgery						
Herniotomy	14	47%	14	47%	28	47%
Highligation	8	27%	7	23%	15	25%
Orchidopexy	8	27%	9	30%	17	28%

Table - 2: Comparison of intra op heart rate (beats/minute) changes between two groups.

Heart rate/min	**Group B**	**Group C**	**P-Value**
Duration	**Mean ± SD**	**Mean ± SD**	
Baseline/ Before incision	102.5 ± 8.2	106.3 ± 8.19	0.08
After incision			
5 min	94.1 ± 7.3	97.7 ± 7.69	0.74
10 min	90.9 ± 6.6	94.1 ± 6.33	0.74
20 min	88.9 ± 6.1	92.1 ± 5.72	0.06
30 min	87.6 ± 5.9	90.5 ± 5.35	0.06
Post operatively HR beats/min			
0 hour	89.8 ± 5.7	92.3 ± 5.4	0.08
1 hour	87.4 ± 4.9	89.7 ± 5.5	0.09
2 hours	86 ± 4.8	89.2 ± 5.1	0.08
3 hours	85.6 ± 4.8	88.5 ± 5.1	0.06
4 hours	85.6 ± 5.1	87.9 ± 4.8	0.07
5 hours	87 ± 5.3	89 ± 3.9	0.09
6 hours	85.6 ± 5.4	89.7 ± 4.8	0.06

Discussion

Control of postoperative pain is important in paediatric patients because poor pain control may result in increased morbidity and mortality [11]. The various methods of providing pain relief have some side effects which prohibit their use in children for e.g. Narcotics in children, because of their respiratory depression, the other analgesics which cannot

be given for some time after general anaesthesia due to the fear of vomiting and aspiration, the objection to the needles in the case of parenterally administered analgesics. Caudal anaesthetics usually provide analgesia for approximately 4-6 hours. However, its complications do exist such as accidental dural or bone marrow puncture, intestinal damage, intravascular injection and systemic toxicity, infection and epidural abscess formation and epidural haematoma [12]. Central nervous disorders, spinal deformities, inflammation of the block site and coagulation disorders are contra-indications for caudal anaesthesia, so it is necessary to find a substitute to control pain [13]. Ilioinguinal/ iliohypogastric (II/IH) nerve blockade is one of the most common peripheral nerve block techniques in paediatric anesthesia and has been shown to be equally effective compared with caudal blockade for inguinal hernia repair. An ultrasound (US)-guided technique for II/IH nerve block has been described with significantly better block qualities compared with the landmark-based technique. Despite its popularity, when conventional methods are used, the II/IH nerve block only has a success rate of 70-80% in some published series. Several complications such as colonic or small bowel puncture, pelvic hematoma, femoral nerve palsy and quadriceps muscle paresis [14] have been described. According to Ultrasound guided technique, the needle tip will be placed in close proximity to the two nerves in the correct anatomical plane between the internal oblique and the transverse abdominis muscles. Therefore, intramuscular and intraperitoneal injection of LA is avoided. In contrast, the performance of landmark-based II/IH nerve blocks is associated with multiple administration of LA in adjacent anatomical structures, particularly muscle tissue. The present study has been carried out to assess whether US- guided II/IH nerve blocks with LA would provide comparable postoperative analgesia to caudal block with LA following pediatric unilateral groin surgery. The present study conducted in Gandhi Medical College, Secunderabad after obtaining approval from institutional ethical committee and written informed consent was obtained from each parent. Sixty patients aged between 3-8 years. undergoing unilateral groin surgery were included in the study. Sixty paediatric patients between age group 3 to 8 years. have been selected and randomization done and divided in to two groups who were posted for unilateral groin surgeries. In one group caudal block is given with 0.7ml/kg of 0.25%bupivacaine. In the second group ultrasound guided ilioinguinal/ iliohypogastric block given with 0.1 ml/kg of 0.25% bupivacaine. Postoperative analgesia in terms of both quality and duration is compared in both groups using "FLACC scale". Monitoring is done until the duration of analgesia. Failed Blocks: Intraoperative haemodynamics namely heart rate, mean arterial pressure, SpO2, Quality of analgesia in terms of FLACC scale, Duration of analgesia using FLACC scale.

