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ORIGINAL ARTICLE

A Comparative Study on Caudal Bupivacaine with and without Tramadol for Analgesia Postoperatively in Paediatric Inguino Scrotal Surgeries

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ABSTRACT

Objective: The objective of this analysis was to govern the analgesic effect of tramadol with caudal bupivacaine in children enduring inguinal-scrotal surgery postoperatively.

Study design: A Quasi experimental study.

Methods: In this comparative and double-blind study, 120 children undergoing inguinal scrotal surgery were involved in the analysis. They were 2-12 years old. The inclusion standards were children from ASA I and II. The two identical groups were formed. After initiation of general anesthesia, group A patients (n = 60) 0.25% bupivacaine 0.75 ml / kg was administered and tramadol 1 mg / kg with 0.25% bupivacaine 0.75 ml / kg were administered in B group (n = 60). Postoperative pain was evaluated with a visual analogue pain score in 6-7 years of age children and with behavioural reflexion in pre-speech children. Using a 4-point sedation scale; Sedation was assessed; heart rate, mean arterial pressure, arterial oxygen saturation and respiration rate. The sedation and pain were documented at consistent duration up to 24 hours after surgery immediately after recovery from anesthesia. If the pain score was higher than 4, paracetamol (20 mg / kg) was administered rectally.

Results: Addition of intravenous bupivacaine and tramadol suggestively have longer postoperative analgesia (10.1 ± 2.1 hours) in group B, while the mean duration of analgesia (2.90 ± 0.79 hours) in group A, where bupivacaine alone was, provided. No significant changes were observed in blood pressure, O2 saturation and heart rate between groups. Apart from vomiting and nausea, no side effects like retention of urine, depression and pruritus were observed.

Conclusion: In children undergoing inguinal scrotal surgery, caudal bupivacaine and tramadol have more lasting and better postoperative analgesia than bupivacaine alone.

Keywords: Postoperative analgesia, tramadol, Caudal and bupivacaine.

INTRODUCTION

Caudal epidural block is extensively used to treat pain postoperatively in children. The caudal route postoperative pain control route is the most satisfactory and appropriate analgesia in young children enduring perineal, groin, and genital surgery[1-2]. It is frequently given by injection of bupivacaine, a long-acting local anaesthetic. Lack of proper cooperation in paediatric patients causes the caudal block to be achieved under GA or deep sedation[3-4]. The caudal block decreases the anesthesia required time, provides faster and easier recovery, shortens the time consumed in the regaining room, reduces the probable side effects of deep anesthesia, and the necessity for postoperative anesthesia[5-6]. The bupivacaine extreme effect of analgesia is up to 6-13 hours. Various combinations are given to lengthen the analgesic effect[7]. The usage of caudal morphine has a durable analgesic effect, but has grave side effects such as nausea, respiratory depression, urinary retention and vomiting. In this regard, there was some interest in ketamine, an anaesthetic agent with unusual pharmacological characteristics that provides significant analgesia at doses without causing respiratory depression[8-9]. Further compounds such as clonidine, midazolam and tramadol were used in addition to bupivacaine for caudal anesthesia. All offer better analgesia without grave side effects. Pharmacologically, tramadol is a codeine 4-phenylpiperidine synthetic analogue without adverse effects on the respiratory system[10]. Tramadol acts centrally as an analgesic that has less opioid receptors binding affinity and is approximately 5 to 10 times weaker than morphine as a palliative. Its analgesic power is like to that of pethidine delivers long-lasting and effective analgesia after epidural administration in children and adults[11]. The objective of this analysis was to govern the analgesic effect of tramadol with caudal bupivacaine in children enduring inguinal-scrotal surgery postoperatively.

