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RESEARCH ARTICLE
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PERIOPERATIVE EFFECT OF CAUDAL BLOCK ON PAEDIATRIC PATIENTS UNDERGOING UROGENITAL SURGERIES

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ABSTRACT

Background Caudal block an important regional anesthesia technique, can produce good analgesic effects and maintain stable hemodynamic. But few studies have shown the effect of caudal block in urogenital surgeries in pediatric population and evaluated its impact on the overall patient outcome. **Aim** To understand the effect of caudal block on the hemodynamic, perioperative opioid requirement and post operative analgesia in the pediatric patients. **Methods** Eighty pediatric patients, aged 6 months to 5 years, ASA grade I-II, scheduled to undergo urogenital surgery, were given caudal block with 1.2 ml/kg 0.2% Ropivacaine after induction of general anesthesia . The primary outcome variable was preoperative fentanyl use. The secondary outcome variables were pain score, hemodynamic fluctuation, the number of patients needing rescue fentanyl and side effects. **Results** Caudal block with 1.2 ml/kg of 0.2% ropivacaine significantly decreased perioperative fentanyl usage. Moreover, patients displayed stable hemodynamics, lower pain score in the PACU and 8 h after operation, less demand for rescue fentanyl, shorter time of PACU stay. **Conclusion**Caudal block with 1.2 ml/kg of 0.2% ropivacaine helps maintain stable hemodynamic, reduced perioperative opioids use during urogenital surgery on paediatric patients and produced good postoperative analgesia

KEY WORDS: Caudal block, Paediatric patient, Urogenital surgery, Ropivacaine

ABBREVIATIONS

ASA: American Society of Anesthesiologists, FLACC: Face Legs Activity Cry Consolability, NIBP: Non Invasive Blood Pressure, HR: Heart Rate, PACU: Post Anesthesia Care Unit, NSAIDS: Non Steroidal Anti Inflammatory Drugs, TAP: Transverse Abdominalis Plane, GA: General Anesthesia.

MAIN TEXT

Introduction

Regional anaesthesia in children has become increasingly popular over the past few years. A variety of peripheral and central nerve blocks have been developed to ensure that perioperative pain can be effectively controlled. The same developments have made it possible to reduce the dose concentrations of systemic drugs. Caudal block, a well-established technique in pediatric surgeries such as lower limb surgery and lower abdominal surgery, can produce good analgesic effects and maintain stable hemodynamic**[1-3].** Several studies show that caudal block also produces good postoperative analgesic effects after pediatric surgery **[4, 5].** But few studies have shown the effect of caudal block in urogenital surgeries in pediatric population and evaluated its impact on the overall patient outcome.

Methods

An observational study was undertaken in Government Medical College Srinagar's 500 Bedded Pediatric Hospital from July 2024 to March 2025 on eighty pediatric patients, aged 6 months to 5 years, ASA grade I-II, scheduled to undergo urogenital surgery.The parents of the children were advised to follow pre operative instructions as explained to them by the hospital staff. In the operating room the children were given general anaesthesia before caudal block. The patients were kept in a lateral position and the caudal area was identified and cleaned using chlorohexidine solution. Caudal block was performed with 0.2% Ropivacaine in a dose of 1.2 ml/kg using a 22 G needle. After the procedure of caudal block, the anesthesiologist who performed caudal block left the operating room, another anesthesiologist, who was blind to the grouping information, entered the operating room and managed the patients intraoperatively. Also he began to record the frequency of hemodynamic fluctuation. Hemodynamic fluctuation was defined as NIBP and (or) HR increasing or decreasing by more than 30% of the baseline and lasting for more than 2 min. If HR decreased by more than 30% of the baseline, atropine 0.01 mg/kg was given intravenously. If NIBP or HR increased by more than 30% of the baseline, an extra of 0.5 μg/kg fentanyl was given intravenously according to the anesthesiologist's experience in hemodynamics fluctuation. The total amount of fentanyl used during surgery and the times of hemodynamic fluctuation were also recorded.

