Original Research Article

Comparison of caudal block vs. penile block in terms of surgical incision response for circumcision and postoperative analgesia requirements.

Abstract:

Circumcision is a frequently performed surgery in children worldwide. For circumcision, penile and caudal epidural blocks are commonly used. Nerves blocks not only decrease in the systemic analgesia requirements intra-operatively but also increase the length of pain relief postoperatively. The aim of the present study was to compare the surgical incision response in circumcision, in children with a caudal block and penile block. We also compared the systemic analgesic requirements postoperatively in both groups.

Materials and methods: The study was conducted in pediatric patients. Total of 30 samples (n= 30) was taken and divided into two groups of 15 each. The group A received caudal block and group B received penile block. The blocks were performed after general anesthesia. We tried our best to eliminate all the factors which could lead tachaecardia (such as hypoxia, light plane of anesthesia, hyperthermia and hypothermia, hypercarbia, hypovolemia etc). The patients were keenly observed for change in heart rate on incision, the heart rates were recorded before and at incision (surgical incision response) in both the groups. The postoperative responses for the use of postoperative analgesics were also studied. These patients were under observation in daycare for 12 hours.

Results: The study proposed that the patients (group 1) with caudal block did not show any significant surgical response, whereas in group 2 patients with penile block showed increased heart rate at the incision. In a group, A patient doesn't complain about any postoperative pain and do not require any analgesic, but in group B most of the patients complained about post-operative pain and required analgesics.

Concluding: On concluding the present study it can be said that caudal block was found superior then penile block.

Keywords: Caudal block, penile block, comparative study, circumcision, pediatric study, clinical study.

Introduction:

Circumcision is a procedure in which there is surgical removal of the skin covering the tip of the penis. Males are usually born with a hood of skin called the foreskin covering the glans penis. Circumcision originated about 15,000 years ago being performed for religious, ritualistic and cultural reasons and it was not until the Nineteenth century that the procedure was ‘‘Medicalised’’[1]. There are also many medical relative indications for circumcision, including the prevention of penile and cervical cancer, the prevention of sexually transmitted infection and prevention of urinary tract infection[1]. It is known from a few earlier studies that the patients with both the caudal and penile block showed the equal requirement of postoperative analgesics. Few others reported penile block to be better than the caudal block. Deflating the earlier studies here we are proposing our hypothesis that the caudal block in superior to penile block. Our aim to conduct the study was to collect clinical data in support of our hypothesis, as it can be said on keenly observing the pediatric patients for a very long time, the author found the caudal block to be superior then penile block.

Methods:

Before conducting the study ethical approval was taken from the institutional ethical committee, South Tipperary General Hospital Clonmel, Co Tipperary, Republic of Ireland. Total of 30 patients was taken. All the patients were between the age group of 3 to 9 years and their weight was 13 to 26 kg. These patients visited the South Tipperary General Hospital Clonmel, Co Tipperary, Republic of Ireland. The total time duration of the study was of 4 months, all the possible precautions were taken during the study. No patients were harmed or injured during the study. All the circumcisions were performed by expert surgeons, in the presence of an anesthesiologist, with the proper concern of the parents and the surgery was performed only according to the will and wish of the parents.

The total sample size split into two groups of 15 patients each. After anesthesia with LMA caudal block was performed in one group and another group received the penile block. Local

anesthesia was calculated on the basis of actual body weight, 0.5ml/ kg b.w was given. Local anesthetic used was cirocane 0.5%. Variable used for pain during the study were heart rate. Pre-incision heart rates and heart rate at the time of incision were recorded. Level of CO2, O2, MAC (anesthetic vapors), temperature regulated within the physiological range. The children with infection in the lower back and around the perineal area, with spinal deformities, history of allergy due to local anesthetics and children above 15 years were excluded from the study.

Statistical analysis: The SPSS 12.0 software program was used for statistical analysis. Data are presented as the mean ±standard deviation (SD). The Mann-Whitney U test was used for comparison of the two groups. The Friedman test was performed for repeated measurements at consecutive time intervals.

