



DEXAMETHASONE AS AN ADJUVANT IN CAUDAL BLOCKS FOR PAEDIATRIC PATIENTS UNDERGOING HERNIA REPAIR SURGERIES.

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ABSTRACT

Background : Caudal block is the anesthesia of choice for lower abdominal surgeries in paediatric patients. The effect of single bolus caudal block can be prolonged by adding adjuvant. We study the effect of dexamethasone as an adjuvant in caudal block in paediatric hernia repair surgery.

Methodology: 80 patients of age 1-6 years, scheduled for hernia repair surgeries under caudal block were randomly divided into two equal groups. In Group BS (n=40) caudal block was given with bupivacaine 0.25% 1ml/kg + 1ml saline and in Group BD bupivacaine 0.25% 1ml/kg + 0.1mg/kg dexamethasone was used. Duration of analgesia, rescue analgesia requirement in 24 hours and side effects were recorded.

Results: Duration of postoperative analgesia in Group BD versus Group BS (731.25±67.41 vs 215.50±35.94 min, p<0.05). Requirement of rescue analgesic was less in group BD.

Conclusion: Dexamethasone as an adjuvant to local anaesthetic in caudal block is effective in prolongation of analgesia and decreases requirement of rescue analgesia has no postoperative complications.

KEYWORDS : caudal block, adjuvant, dexamethasone, hernia repair surgery.

Introduction

Caudal block is an excellent option of regional anaesthesia for paediatric patients undergoing lower abdominal surgeries. It is widely used all over the world.[1] It is technically simple and it has high success rate. The only limitation of single injection bolus caudal block is limited period of analgesia.[2] Postoperative pain control in paediatric patient is very important as it decreases the morbidity and hastens the recovery of the patient. Continuous epidural catheters are used for extending duration of analgesia but its cost and chances of fecal contamination restrict its use. Other options include addition of adjuvants. Number of adjuvants to local anaesthetics have been studied in various routes and have proven to prolong the analgesic period. Opioids, NSAIDs, ketamine, alpha agonist clonidine and dexmedetomidine have been proven to prolong the duration of analgesia, but they are associated with side effects like nausea, vomiting, respiratory depression, hypotension, bradycardia, pruritis and urinary retention.[3-5] In this study we are evaluating the effect of dexamethasone when added to local anaesthetics in caudal blocks for paediatric patients undergoing hernia repair surgeries.

Objective

The objective of our study is to evaluate the effect of dexamethasone in caudal block for hernia repair surgeries in paediatric patients in terms of prolongation of duration of analgesia, requirement of rescue analgesia and any side effects.

Methodology

The study was carried out in JK Hospital and LN Medical College during the period of September 2016 to February 2017. Eighty patients of age 1 year to 6 years belonging to ASA grade I and II scheduled for hernia repair surgeries were included in the study. Exclusion criteria were any congenital sacral deformity, coagulopathy, hypersensitivity to local anaesthetic agent and infection at sacral region.

Approval of ethics committee was obtained and written informed consent was taken. Patients were randomly divided into two groups containing 40 patients each. One is group BS in whom caudal block was performed using bupivacaine (Bupicain™) 0.25% 1ml/kg + 1ml saline and in the other group BD in whom caudal block was performed using bupivacaine (Bupicain™) 0.25% 1ml/kg + 0.1mg/kg

injection dexamethasone.

Method of randomization of patients was sealed envelope technique. Drugs were prepared and labelled by resident of the department who was not a part of study. Patient proforma were filled by resident posted in OT, who was also not a part of study.

Premedication was done with injection glycopyrrolate 0.01mg/kg and inj midazolam 0.05mg/kg iv. Patients were taken in the OT and basic monitoring ECG, SPO₂, NIBP, HR were connected (Schillers TruScope II Monitor). Anaesthesia was induced by injection ketamine 2mg/kg thereafter caudal block was performed in lateral decubitus position by using 22 gauge 5 cm hypodermic needle under full aseptic precautions. After confirmation of needle in epidural space, negative aspiration for blood and cerebrospinal fluid was performed and then study drug was slowly injected. Anaesthesia was maintained with isoflurane, O₂ 50% and N₂O 50%. Spontaneous respiration was maintained using Jackson Rees circuit. Continuous monitoring of vitals were done. HR, RR, SPO₂ and NIBP were recorded at different intervals like before and after pre-medication, induction, caudal block, after incision and every 10 minutes during the surgery. After the completion of surgery, patient were shifted to PACU. In the postoperative period pain assessment was done by using the Faces Legs Activity Cry Consolability tool (FLACC, 0-10)[6] at an interval 30 min after operation. Patient with FLACC >4 given iv injection diclofenac 2mg/kg as rescue analgesic, that time was recorded as duration of analgesia. Postoperatively total number of rescue analgesic in 24 hrs were recorded and other side effects like postoperative vomiting, fever, wound dehiscence, wound infection were observed.