Patients were extubated on completion of the procedure and were transferred to the Post Anesthesia Care Unit (PACU).In PACU, pain evaluation was performed by using the FLACC (Face Legs Activity Cry Consolability) score described by previous studies **[5, 6 and 7]**. The same observer, who was blind to the allocating information, investigated the FLACC score. When the FLACC score was higher than 4, a rescue dosage of 0.5 μg/kg fentanylwas given to the patient intravenously. The FLACC score was re-investigated after 15 min of rescue fentanyl injection. If it was still higher than 4, another dosage of 0.5 μg/kg fentanyl was given. The FLACC score, the number of patients needing rescue fentanyl, the total amount of rescue fentanyl, side effects such as nausea and vomiting, and the time of PACU stay were also investigated. After the PACU stay, patients were transferred to the ward, and the FLACC score of every 8 hours in ward was also investigated. If the patients suffered from acute pain, oral paracetamol 15 mg/kg was prescribed. The number of patients needing NSAIDs, time to the first NSAIDs use in ward and side effects were also evaluated.

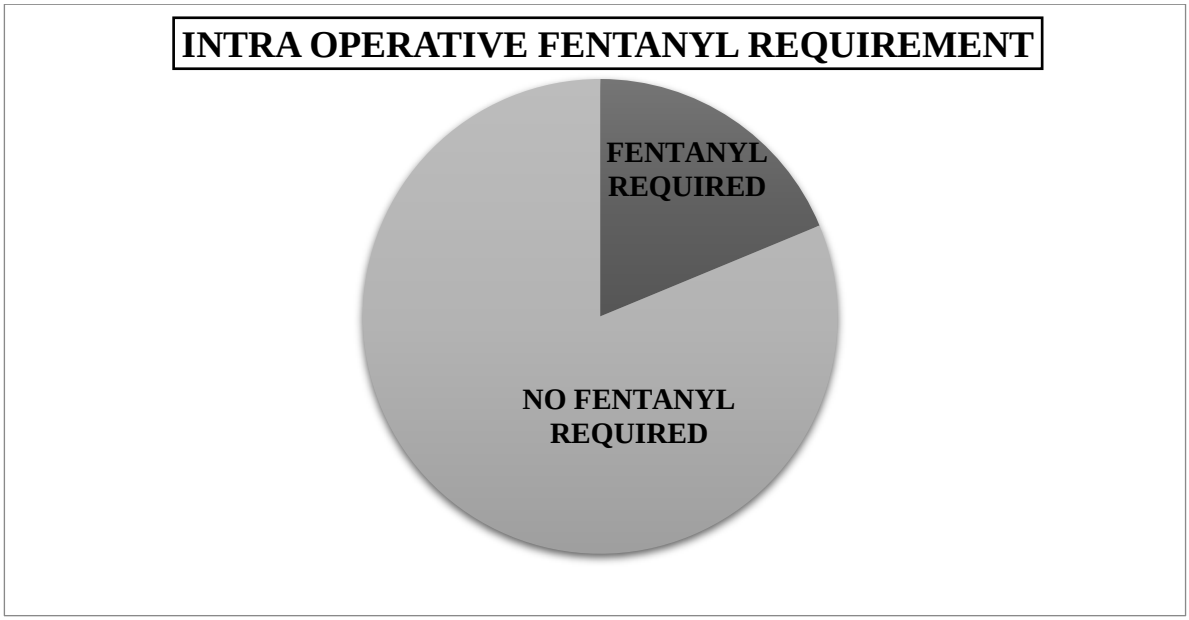
Results

A total of eighty patients were the part of the study that underwent urogenital surgeries after receiving caudal block with 0.2% Ropivacaine (1.2 ml/kg) out of which 25 (31%) patients underwent herniotomy and 22 (28%) patients had PUV fulguration with cystoscopy.