MATERIAL AND METHODS

In this comparative and double-blind study, 120 children undergoing inguinal scrotum surgery were involved in the analysis. The study was approved from the hospital ethical review board and informed consent was taken The participants were 2-12 years old. The inclusion standards were children from ASA I and II. (Table 1). Active infection processes such as sacral pressure ulcers, obesity, haemorrhagic diathesis, neurological disorders, active CNS disease, anticoagulant therapy, sacrum abnormalities, epileptic seizures and increased intracranial pressure were con0sidered as exclusion criteria. There was no prodrug. Vascular access was obtained with 22G cannulation. Patients were induced with propofol 2 mg / kg or sevoflurane 3-4 % and No2 and oxygen was maintained. Then the insertion of laryngeal mask airway device was done to inflate the lungs manually and leakage was carefully investigated. The subjects were placed carefully on the left lateral side with both legs flexed 90 degrees at the knee and hip joints. Afterward performing all the aseptic protections, the sacral hiatus was determined by touching the sacral cornua, and 23-guage short bevel needle with a 90-degree angle was inserted until a pop was felt and sacral hiatus assess was done with needle entering in cephalic route. After negative aspiration for blood and CSF and confirming epidural space by whoosh test , the drug was injected into the epidural space. Afterward general anesthesia induction, group A patients (n = 60) 0.25% bupivacaine 0.75 ml / kg was administered and 1 mg / kg tramadol with 0.25% bupivacaine 0.75 ml / kg were administered in B group (n = 60). The patient was transferred to a supine position and a surgical incision was made 15 minutes later. Sao2, heart rate and blood pressure were restrained every five-minutes in all patients during surgery. Postoperatively; heart rate, respiration rate and BP were documented at 24-hour intervals. The subjects were also assessed for motor block. The length of the operation and the features of all subjects were documented on the proforma. There was no significant difference in recovery after general anesthesia in both groups. The time required to spontaneously open the eyes and move the foot spontaneously was recorded. Sedation was assessed using a simple objective scoring system 30 mints after entering the recovery room and 4 hrs after operation (spontaneous eye opening = 1, opening of eyes in retort to verbal response = 2),

physical stimulus response = 3, No response = 4). Postoperative pain was evaluated with a visual analogue pain score in 6-7 years of age children and with behavioural reflexion in pre-speech children. On a VAS, the patient specifies pain intensity by marking a 10 cm line.

It is evaluated from the point where there is not any pain to the point where the patient repots pains on scale and then given as a numerical value (0 = painless to 10 cm = worst point of pain). Zero score means not any pain and 10 means the severe pain. In preverbal children, paternities detected 5 characteristics of behaviour in children. Kids who laughed and played got one point, children who were happy scored two points, three neutrals, those who cried and suffered scored four points, and children with no distraction scored five points. The analgesia duration was considered as the time between the caudal block and the first rescue analgesia. When the pain score reached 4, paracetamol (20 mg / kg) was administered rectally. Sedation was assessed immediately after surgery and then after 1, 2, 3, 4, 6, 12 and 24 hours with a score of 4. The degree of pain was noted by the anaesthetist on duty who was blinded by the prescribed medication. No patients showed motor block at the time of recovery after anesthesia. All patients remained in the hospital with their parents for at least 24 hours after surgery. Parents' observations and feedback on the child's sleep and comfort were recorded. There was no substantial alteration among the groups in terms of end time of anesthesia to spontaneous opening of eyes. None of the children needed catheterization of bladder.

Statistical analysis was done with SPSS 21.0. Descriptive analyses were performed by comparing groups A and B. All outcomes were articulated as mean SD. T-test was accomplished for variables which are continuous and chi-square test was performed for variables which are stratified. P <0.05 was taken significant.

RESULTS

Patients were divided into two equal groups. The weight, median age, Physical condition, gender distribution and operation time were comparable (Table 1).