Duration of analgesia

In Present study the mean duration of analgesia for US Guided Ilioinguinal/ Iliohypogastric nerve block is 4.95 hours. and Caudal Block is 4.8 Hrs. with P value 0.2 (>0.05). It shows that there is no significant difference in duration of postoperative analgesia between two groups. Robert A Paul, et al. conducted a study entitled "paediatric regional anaesthesia: comparing caudal anaesthesia and ilioinguinal block for paediatric inguinal herniotomy". They concluded that in both the groups' duration of analgesia was comparable and no significant difference in both groups [15]. Jagannadan N, Sohn L, et al. have conducted a study "unilateral groin surgeries in children: will the addition of ultrasound guided ilioinguinal nerve block enhances the duration of analgesia of single shot caudal block" and found additive block to be effective in inguinal hernia repair patients [16]. Mahin Seyedhejazi, Daryoush Sheikhzadeh, et al. have conducted a study entitled "Comparing the analgesic effect of caudal and ilioinguinal iliohypogastric nerve

blockade using bupivacaine-clonidine in inguinal surgeries in children 2-7yrs old" and found duration of analgesia comparable with p-value being >0.05 without much significant difference in both groups [17]. Abualhassan A. Abdellatif, et al. have conducted a study "ultrasound guided ilioinguinal / iliohypogastric nerve blocks versus caudal block for postoperative analgesia in children undergoing unilateral groin surgery" the following results have been observed The average pain scores during hospital stay were 1.82±1.71and 1.52±1.41 for caudal group and II/IH group respectively (*P*>0.05). The average time to first rescue analgesia was longer in II/IH group 253±102.6 min as compared to 219.6±48.4 min in caudal group. In recovery room, four patients in caudal group required pain rescue medication compared to five patients in II/IH group (*P*>0.05). Similarly eight patients in the caudal group C and six patients in II/IH group required pain rescue medication at day-stay unit or at home (*P*>0.05). Caudal group received 0.74 pain rescue medication doses (range 0-8), while II/IH group received 0.65 pain rescue medication doses (range 0-6) at hospital and at home (*P*>0.05) and concluded that there is no significant difference in duration of analgesia in both the groups. Weintraud, et al. were able to show that the use of the classic landmark-based approach resulted in only 14% of the injections being made at the correct anatomical location [4]. In a prospective randomized study by Willschke and Coworkers the use of an US- guided II/IH nerve block was compared with the landmark-based approach concerning efficacy of the two techniques. It was clearly demonstrated that the use of the US-guided technique was associated with a significantly higher success rate, as evidenced by a reduced hemodynamic reaction to skin incision (4 vs. 24%) and a considerable reduction in the number of patients needing supplemental analgesia in the recovery room (6 vs. 40%) [3]. Fisher, et al. randomly assigned children who underwent orchiopexy to one of three groups at the end of surgery as follows: Caudal block with bupivacaine and 1:200,000 epinephrine (group I); bupivacaine alone (group II) and ilioinguinal/ iliohypogastric nerve block with bupivacaine administered through the wound by the surgeon (group III). They reported no differences in the number of patients without pain for more than 4 hours or those requiring analgesics by 24 hours. Also, the times to micturition did not differ significantly among groups [5].

Quality of analgesia

Quality of analgesia in both the groups is evaluated by FLACC scale and found slight lower scores in ultrasound guided ilioinguinal/ iliohypogastric nerve block when compared to caudal block which was not very significant in terms of p value (>0.05). The following studies have been done: Mahin Seyedhejazi, Daryoush Sheikhzadeh, et al. [17] have conducted a study entitled "Comparing the analgesic effect of caudal and ilioinguinal / iliohypogastric nerve blockade using bupivacaine-clonidine in inguinal surgeries in children 2-7 years old" and found the quality of analgesia slightly more with ilioinguinal group when compared to caudal block group but the difference was not statistically significant· Abualhassan A. Abdellatif, et al. [18] have conducted a study "ultrasound guided ilioingunal/ iliohypogastric nerve blocks versus caudal block for postoperative analgesia in children undergoing unilateral groin surgery" and found slightly improved quality in ilioinguinal group with lower FLACC scale values when compared to caudal block group but the difference in quality between two groups is not significant in terms of p-value (>0.05).