TABLE 1

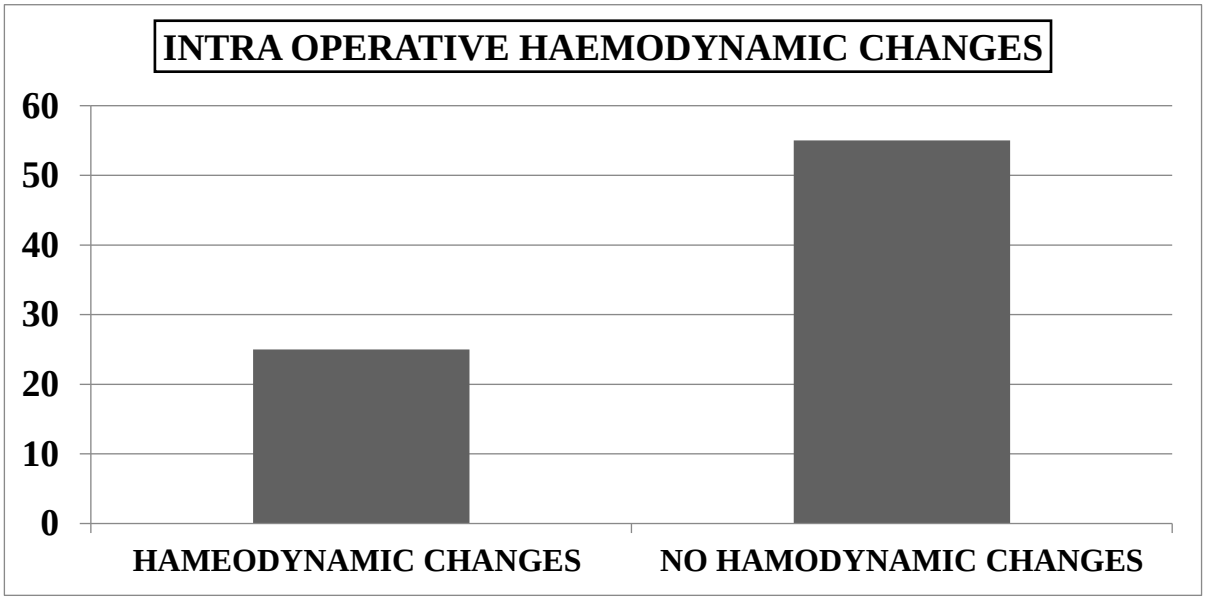
PROCEDURE	NUMBER	PERCENTAGE (%)
HERNIOTOMY	25	31
CIRCUMCISION	15	18
PUV FULGURATION AND CYSTOCOPY	22	28
ORCHIDOPEXY	10	12
OTHERS	8	10

FIGURE 1



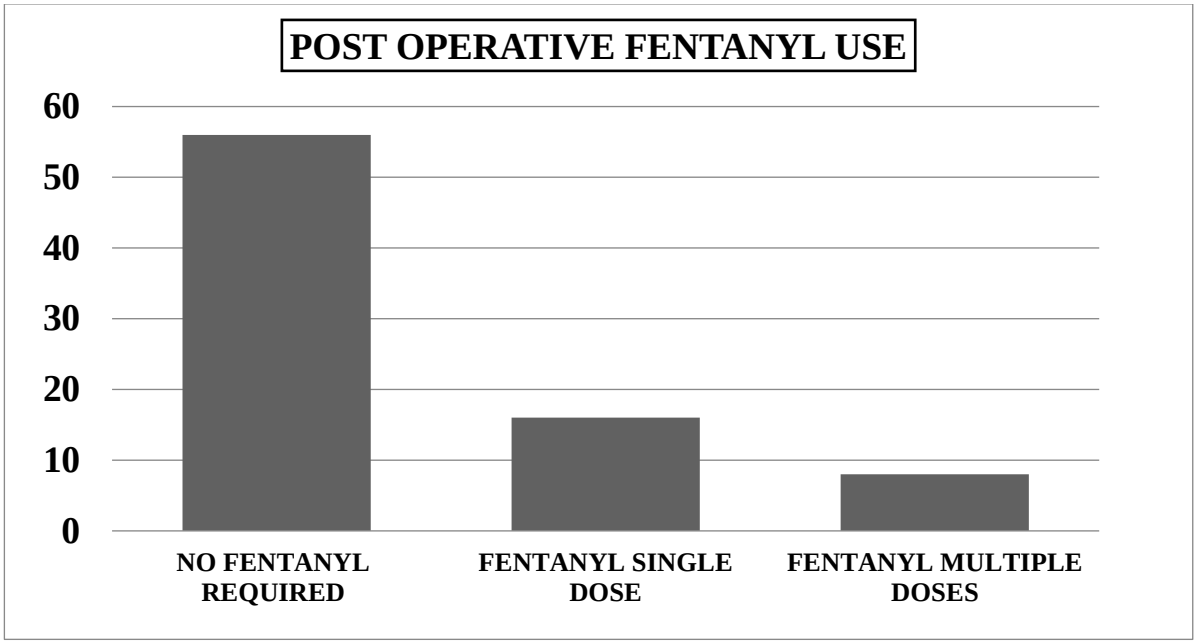
The intra operative fentanyl requirement was reduced after the caudal block with only 20 patients (25%) out of 80 requiring any addition use of fentanyl intraoperatively as per the criteria set earlier.

