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Research Article

THE SAFETY OF EPIDURAL ANESTHESIA FOR LOWER ABDOMINL AND LOWER LIMB SURGERY IN PEDIATRIC AGE GROUP

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ABSTRACT

BACKGROUND: Early ambulation and discharge as well as a reduction in the requirement for both narcotic and non-narcotic analgesics have been linked to regional analgesia. It produces profound analgesia with little change in physiology. The psychological conditions during this pain-free phase are excellent for the healing child and family. Additionally, since most blocks have a fairly predictable duration of action, it is possible to carefully time the administration of a second analgesic medication to take effect when the block wears off. When general anesthesia is technically challenging or linked to a higher risk of morbidity and death, regional anesthesia can be helpful.

MATERIAL AND METHOD: The present study was carried out in the department of Anaesthesialogy & Critical Care on thirty paediatric patients admitted in surgical and orthopaedic units of this hospital, after getting the permission from the Institutional Ethics Committee.

RESULTS: Mean Weight in group A was 8.75 Kg with range of approximately 6 to 11 Kg and in group B the mean weight was 23.01 Kg with the range of approximately 16 to 30 Kg. The mean dose of injection lidocaine with adrenaline on the basis of weight, was 7.8±0.72mg/Kg in group A and 9.0 ± 0.73 mg/kg in group B. The mean volume of local anaesthetic solution came out to be 7.15±1.98 ml for group A and for group B it was 13.99±4.87 ml.

CONCLUSION: Following the procedure, the patient wakes up pain-free, the child is much easier to handle, and the attendants' worry decreases significantly as the patient lies comfortably following the procedure. Using an epidural block can help prevent many of the negative consequences of general anaesthesia when it is the only anesthetic approach employed.

KEYWORDS: Analgesic, Paediatric, Post-operative and Epidural Analgesia

INTRODUCTION:

The main objective of most regional blocks in pediatric patients is to provide intra operative and postoperative analgesia. It is likely that a child who wakes up after a regional block would never suffer the same amount of agony that a child who wakes up in pain will. A child who wakes up without pain is considerably easier to manage than one who wakes up with pain.1

Early ambulation and discharge as well as a reduction in the requirement for both narcotic and non-narcotic analgesics have been linked to regional analgesia. It produces profound analgesia with little change in physiology. The psychological conditions during this pain-free phase are excellent for the healing child and family. Additionally, since most blocks have a fairly predictable duration of action, it is possible to carefully time the administration of a second analgesic medication to take effect when the block wears off.When general anesthesia is

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technically challenging or linked to a higher risk of morbidity and death, regional anesthesia can also be helpful. In children with a history of malignant hyperthermia, neuromuscular, metabolic, cardiac, or chronic lung disease, or in emergency scenarios where patients are at danger of aspirating stomach contents into their lungs, regional anesthesia may be a better option than general anesthesia. In trauma patients where the neurological evaluation is still incomplete and the vital signs are erratic, regional anesthesia offers analgesia without interfering with neurologic monitoring (especially when there is a concomitant head injury).2

The goals of elective surgery are not the same as those of an emergency. Among the several anesthetic methods accessible is regional anesthesia. It results in a speedy anesthetic recovery while continuing to have a strong analgesic effect for up to 24 hours following surgery.3

The present study has been undertaken to know the efficacy safety, advantages & disadvantages of the technique of epidural anaesthesia in paediatric age group.

MATERIAL AND METHODS

The present study was carried out in the department of Anaesthesiology & Critical Care of this hospital. The study was on thirty paediatric patients admitted in surgical and orthopaedic units of the hospital after getting the permission from the Institutional Ethics Committee.

SUBJECT OF STUDY: -

The aim of the study was to see the efficacy, safety, advantages, disadvantages and cardiorespiratory stability under epidural anaesthesia in children undergoing various lower abdominal and lower limb surgical interventions.

SELECTION OF PATIENTS

Inclusion criteria

The patients of either sex selected for study were those kept for operation by the department of surgery and orthopaedics as a routine or emergency case. The patients selected were of ASA Grade I and Grade Il, between the age group of I to 12 years, undergoing lower abdominal, perineal or lower limb surgery.

Exclusion criteria

Patients with respiratory disorder
Patients with cardiovascular disorder
Patients with neurological disorder
Patients with disease of spine
patients with skin lesion at the site of lumbar puncture.
Patients with any bleeding disorder.