Table 1: The clinical and Demographic features of the patients

Variables	Group A (n=60) Mean ±SD, bupivacaine 0.75 ml	Group B (n=60) Mean ± SD, tramadol with bupivacaine 0.75 ml
Age (years)	7.1 ± 2.5	6.1 ± 2.1
Weight (kilograms)	14.8±5.1	17.21±5.20
Gender Male	49 (81.7 %)	46 (76.7%)
Female	11 (18.3%)	14(23.3 %)
ASA	1 & II	1 & II
Duration of surgery(minutes)	30.4±5.0	27.1±5.2
Intraoperative I/v analgesics	none	none

There was no difference in reference point heart rate, respiration rate and SaO2 among the 2 groups. Various types of inguinal-scrotal surgery include urethroplasty, herniorrhaphy and orchidopexy were done among patients. There was no case of caudal epidural block failure. The mean duration of analgesia measured by the time required to obtain a pain score was 2.90 ± 0.79 hours in group A and 10.1 ± 2.1 hours in group B. Addition of tramadol to caudal bupivacaine increased the analgesia duration postoperatively. (p< 0.0005) (Table 2).

No significant changes were observed in blood pressure, oxygen saturation and heart rate between the 2 groups. Apart from vomiting and nausea, no side effects such as pruritus, urinary retention and depression were observed. There was no substantial change in sedation score amongst the two groups because all subjects were active and awake after surgery. The period from the cessation of anesthesia to the spontaneous opening of the eyes to waking up, the spontaneous movement of the legs and the time to the first urination were similar. The 2 patients have vomiting in the bupivacaine-tramadol group, while only bupivacaine group has 3 patients with vomitting postoperatively and intravenous chlorpheniramine was administered to treat (Table 2).

Table 2: Comparison between group A and Group B for complications and post operative analgesia

Variables	Group A (n=60) Mean ±SD, bupivacaine 0.75 ml	Group B (n=60) Mean ± SD, tramadol with bupivacaine 0.75 ml	P value
Duration of analgesia (Hours)	2.90 ± 0.79	10.1 ± 2.1	
Time to spontaneous eye opening (minutes) Sedation score at 30 minutes Respiratory rate (Breaths/min)	9.7±4.1 1 20.2±1.7	10.7±2.2 1 22.5±4.5	P<0.0005
Time to spontaneous leg movements (Minutes)	16.1±4.9	14.1±3.68	
Time to micturition (Hours)	2.9±0.88	3.20±0.8	
Postoperative nausea and vomiting	3	2	

DISCUSSION

Postoperative analgesia, administered caudally, is now widely used in children undergoing genital surgery[12-13]. A long-acting local bupivacaine anaesthetic, is used for of its extended period of action, meaning it can last up to 6 to 12 hours. The caudal block is widely accepted due to its technical simplicity, safety, reliability and fast operation in a wide range of children and infants. The pharmacodynamic and pharmacokinetic properties of bupivacaine have been assessed in hundreds of studies over thirty years[14-15]. Caudal bupivacaine solitarily can produce outstanding analgesic effects in the initial period after surgery. When bupivacaine is used alone for caudal epidural anesthesia, after the effects of block is wears of, emergency analgesics are needed. Recently, various bupivacaine supplements have been used in many paediatric surgeries to increase the duration and quality of pain relief. Addition of tramadol to bupivacaine resulted in a dose-dependent upsurge in analgesia postoperatively[16-17]. This study showed a clinically and statistically substantial period of postoperatively pain reduction. In our study, the postoperative pain reduction period was significantly increased when tramadol was used in addition to local anesthesia with bupivacaine[18-19]. Prosser et al stated that the adding of 2 mg / kg tramadol to caudal bupivacaine resulted in an prolong duration of anesthesia. The tramadol addition did not significantly lengthen the effect of caudal bupivacaine[20-21]. Young age, administration of different concentrations of intravenous inhalations, and the use of different methods of pain assessment and sedation may explain differences in the total dose of analgesia prescribed in different studies. In our study, sedation and pain scores were lower significantly in the group of tramadol in comparison with the group of bupivacaine during the 24-hour study period[22-23]. Large-scale multicentre analysis has shown that caudal block is a safe technique that provides outstanding postoperative pain relief deprived of any problems[24].

CONCLUSION

Based on our research, it can be concluded that the addition of 0.25% bupivacaine and 1 mg / kg tramadol provides long-term and safe analgesia in caudal block than 0.25% bupivacaine alone

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