

A Comparative Study of Penile Block Versus General Anaesthesia in Pediatric Urological Surgeries

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Abstract

Introduction: Surgical pain relief in children can be given by general anaesthesia or by regional nerve blocks. The present study was carried out to evaluate the effectiveness of penile block for penile surgeries with the standard technique of general anaesthesia (GA) of duration of less than two hours, and also to evaluate the postoperative analgesia obtained by penile block.

Objectives of the study: We designed a study in our hospital to compare the effectiveness of penile block for penile surgery with standard technique of general anaesthesia of duration of less than two hours and to evaluate the postoperative analgesia obtained by penile block.

Materials & methods: 60 children between the age of 1 and 10 years belonging to American Society of Anesthesiologists (ASA) grades I and II were included in the present study randomly and divided into two groups of 30 each: Group B and group G. Intra-operatively, HR, ECG, NIBP (systolic and diastolic) and SpO₂ were recorded at 5 minute intervals for the first 60 min and then at 15 minute intervals till the end of procedure. Post operatively, HR, NIBP, SpO₂ and pain were assessed and recorded at 15 minutes, 1 hour, 4 hours and 8 hours. The time to first feed and the first rescue analgesic were also recorded. Any complications or side effects due to the block or GA were also observed and recorded.

Results: None of the patients in group B required any supplemental analgesia. However, all children in this group needed midazolam 0.01 mg/kg to avoid anxiety and to prevent minor movements of limbs. All the children in group G for whom surgery lasted 45 minutes or longer needed additional additional doses of fentanyl (n=10). Post operative heart rate in group G was significantly more than group B at all the four time intervals (P<0.0001). The average time for rescue analgesia was 287.0 ± 54.4 minute in group G while it was 562.0 ± 300 in group B (P<0.001). The mean time to first feed post operatively was 91 ± 49.97 in group G whereas it was 77.5 ± 17.76 minute in group B (P<0.001). There were no complications due to the block such as edema, hematoma or bleeding.

Conclusions: Penile block is very effective when used along with sedation for short (<2 hours) distal penile surgeries when compared to standard GA as reflected by more stable haemodynamics in peri-operative period, excellent pain relief up to 6-8 hrs postoperatively and paucity of any significant complications or side effects.

Key words: General anaesthesia, pediatric urological anaesthesia, penile block, penile surgery

Date of Submission: 04 -10-2017

Date of acceptance: 14-10-2017

I. Introduction

Penile surgeries like circumcision, urethral dilatation and hypospadias repair can be easily done under dorsal nerve of penis blockade. It is easy to perform, safe and effective in most of the cases for relieving the postoperative pain of superficial penile surgery. Dorsal penile nerve blocks alone have been used for circumcision in paediatric patients in several studies. We compared the effectiveness of penile block for penile surgery with general anaesthesia of duration less than two hours and evaluated the postoperative analgesia obtained by penile block.

II. Aims And Objectives

To compare the effectiveness of penile block for penile surgery with general anaesthesia of duration less than two hours and also to evaluate the postoperative analgesia obtained by penile block.

III. Methodology

Type of study : Prospective study
Duration of study : February 2014 to February 2016
Sample size : 60
Setting : Department of Urology, Govt. Royapettah Hospital Hospital, Chennai.

Inclusion Criteria:

Sixty children between the age of 1-10 years belonging to American Society of Anesthesiologists (ASA) grades I and II were enrolled in the present study

Exclusion criteria:

- All patients who refused to give consent.
- Adults
- Non penile surgeries
- Allergic to local anaesthetic agents

Procedure

The study was conducted after the approval of the protocol by the Hospital Ethics Committee and obtaining a well informed consent from the parents. Sixty children between the age of 1-10 years undergoing penile surgeries and belonging to American Society of Anesthesiologists (ASA) grades I and II were selected. They were allotted to two groups. Randomization was carried out with the help of computer generated envelopes. Group B received a penile block, whereas group G children received general anaesthesia. Both groups received ketamine 0.5-1.0 mg/kg and atropine 0.02 mg/kg intravenously, 15 minutes before surgery as pre medication. The effect of the ketamine lasted for around 15-20 minutes in the children who were administered isolated local block. Baseline parameters like non invasive blood pressure monitoring (NIBP), pulse oximetry (SpO₂), heart rate (HR) and electrocardiogram (ECG) were recorded. Intra-operatively, HR, ECG, NIBP (systolic and diastolic) and SpO₂ were recorded at 5 minute intervals for the first 60 min and then at 15 minute intervals till the end of procedure. The time to first feed and the first rescue analgesic were recorded. Any complications or side effects due to the block or GA were also recorded. We performed statistical analysis of the data obtained using the Fisher exact and Pearson chi-square test to determine associations among the three groups. Sensitivity, Specificity, Positive predictive value (PPV), Negative predictive value (NPV) of the three methods were calculated.

IV. Results

The study was done on 30 patients in group B and 30 patients in group G. The mean age, weight, Hemoglobin (Hb) and duration of surgery in group B was comparable to the mean age, weight, Hb and duration of surgery in group G and statistically non significant. The comparison of mean intra-operative HR at various time intervals in the two groups shows higher variations in group G as compared to group B. Intra operative fluctuations in mean arterial blood pressure at various time intervals in the two groups showed statistically significant higher values in group G than in group B. None of the patients in group B required additional local anaesthetic or pain relievers. However, all children in this group had to be given midazolam 0.01 mg/kg to allay anxiety and to avoid minor movements of limbs. The mean time to first feed post operatively was 91 ± 49.97 in group G whereas it was 77.5 ± 17.76 minute in group B (P<0.001) (Table-1). No child in either group suffered from any drowsiness, restlessness or respiratory depression. The children undergoing surgery under GA (group G) had a steady depth of anaesthesia as evident by the absence of tears or sweating during the course of the surgery. Due to the nature of the surgery, many of the patients were catheterized pre operatively. Hence, incidence of urinary retention was not studied. However, all the other children voided of their own and post operative catheterization of the bladder was not required for any patient in either of the groups.