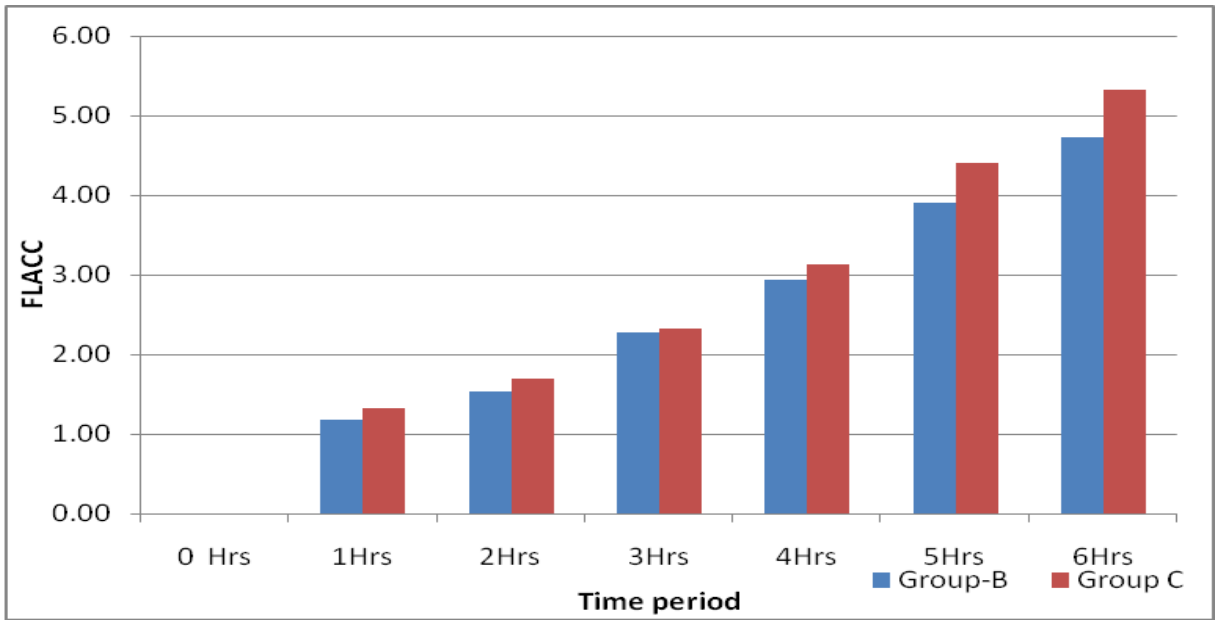
Hemodynamic parameters

Mean arterial pressure and heart rates were recorded in both groups at baseline and intraoperatively at 5, 10, 20, 30 min. and every hourly thereafter. The following observations have been made:

Table - 3: Comparison of intra op MAP (mm of hg) changes between two groups.

M.A.P. in mm of Hg	**Group B**	**Group C**	**P Value**
Duration	**Mean ± SD**	**Mean ± SD**	
Baseline/ Before incision	74 ± 4.8	73.5 ± 6.03	0.9
After incision			
5 min	94.1 ± 4.3	97.7 ± 4.50	0.73
10 min	90.9 ± 4.9	94.1 ± 4.82	0.61
20 min	88.9 ± 5.2	92.1 ± 5.20	0.59
30 min	87.6 ± 5.6	90.5 ± 5.08	0.61
Post-operative			
0 hour	68.4 ± 13.3	69 ± 5.7	0.3
1 hour	66.8 ± 4.8	67.3 ± 4.5	0.6
2 hours	66.4 ± 4.4	66.6 ± 4.5	0.9
3 hours	66.1 ± 5	66.1 ± 4.6	0.9
4 hours	66.9 ± 4.1	66.7 ± 4.5	0.8
5 hours	67.4 ± 4.7	67.1 ± 5.2	0.7
6 hours	67.9 ± 4.2	67.8 ± 4.9	0.9

Figure - 1: Comparison of FLACC scores in two groups.



Mean Arterial Pressure

The mean arterial pressures in two groups have no significant difference and the p-value being (>0.05). Mean arterial pressures were in the average range of 68.5 in whole intraoperative period. This finding is supported by the following studies: Abualhassan A. Abdellatif, et al. [18] have conducted a study "ultrasound guided ilioingunal/ iliohypogastric nerve blocks versus caudal block for postoperative analgesia in children undergoing unilateral groin surgery" and found no significant difference in mean arterial pressure in both groups. Jagannadan N, Sohn L, et al. have conducted a study "unilateral groin surgery in children :will the addition of ultrasound guided ilioinguinal nerve block enhance the duration of analgesia of single shot

caudal block" and have observed intra-operative hemodynamics and found that there is no significant difference in mean arterial pressure in both the groups. In a prospective randomized study by Willschke and co-workers the use of an US- guided II/IH was compared with the landmark-based approach concerning efficacy of the two techniques. It was clearly demonstrated that the use of the US-guided technique was associated with a significantly higher success rate, as evidenced by a reduced hemodynamic reaction to skin incision (4 vs. 24%) and a considerable reduction in the number of patients needing supplemental analgesia in the recovery room (6 vs. 40%) [3].