Statistics

Sample size was calculated on the basis of previous studies[7,8]. All the quantitative data were calculated using student's t test and for categorical data chi-square test was applied. P < .05 was considered significant.

Result

Demographic variables were comparable in both the groups. Duration of surgery and hemodynamic variable were also comparable in both the groups. Mean duration of analgesia in Group BS versus group BD were [215.50±35.94]min and

[731.25±67.41]min respectively their P value < 0.05 .No significant side effects were observed in the two groups.

Table1 Demographic Data

Parameters	Group BS	Group BD
Age (years)	3.77 ± 1.19	3.79 ± 1.21*
Weight(kg)	13.33 ± 1.58	13.22 ± 1.59*
ASA I:II	36:4	35:5

p>0.05*

Table 2.Surgical parameters

Parameters	Group BS	Group BD
Duration of surgery(min)	37.25± 7.33	37.87± 7.99*
Duration of analgesia(min)	215.50±35.94	731.25±67.41**
Mean no.of rescue analgesic reqd	2.2 ± 0.40	1.05± 0.316**

p>0.05*,p<0.05**

Table 3 Complications

Complications	Group BS	Group BD
vomiting	2	0
Fever	3	2
Wound infection	0	0
Wound dehiscence	0	0

Discussion :

Caudal block is worldwide used regional anaesthesia in paediatric patients for lower abdominal surgeries.[1] It is technically easy and has high success rate. Usually it is performed after giving sedation to the patient and short duration surgeries can be performed solely under caudal block.The limitation of single injection bolus caudal block is its short duration of action[2].Continuous caudal catheter has been used for prolongation of analgesia but its cost and chances of contamination and accidental removal are the major limiting factors. For prolongation of neuraxial block different adjuvants added to local anaesthetics .Different adjuvant like adrenaline,opioids,NSAID,alpha adrenergic agonists clonidine, dexmedetomidine ,Mgso, and dexamethasone have been studied and proven to be very effective in prolongation the duration of peripheral blocks [3-5]. J Y Hong et al studied intravenous dexamethasone 0.5 mg kg⁻¹ in combination with a caudal block in children undergoing day-case paediatric orchiopexy and concluded that it augmented the intensity and duration of postoperative analgesia without adverse effects [7].

We evaluated the effect of dexmethasone in caudal block for hernia repair surgeries in paediatric patients in terms of prolongation of duration of analgesia,requirement of rescue analgesia and any side effects.We selected only hernia repair surgeries for study so that the extent of surgery related pain remains same, to nullify the confounding factor .We took 0.1mg/kg dexamethasone dose for caudal block which was based on the previous studies.[8,9,10,11] We found that dexamethasone prolonged the duration of analgesia , reduces the requirement of rescue analgesic and associated with no side effect,which is similar to the findings of other studies.[8,9,10,11] S.Choudhary et al in there study found that dexamethasone with ropivacaine for caudal block prolonged the effect of analgesic and decreased the requirement of postoperative analgesia. KimEM et al also found the same effect in children undergoing orchiopexy. Yousef GT et al compared the effect of dexamathasone in children undergoing inguinal hernia surgeries and concluded that it enhances the duration of analgesia and subsequently decreases requirement of postoperative analgesia.

Dexamethasone is a highly selective, long acting ,very potent corticosteroid.it is around 40 times more potent than hydrocortisone.Though the exact mechanism of dexamethasone for prolonging the duration of neuraxial blocks is not completely understood .There are two possible mechanism of dexamethasone analgesic effect one it reduces tissue level of bradykinin and

neuropeptides release from nerve ending thus decreases nociception in inflamed tissue. Dexamethasone reduces prostaglandin production in peripheral tissue and in the central nervous system. Secondly it abolishes the inflammatory cytokine release and related nociceptive effect.[11,12,13]

Conclusion :

Dexmethasone when added to bupivacaine in caudal block prolongs the duration of analgesia significantly ,it decreases analgesic requirement postoperatively and not associated with any side effects.It is easy available and cost effective for prolongation of analgesia.

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