FIGURE 2



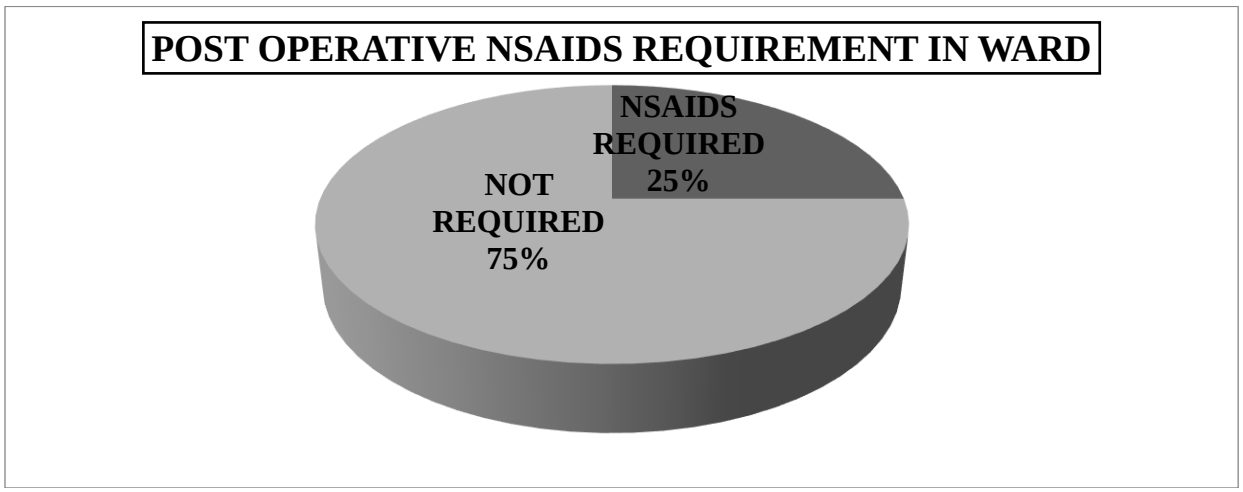
Intra operative hemodynamic remained stable in majority of patients given caudal block prior to procedure with only 25 patients (31%) requiring any intervention as compared to 55 patients (69%) remaining completely stable.

FIGURE 3



Use of opioids was noted to be reduced in patients who were given caudal block with 0.2% Ropivacaine with only 24 patients (30%) feeling the need for it in PACU to control pain.

FIGURE 4



The analgesic requirement in the ward during post operative period was also shown to be reduced in patients of caudal block with only 25% patients requiring NSAIDS in wards upto 12 hrs post procedure.

TABLE 2

POST OPERATIVE COMPLICATIONS	NUMBER	PERCENTAGE (%)
NAUSEA	9	11
VOMITING	4	5
DROWSINESS	2	2.5
HEADCAHE	3	4
OTHERS	2	2.5

Only twenty patients (25%) of patients who had a caudal block reported complications in the period following surgery with most patients among them complaining of nausea as the main symptom.

Discussion

This study was done to understand the effect of caudal block on pediatric patients undergoing urogenital surgeries. We found that caudal block with 1.2 mL/kg of 0.2% ropivacaine reduced perioperative fentanyl use and maintained stable hemodynamics during surgery. It also helped reduced the post operative requirement of opioids and NSAIDS in children. Use of opioids not only increases stay in PACU but also leads to numerous complications like nausea, vomiting, drowsiness etc in the post operative periods thus leading to increased hospital expenditure**[8, 9, 10].**A vast variety of techniques like TAP block, local anaesthesia infiltration use at surgical site etc are being used to decrease the dependency on opioid use and the side effects that are associated with their use. **[11-13].**

In this study, we found that caudal block with 1.2 mL/kg of 0.2% ropivacainesignificantly reduced the use of fentanyl and the occurrenceof vomiting. It also shortened the time of PACU stay. Faasse et al. **[4]** investigated the effects of TAP and caudal block on children in urologic robot-assisted laparoscopic surgery and found that patients with caudal block needed less opioids during surgery and less postoperative antiemetic. In our study, caudal block with 1.2 mL/kg of 0.2% ropivacaine decreased perioperative fentanyl use and the occurrence of postoperative vomiting, a fact that was consistent with the previous study.

Ben-David et al. explained the role of caudal epidural block in lowering the analgesic requirements intraoperatively and resultant pain relief in the post operative period **[14].** Caudal block results in reduced requirements for the sedative-hypnotic in GA **[15].** Cesim et al.'s study also shed light on the vitality of role of the caudal block in achieving better postoperative pain control **[16]**

Conclusion

Caudal block using 0.2% Ropivacaine in a dose of 1.2 ml/kg is an effective method of controlling pain in children undergoing urogenital surgeries, and, also helps in reducing analgesic use in perioperative period

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