

Research Article**A Post-Operative Pain in Children Undergoing Penile Procedures and
Comparison of Caudal Block versus Penile Nerve Block**¹Anjum Zeeshan, ²Iqra Younas,³Malik Muhammad Umair Fazal and ⁴Nazia Shuaib¹Medical Care Center Lahore, Pakistan²House Officer, Bahawal Victoria Hospital, Bahawalpur, Pakistan.cell: 03366754105.³House Officer, Bahawal Victoria Hospital, Bahawalpur, Pakistan.cell: 03318682681.⁴Nursing Instructor, State College of Nursing, Mirpur, Azad Kashmir.**ABSTRACT**

Background: Surgical procedures are aimed at the pain free interaction with the patient. Before operating the pain-free feeling is very necessary in the pediatric groups of age. Before the act of operation numerous methods are employed to make the interaction pain free, blocking of the nerves is common among these pain relieving techniques. Penile, caudal and inguinal block is the most utilized method of pain relief often used in perineal surgery.

Study Design: Controlled randomized trial.

Place and Duration: Research study commenced from March, 2012 and completed in September, 2012 at the venue of Pakistan Institute of Medical Sciences, Islamabad (PIMS).

Materials & Methods: Subject Clinical Trial of randomized in nature comprised on a total 136 number of male cases. The range of the age was between fifteen days to twelve years. Random division of the total patients was done in an equitable manner. Two groups were made out of a total of 136 patients. Groups were named as Caudal Block and Penile Block groups. To measure the postoperative pain consistency, cry, activity, legs and face was used as pain measurement scale.

Results: In "A" group penile block and "B" group caudal block factor of mean age was 3.2 ± 2.4 and 3.9 ± 2.8 years respectively. In comparison to Group "B", Group "A" had forty-six hypospadias repair cases that equals 67.6 percent of the total population. The same cases were forty-three in "B" group that makes the proportion of 63.2 percent. Circumcision ratio in both the groups was 22.1 and 19.1 percent respectively that equals to 15 and 13 cases in each group. Shorter duration anesthesia was administered in penile group in comparison to caudal group. The rate of anesthesia in penile and caudal groups was 102.1 ± 15.4 minutes and 113.4 ± 11.8 minutes respectively. Pain score was different in both the groups, pain was less in group "A"; whereas, group "B" felt more pain with the p-value less than equal to 0.001.

Conclusion: At the end of research it is affirmed that one dose of penile block is heavier than caudal epidural block for postoperative relieves in the children exposed to various surgeries of penile.

Keywords: Penile Block, Penile Surgery, Postoperative Pain and Caudal Block.

INTERODUCTION

Till present the post-surgical pains have been less discussed or neglected topic, recent developments in the healthcare system has made this perspective important and necessary. Painless surgeries are now very important for the patients, even in the pediatric patients [1]. Numerous nerve blocking methods, analgesics, conventional methods of anesthesia and opioids help in the peri-operative pain relief gadgets for children. Numerous penile surgeries are

made pain free with the method of penile block as it is widely used method in both reconstructive and circumcision's procedures [2]. Furthermore, in the recent developments of dosage, concentration and composition of common anesthetics the mostly utilized anesthesia is caudal specially in the cases of children during the penile procedures for the treatment of hypospadias repair through regional block. Whereas, few issues are attributed to caudal

block after the distal repair of hypospadias. This also depends upon the unimpaired maturation and analgesia dosage especially in the absence of suprapubic catheter [2].

There are numerous findings about the efficacy of these blockades and modalities of anesthetic aids. [3, 4, 5] Penile anesthesia was compared with caudal anesthesia in a research paper in Germany. Research concluded less maturation was significant in penile group in comparison of penile group. The range and measurement of penile over causal anesthesia is as 5/33 VS 15/27 with a significant p-value of 0.05 [2]. A study conducted in India compares general anesthesia with penile blockade and few other differences such as time of first appearance, after surgery pain relives, and statistical significance. It was affirmed that the use of penile block with light-sedation is effective in distal surgeries of penile which last less than two hours in comparison to anesthesia of general nature [6]. Few studies show that there is no difference in the score of pain with the application caudal and penile block. According to Beyaz the penile block and general anesthesia are similar in results during the major impediments of children [7, 8]. Commonly employed regional method is caudal block. In the surgeries of children, it is observed by many experts that penile block has been replaced by caudal block [3, 4]. Reduced side effects and lasting of analgesia are focused in caudal block in numerous research studies. Mahin reports in her studies that pain management is good through the employment of penile block, proportions of pain score of both penile and caudal are respectively 51.2 percent and 27.9 percent [8, 10]. Various comments and reports on both the techniques makes it confusing for the doctors and anesthetists the choice between caudal and penile blocks. Post-operative extended analgesia and ratio of side effect are the major causes in the selection of one technique among two. A trial of randomized and controlled nature was held for the pains of post operation. In the local areas penile block system is applied for the penile surgeries, rationalization of this routine requires evidences.