Table - 4: comparison of mean duration of analgesia in hours in two groups.

Mean duration of analgesia in hours	Group B		Group C		Total	
	No.	%	No.	%	No.	%
4	4	13%	4	13%	8	13%
4.5	5	17%	11	37%	16	27%
5	11	37%	9	30%	20	33%
5.5	10	33%	6	20%	16	27%
Total	30	100%	30	100%	60	100%
Mean ± SD	4.95 ± 0.51		4.78 ± 0.49		4.87 ± 0.5	
Significance	P Value 0.20					

Heart rate

Skin incision is permitted 15min after block in both groups and increase in heart rate increase of more than 20% of baseline is interpreted as failed block. In the other case heart rates have been measured at baseline and every 5min up to 30 min and every hour thereafter. Not much significant difference in heart rates in intraoperative period was observed in both the groups. As the analgesia is waring off in postoperative period increase in heart rates were observed. The above observation is supported by following studies: Abualhassan A. Abdellatif, et al. [18] have conducted a study "ultrasound guided ilioingunal/ iliohypogastric nerve blocks versus caudal block for postoperative analgesia in children undergoing unilateral groin surgery" and found no significant difference in heart rates in both groups. Jagannadan N, Sohn L, et al. have conducted a study "unilateral groin surgeries in children: will the addition of ultrasound guided ilioinguinal nerve block enhance the duration of analgesia of single shot caudal block" and have observed intra-operative hemodynamics and found that there is no significant difference in mean arterial pressure in both the groups. Markham, et al. used cardiovascular response as a surrogate marker for intraoperative pain and found no difference between caudal block and US guided Ilioinguinal/ Iliohypogastric nerve block [2]. Gaitini and co-workers showed that caudal block was more effective than II/IH nerve block in supressing the stress response as reflected by epinephrine and norepinephrine blood levels in groin surgeries, but in present study, both blocks were equally effective in reducing stress response as showed by mean arterial pressure and heart rate changes. In present study it is also observed that the requirement of Local anaesthetic dose is less in US guided Ilioinguinal / iliohypogastric nerve block (0.1 ml/kg body weight) when compared with caudal block (0.7 ml/kg body weight). Willschke and co-workers [3] showed that a substantial reduction in the volume of LA (traditionally recommended volume 0.3-0.5 ml/kg).

Rescue analgesia

Rescue analgesia is given if the FLACC pain scale was 4 or more, rectal Paracetamol 20

mg/kg was administered in both the groups. In present study FLACC Score 4 or more considered as pain, and start for rescue analgesia. There was no significant difference in the requirement of rescue analgesia in both the groups which is supported by the study conducted by Abualhassan A. Abdellatif, et al. [18] where fentanyl 1 mic/kg is given as rescue analgesia. No significant difference in requirement of rescue analgesia is found in both the groups with p-value being 0.659 with mean value in group of caudal block being 16.6% and mean value in ilioinguinal group being 21.74%.

Complication

In present study we have not encountered complications in both study groups. The side effects were not different in both groups in this study. Gofeld M, Christakis M, et al. studied on sonographically guided ilioinguinal nerve block and concluded that his technique is reliable and reproducible. The block is achievable by a low-volume local anesthetic injection. Visualization of the intestines and blood vessels in the abdominal wall may help prevent an inadvertent injury [25]. Polaner, et al. reviewed 737 ilioinguinal/ iliohypogastric nerve blocks, and found one adverse event i.e. positive aspiration. This low morbidity rate was attributed to the widespread use of ultrasound guidance. Polaner et al. reviewed 6011 single shot caudal blocks, and identified 172 (2.9%) adverse events, including 18 positive test doses, five dural punctures, 38 vascular injuries, 71 abandoned blocks and 26 failed blocks.

Conclusion

Ultrasound guided Ilioinguinal / Iliohypogastric nerve blocks is an ideal procedure for unilateral groin surgeries in children, regarding quality of analgesia with less pain scores and duration of analgesia is comparable with that of caudal block, with lower volume of Local Anesthetic.

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