Table 1- Time of first oral intake and rescue analgesia

	Group G (Mean ± SD)	Group B (Mean ± SD)	P value
Time of intake of first food	287 ± 54.40	77.5 ± 17.65	<0.001
Time of first rescue analgesia	91 ± 49.97	562 ± 300	<0.001

V. Discussion

The advantages of regional anaesthesia include a decreased requirement of general anaesthesia allowing early extubation and providing long lasting analgesia extending well into the post operative period.(1),(2) Paediatric penile surgeries are usually superficial ; however, the post operative pain they cause can traumatize the child psychologically. Parenteral narcotics or topical analgesia do not always provide sufficient analgesia, and caudal blocks with the possibility of motor blockade of lower limbs appear to be controversial for minor surgeries.(3),(4) Although, in the present study, the majority of cases were for circumcision and hypospadias repair, there were other surgical indications too. Several earlier studies have evaluated the efficacy of penile block given under GA. (5),(6)In the present study, we were able to administer the block under sedation with ketamine. Hence the block was easy to perform and there were no technical difficulties while giving the block. Most of the children did not move significantly during this step; however, some had reactive abdominal muscle contraction, and mild flexion of the lower limbs. In the earlier studies not much significance was given to the comparison of vital signs such as heart rate, respiratory rate, pulse oximetry, etc but only pain scores were studied. The pain scores were almost similar to earlier studies but the comparison of vital signs could not be performed due to paucity of data. Intra operatively, it was noted that the heart rate and mean arterial pressure in group G remained significantly higher than in group B. At most of the time intervals, this observation could be explained either as a stress response to anaesthesia and surgery or intra operative pain. Premedication with ketamine also could have been a contributing factor.

The pain score was significantly higher in group G at 15 min and 1 hour after surgery with 14 patients reporting 75% pain and 5 and 7 patients reporting 100% pain at these intervals, respectively. This value decreased steadily after rescue analgesics that were given mostly in the period of 15 minute to 1 hour post operatively. In group B the longest pain free period is 24 hours where as the shortest one is 1 hour. Most of the children had oral intake earliest at 1 hour and latest by 2 hours. The incidence of nausea and vomiting was remarkably low in our study (only 2 in group G and none in group B). No block related complications like bleeding, hematoma or edema were noted in group B patients. Dorsal penile nerve blocks are easy to perform, occasional failures are usually due to technical difficulties.(7)Few minor complications like bleeding, hematoma and minor bruising have been reported.(8) There was no such complication in our study. A slow rate of injection taking 1-2 minutes avoided pain to the children while giving the block is suggested in a study by Serour et al.(9)

VI. Conclusions

The use of dorsal penile nerve block under sedation avoids general anaesthesia with its associated risks of laryngospasm, oxygen desaturation, post extubation sore throat, nausea and vomiting. The block provided good intra operative and post operative analgesia for superficial penile surgeries in children. Penile blocks prove to be more effective for these surgeries than standard GA as reflected by more stable haemodynamics in peri operative period, excellent pain relief extending up to 6-8 hours post operatively, and absence of any significant complications and side effects. The post operative analgesia offered by the penile block allowed for early recovery of children.

References

- [1]. Yaster M, Maxwell LG. Paediatric regional anaesthesia. *Anaesthesiology* 1989;70:324-38.
- [2]. Bajwa SJ, Kaur J, Bajwa SK, Bakshi G, Singh K, Panda A. Caudal ropivacaine-clonidine: A better post-operative analgesic approach. *Indian J Anaesth* 2010;54:226- 30.
- [3]. Martin LVH: Post operative analgesia after circumcision in children. *Anaesth Analg* 1982;54:1263-6.
- [4]. Tree-Trakarn T, Pirayavaraporn S, Lerakyamane J. Topical analgesia for relief of post-circumcision pain. *Anaesthesiology* 1987;67:395-9.
- [5]. James TK, Loon K. Penile block for pain relief after circumcision in children: A randomized, prospective trial. *Amer J Surg* 1984;147:797.
- [6]. Ishigooka M, Yaguchi H, Hashimoto T, Hayami S, Sasagawa I, Nakada T, et al. Masciello AL. Anesthesia for neonatal circumcision: Local anesthesia is better than dorsal penile nerve block. *Obst Gynec* 1990;75:834.
- [7]. Stang HJ, Gunnar MR, Snellman L, Condon LM, Kstenbaum R. Local anaesthetic for neonatal circumcision. Effects on distress and cortisol response. *JAMA* 1988;259:1507-11.
- [8]. Serour F, Mandelberg A, Mori J. Slow injection of local anaesthetic will decrease pain during dorsal penile nerve block. *Acta Anaesth Scand* 1998;42:926-8.

Danny Darlington C & Dr. Raju S, "A Comparative Study of Penile Block Versus General Anaesthesia in Pediatric Urological Surgeries." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)* , vol. 16, no. 10, 2017, pp. 75–77.