LITERATURE REVIEW

The nature of research study was Controlled Randomized Trial. Research study lasted for a

period of six months as it started from March, 2012 and completed in September, 2012 at the venue of Pakistan Institute of Medical Sciences, Islamabad (PIMS). Subject Clinical Trial of randomized in nature comprised on a total 136 number of male cases. The range of the age was between fifteen days to twelve years. Random division of the total patients was done in an equitable manner. Two groups were made out of a total of 136 patients. Groups were named as Caudal Block and Penile Block groups. To measure the postoperative pain consistency, cry, activity, legs and face was used as pain measurement scale. Male children of five to twelve years went through the penile operation were selected for the research study after the consent of informed and written nature from caretakers and parents. Approval for the protocols was secured from the Review Committee of Institute. A predesigned form was used for the historical records and data collection such as clinical evaluation and brief history. Patients were detailed in Groups "A & B" after a lottery draw, for the observation of post-operative pain observation was made at the intervals of one, three, six and nine hours by the factors of consistency, cry, activity, legs and face. These factors were used as pain measurement scale. After the act of surgery final evaluation was made at the end of twelfth hour. Post-operative complexities and side effects were also noted for the analgesia in surgery induction. For the data analysis and differentiation SPSS V-11 was used. With the help of Chi-Square test comparisons of variables was made among the variables of penile surgery type, gender and age. With the help of T-Test mean age and pain after operation with respect to duration was also compared. A significant value of p as p-value was observed as <0.05.

RESULTS

In "A" group penile block and "B" group caudal block factor of mean age was 3.2 ± 2.4 and 3.9 ± 2.8 years respectively. Age of the major cases was between one year to five years in both penile and caudal block groups as the ratio of penile block was 76.4 percent and percentage of caudal block was 84.8. Without any statistical difference age

was similar in both the groups as reflected in Table-I.

Table 1: Age of study subjects in the two groups

Mean + SD	3.2 + 2.4		3.9 ± 2.8		0.39
Number	n=60		n=60		
Groups	Group A (Penile Block)		Group B (Caudal Block)		P-Value
Age	Number	Percentage	Number	Percentage	
< 1 Years	9	13.2	8	11.7	0.78
1 to 2 Years	24	35.2	30	44.1	0.38
3 to 5 Years	28	41.2	27	40.7	0.86
> 5 Years	7	10.3	3	4.4	0.74