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Declaration of interest: We don't have any conflict of interest

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Results:

The patients undergone penile block showed major increment in the heart rate during circumcision as compared to pre incision heart rate of the patients, whereas the patients received caudal block showed a minute or negligible increment in the heart rates of the patients on the incision, as compared to that in pre-incision (graph 1).

Another considerable factor studied was a number of patients receiving postoperative analgesics. In group A (patients with caudal block) requirement of postoperative analgesics was negligible. It can also be seen that no patients complained about any kind of pain after circumcision. Whereas in group B (patients with penile block) postoperative analgesics were required or it can be seen that patients with penile block complained about pain, hence analgesics were provided and the parents were also unhappy (table 1).

Graph 2 is showing pre incision heart rate, heart rate at the time of surgical incision and changes in heart rate in both the groups. Whereas group B with penile block showed increased heart rate with major variations. Where the P value of heart rate at the time of incision is 0.0005, which is

highly significant. Hence graph 2 and table 1 infers, that caudal block is better for analgesia then penile block in pediatric circumcision. Because less increment in heart rate indicates less pain during circumcision in pediatric patients. These results were proved by table 1 where postoperative analgesics were not required in the caudal block.

Discussion:

Secular circumcision is helpful for the decreased probability of sexually transmitted infections and urinary tract infections, it is a common practice in the United States[2]. The medical benefits are reflected in the large prevalence of the procedure. In 2012, it was studied that circumcision was performed 13.9 times more often than the second most common pediatric surgery, appendectomy by the Agency for Healthcare Research and Quality reported that hospitalization[3]. Despite the high rates of prevalence of circumcision, postoperative pain management remains a major concern, a variety of analgesics has rendered the determination of a superior anesthetic[4,5,6,7,8,9,10,11].

Analgesic techniques in circumcision include oral sucrose, topical anesthetic, systemic non-steroidal anti-inflammatory drugs (NSAIDs) or opioids, and regional anesthesia [8,9,10,11]. Non-pharmacological interventions like oral sucrose reduce the duration of cry during circumcision in children less than one year, but appear suboptimal to other anesthetics, as solitary use of oral sucrose is insufficient in treating surgical pain[8,9,11]. Regional anesthetics, in comparison to topical anesthetic and systemic NSAIDs and opioids, offer more optimal. Serbulent GB., 2011, Allan MC., 2008 proposed a study and found the penile and caudal block to be equally effective for circumcision[12,13]. Many researchers published their study in support of penile block and few found both the techniques to be equally beneficial for circumcision, but we found that caudal block is safer for circumcision then penile block.

In this study, we compared the efficacy of DPNB and caudal block for circumcision cases under general anesthesia. Postoperative analgesic efficacy and supplementary analgesic needs of DPNB and caudal block were found and they were not similar. The ideal method of postoperative analgesia after circumcision requires very low complication rates and high success rates. When changes in the heart rates were studied before and at the time of circumcision, on

stabilizing all the other factors responsible for the increase in heart rate except pain. Significant increments in heart rates were found in patients with the penile block as seen in graph 2. Here an increase in heart rate is directly proportional to the increase in pain. Whereas the patients with caudal block did not show any considerable change in heart rate, it indicates less or no pain (graph 2). Postoperative analgesics were also not required in patients receiving a caudal block as shown in table 1.

The advantage of the study is that it can draw a clear pattern in future for surgical incision in the case of circumcision and strongly suggest caudal block over penile block, so that the patients may get better treatment with least pain, and without any postoperative analgesics. The study also has few limitations, although all other factors were tried to be stabilized such as hypoxia, hypothermia, hyperthermia, hypovolemia and low CO_2 level (hypocarbia), which can cause any alteration in heart rate, then also few in cases we failed but in most of the cases, we succeed to stabilize all these factors. The cases we failed to stabilize these factors were excluded from the study.

Conclusion:

On concluding caudal block and penile block regional anesthesia performed for circumcision yielded better results with the caudal block. Caudal block demonstrated a better analgesic effect. Results of this study suggest caudal block is a preferred technique compared to penile block in children undergoing circumcision in term of diffuse and effective pain relief.