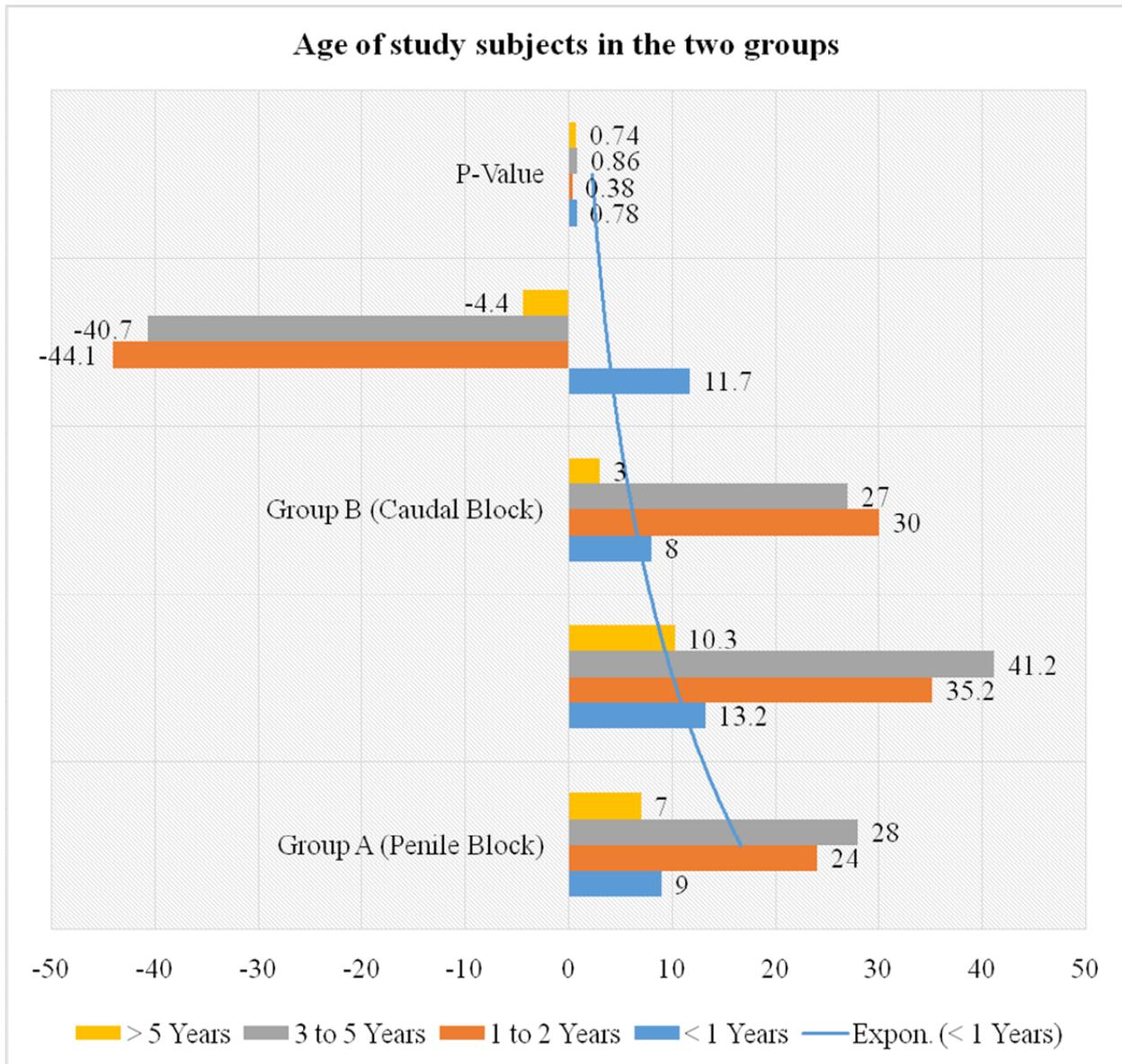


Figure 1. Comparison of mean FLACC pain score between the two groups
 The most frequent penile surgery was hypospadias repair in 46 (67.6%) group A cases and 43 (63.2%) group B cases followed by circumcision in 15 (22.1%) and 13 (19.1%) cases respectively. Further details can be seen in Table II.

Table II: Type of penile surgery done in the study

Groups	Group A (Penile Block)		Group B (Caudal Block)		P-Value
	Number	Percentage	Number	Percentage	
Hypospadias repair	46	-67.60%	43	-63.20%	0.72
Circumcision	15	-22.10%	13	-19.10%	0.83
Meatal stenosis	3	-4.40%	5	-7.30%	0.87
Epicedia	4	-5.80%	5	-7.30%	0.91
Others	0	0.00%	2	-2.90%	0.49

* Difference in proportions was calculated using chi-square test

The rate of anesthesia in penile and caudal groups was 102.1+15.4 minutes and 113.4+11.8 minutes respectively. Pain score was different in both the groups, pain was less in group “A”; whereas, group “B” felt more pain with the p-value less than equal to 0.001. Pain score, observations were made at the intervals of one, three, six and nine hours by the factors of consolability, cry, activity, legs and face. These factors were used as pain measurement scale. After the act of surgery final evaluation was made at the end of twelfth hour. Pain score reading for various time durations is reflected against each in Table-III and Figure placed against the table.

Table III: Comparison of post-operative pain in the two study groups

Time	Group A (Penile Block)	Group B (Caudal Block)	P-Value
One hour	1.5 + 0.4	1.9 + 0.5	0.001
3 hours	1.6 + 0.5	2.8 + 0.9	<0.001
6 hours	1.8 + 0.5	3.9 + 1.5	<0.001
9 hours	2.5 + 0.8	5.4 + 1.6	<0.001
Overall	3.6 + 1.1	5.5 + 1.2	<0.001

* Difference in means calculated using student’s t-test

Rate of bleeding in penile case was observed in one patient that equals 1.5 percent in both the groups. On the other hand, one case of motor block was also observed in the “B” group of cauda block that also represent 1.5 percent of the total.

DISCUSSION

Surgical procedures are aimed at the pain free interaction with the patient. Before operating the pain-free feeling is very necessary in the pediatric groups of age. Before the act of operation numerous methods are employed to make the interaction pain free, blocking of the nerves is common among these pain relieving techniques. Penile, caudal and inguinal block is the most utilized method of pain relief often used in perineal surgery. Research study commenced from March, 2012 and completed in September, 2012 at the venue of Pakistan Institute of Medical Sciences, Islamabad (PIMS). Subject Clinical Trial of randomized in nature comprised on a total 136 number of male cases. The range of the age was between fifteen days to twelve years. Random division of the total patients was done in

an equitable manner. Two groups were made out of a total of 136 patients. Groups were named as Caudal Block and Penile Block groups. To measure the postoperative pain cons liability, cry, activity, legs and face was used as pain measurement scale [9]. Shorter duration anesthesia was administrated in penile group in comparison to caudal group. The rate of anesthesia in penile and caudal groups was 102.1+15.4 minutes and 113.4+11.8 minutes respectively. Pain score was different in both the groups, pain was less in group “A”; whereas, group “B” felt more pain with the p-value less than equal to 0.001. Pain scale of post-operative cases in the penile group was was between 1.2 – 2.5 and in the caudal block ranges from 1.9 – 5.9 for a duration of one to nine hours. Low incidences of the pain of post-operative was associated with penile block

technique. Comparative studies and analysis support these findings. According to Ashrey caudal block is less recommended than penile block for the count of post-operative pain values as measured in the pain scale [10]. For analgesia in the children penile is better than caudal block (Kundra et al. 12). In the findings of other studies such as Metzelder, also advocate the superiority of penile block over caudal block for the distal hypospadias repair in perioperative analgesia [2]. Validation of these studies is confirmed in our research paper as penile block is highly recommended over caudal block for analgesia in children.

There is a slight difference in the administration of both the anesthetics in terms of duration of application. As, shorter duration anesthesia was administered in penile group in comparison to caudal group. The rate of anesthesia in penile and caudal groups was 102.1+15.4 minutes and 113.4+11.8 minutes respectively. According to the findings of Ashrey and his colleagues for the penile and caudal block the duration was 109.6 and 111.2 minutes respectively without any statistical prove it caudal block administration time was slightly more than penile block [10]. Moreover, reports also suggest the twice application of penile block analgesia is even better for post-operative pain controls in comparison to single penile block analgesia application.

Except penile bleeding no other sign of complications like nausea, vomiting and urine retention was observed in the children. Penile bleeding was observed in only one case through the course of the research, that was present in every group. Few side-effects are also associated in various studies regarding caudal block and penile block in post-operative observations [10, 11]. According to Metzelder significant maturation was also less impaired as the count of penile block was 5/33 and caudal block count was 15/27 [2]. Complexities are less in the case of penial analgesia cases when compared to caudal block post-operative cases. Decades of applications reflect the effectivity of penial block over caudal block. Penial block has better controls over the post-operation readings of pain. According to Beyaz the penile block and general anesthesia are similar in results during the major impediments of children [7, 8].

Commonly employed regional method is caudal block. In the surgeries of children, it is observed by many experts that penile block has been replaced by caudal block [3 ,4]. Reduced side effects and lasting of analgesia are focused in caudal block in numerous research studies [12, 13]. Motor and sensory advantages are also associated to penile analgesia and it is recommended over caudal block [14].