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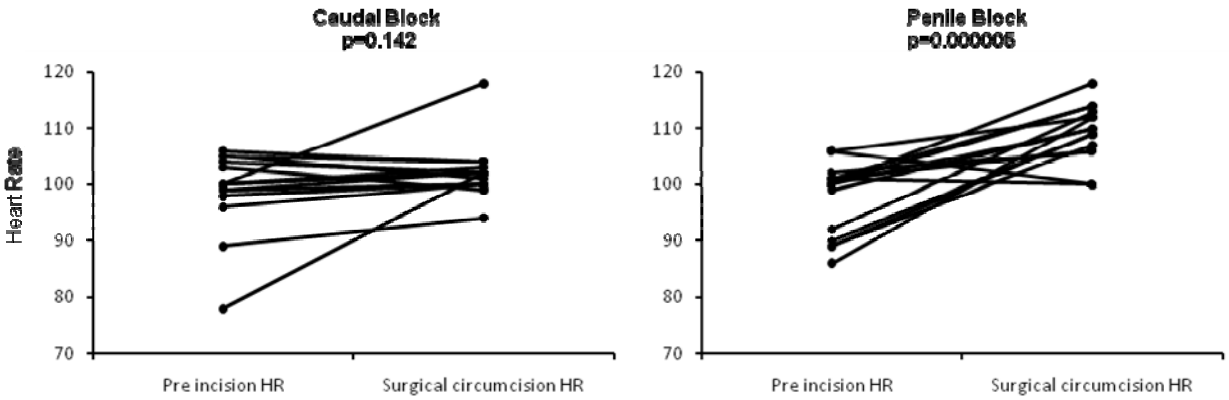
Tables:

Table1 Showing data of patients with respect to age (mean), caudal block, penile block and patients receiving post operative analgesics.

S no.	Age in years (mean)	Caudal block (%)	Penile block (%)	Requirement of Post operative analgesic	
				Caudal block	Penile block
1	3	50	50	No	Yes
2	4	50	50	No	Yes
3	5	50	50	No	Yes
4	6	50	50	No	Yes
5	7	100	0	No	Yes
6	8	50	50	No	Yes
7	9	100	0	No	Yes

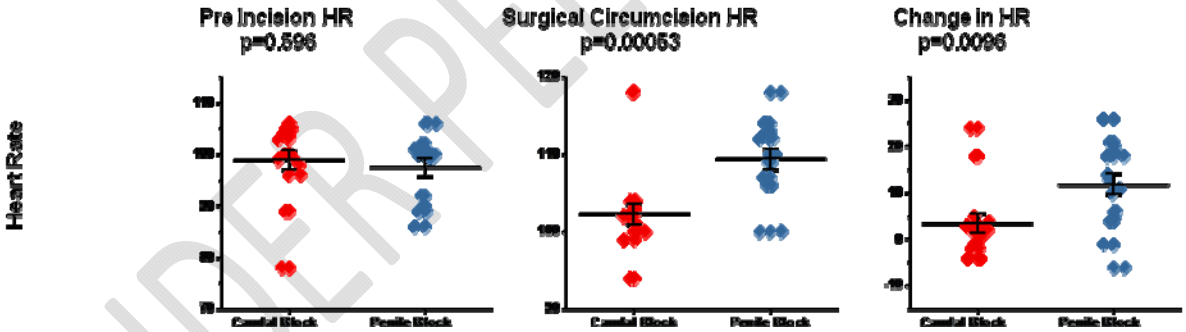
The table is showing average age of the pediatrics patients, the patients undergone caudal and penile block respectively and requirement of post operative analgesics in both the groups. It was seen that patients undergone caudal block do not require any post operative analgesic, where as patients with penile block require post operative analgesics.

Graph 1.



Showing comparision of heart beats before the incision and at the time of incision. Where group A (caudal block) showing least deviation in the heart rate of the patietns, where as in group B (penile block) showing major deviation in heart rate before incision and at the time of ciucumcision.

Graph 2.



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