Current research study offers many advantages, as there are very few efforts made for the probe of under discussion issue in the children. This study will obviously benefit the anesthetists and pediatrics surgeons'. Sample size was reasonable as it holds 136 cases sub-divided into two equal groups of penile and caudal block categories for the completion of study in a comparative way. This method of sample selection and distribution is the strength of the research study. Long-term effects of penile and caudal block are a limitation of the study. Pain-scale information was collected in post-operative condition for twelve hours. Later readings regarding pain were not included in the research study. Only post-operative pains and cases were targeted for the data collection and analysis. No patient satisfaction grading and peri-operative pains were recorded in the collected facts and data gathering process. Factor of long-term following was also missing in the research.

CONCLUSION

At the end of research, it is affirmed that one doze of penile block is heavier than caudal epidural block for postoperative relieves in the children exposed to various surgeries of penile. Penile blocks have less or no complexities in comparison to caudal block in post-operative conditions. Administration of the penile block is also easier than caudal block. Expertise is mandatory for the application and administration of caudal block in children going through penile surgeries. Surgeons without the help of anesthetists can administrate penile block analgesia. Recommendations are made for even deep and multi-dimensional studies regarding peri-operative and post-operative penial and caudal block.

REFERENCES

1. Cho SH, Kim YR, Lee JH, Kim SH, Chae WS, Jin HC, et al. A questionnaire study investigating the prevalence of chronic postoperative pain. *Korean J Anesthesiology*. 2012; 62(1):40-46
2. Metzelder M L, Kuebler J F, Glucer S, Suempelmann R, Ure B M, Petersen C. Penile block is associated with less urinary retention than caudal anesthesia in distal hypospadias repair in children. *World J Urol*. 2010; 28(1): 87-91.
3. Sakellaris G, Georgogianaki P, Astyrakaki E, Michalakis M, Dede O, Alegakis A, et al. Prevention of post-operative nausea and vomiting in children—a prospective randomized double blind study. *Acta Paediatrica*. 2008 ;97(6):801-4.
4. Seyedhejazi M, Azerfarin R, Kazemi F, Amiri M. Comparing caudal and penile nerve blockade using bupivacaine in hypospadias repair surgeries in children. *Afr J Paediatr Surg* 2011;8(3):294-7
5. Khalid A, Siddiqui SZ, Haider S, Aftab S. Single dose caudal tramadol with bupivacaine and bupivacaine alone in pediatric inguinoscrotal surgeries. *J Coll Physicians Surg Pak*. 2007;17(9):519-22
6. Panda A, Bajwa S J S, Sen S, Parmar S S. Penile block for paediatric urological surgery: A comparative evaluation with general anaesthesia. *Indian J Urol*. 2011; 27(4): 457-64.
7. Beyaz S G. Comparison of postoperative analgesic efficacy of caudal block versus dorsal penile nerve block with levobupivacaine for circumcision in children. *Korean J Pain*. 2011; 24(1): 31-35.
8. Mahin S, Rasoul A, Fahime K, Maryam A. Comparing caudal and penile nerve blockade using bupivacaine in hypospadias repair surgeries in children. *Afr J Ped Surg* 2011; 8(3):294-97
9. Frattali CM. National Institutes of Health, Warren Grant Magnuson Clinical Center. *ASHA*. 1999; 41(4):46-49
10. Ashrey EM, Bosat BE. Single-injection penile block versus caudal block in penile pediatric surgery. *Ain-Shams J Anaesthesiol*. 2014;7(3):428-33
11. Seyedhajazi M, Azerfarin R, Kazemi F, Amiri M. Comparing caudal and penile nerve blockade using bupivacaine in hypospadias repair surgeries in children. *Afr J Paediatric Surg*. 2011;8(3):294-7
12. Kundra P, Yuvaraj K, Agrawal K, Krishnappa S, Kumar LT. Surgical outcome in children undergoing hypospadias repair under caudal epidural vs penile block. *Paediatric Anaesth*. 2012; 22(7):707-712.
13. Chhibber AK, Perkins FM, Rabinowitz R, Vogt AW, Hulbert WC. Penile block timing for postoperative analgesia of hypospadias repair in children. *J Urol*. 1997; 158(3): 1156-9.
14. Wilder RT, Goldschneider KR. Pain Relief After Outpatient Surgery. In *Pain in Children* 2008;101-109). Humana Press.