All the patients were categorized in two groups

GROUP A- Comprised of children aged 1 to 5 years-given epidural anaesthesia With 21 G hypodermic needle

GROUP B- Comprised of children aged 6-12 years-given epidural an- aesthesia with 21 G spinal needle.

METHOD:-

Each patient was examined thoroughly physically and medical history taken before premedication & induction of anaesthesia. Pulse rate, blood pressure respiratory rate, SpO2 and routine laboratory tests checked and recorded in the file record.

Technique

The child was placed in lateral position with knee &hip flexed after giving injection Midaz 0.25mg to 0.5mg and injection Ketamine 0.25mg/Kg B.W. Now the back of the child was prepared for epidural injection, using savlon, betadine and sprit. Taking all aseptic precautions, the intervertebral space was identified - the vertebrae corresponding with the highest point of iliac crest being L_4, or the space corresponding with highest point of iliac crest being L_{4-5}. Now after identification of L_{4-5} or L_{3-4} intervertebral space, the 21 G spinal or hypodermic needle, depending upon the age of the patient, was inserted in the desired intervertebral space and advanced. Just when the tip of the needle pierced the

subcutaneous tissue the advancement was stopped and a frictionless & leakage free glass syringe filled with 3-5 ml of air was attached to the needle. The needle was advanced into the epidural space by maintaining a gentle pressure with the thumb, to detect the loss of resistance. As the tip of the needle entered the epidural space piercing ligamentum flavum, there was a sudden loss of resistance and the piston moved freely forwards in the syringe.4

Local anaesthetic solution - 2% lignocaine hydrochloride with adrenaline in the dose of 7-10 mg/kg diluted to 1.5% was injected in the identified epidural space after negative aspiration test for cerebrospinal fluid orblood. Now the patient was immediately made supine and the surgery was allowed to proceed after the establishment of block.

RESULTS:

The present work "To see the efficacy, safety and cardiorespiratory stability under epidural anaesthesia in children undergoing various lower abdominal & lower limb surgical interventions" has been made on a series of 30 cases admitted in Medical College Hospital. The following observations have been made.

Table 1: Age, Sex Incidence

Age in year	No. of Male	No. of Female	Total Number	% of Males	% Of Females
1-5	7	02	9	77.77	22.23
6-12	16	05	21	76.19	23.81

The maximum number of cases studied, were in the age group of 6-12 years with the male female ratio of 3.3:1 Males predominated, being about 77%. There was significant difference in number of cases in both groups ($p<0.05$)

Table 2: Mean Weight of patients and mean dose requirement of Lignocaine hydrochloride with adrenaline on the basis of Weight in both groups:

Group	Mean Weight (Kg)±SD	Mean dose (Mg/Kg) ±SD (of 2% sol.)	Mean dose (Mg/Kg) ±SD (of 1.5% sol.)
A	8.75±2.63	7.8±0.72	7.15±1.98
B	23.01±7.08	9.0±0.73	13.99±4.87

Mean Weight in group A was 8.75 Kg with range of approximately 6 to 11 Kg and in group B the mean weight was 23.01 Kg with the range of approximately 16 to 30 Kg. The mean dose on the basis of weight, was 7.8±0.72mg/Kg in group A and 9.0 ± 0.73 mg/kg in group B. The mean volume of local anaesthetic solution came out to be 7.15±1.98 ml for group A and for group B it was 13.99±4.87ml.

DISCUSSION

Although regional anesthesia was not commonly used for pediatric patients, interest in this procedure is currently expanding. Procedures on the lower limbs and abdomen can be performed under epidural anesthesia. The benefits of regional anesthesia include superior post-operative analgesia and a decreased need for further anesthetics.5

It wasn't until the mid-1970s that general anesthesia was once more recognized as having drawbacks that required consideration when used alone. Reaffirmed openly once more, the many benefits of regional anesthesia started off timidly before taking off almost explosively. The availability of less traumatic devices and toxic local anaesthetics, along with significant scientific

advancements in anatomy, physiology, and pharmacology as they relate to the use of local anesthetics for children in particular, all contributed to the subsequent redevelopment and acceptance of regional anesthesia.6

Spinal anesthesia significantly decreased morbidity and death during a period when chloroform was the preferred agent for pediatric anesthesia. Notable benefits included restricting anesthesia to the area that needed to be operated on, relaxing muscles, and avoiding an overly distended stomach. However, the most noteworthy benefit was the near complete lack of vomiting during the recovery phase, which coincided with a swift return to regular feeding. The extended duration of post-operative analgesia and the corresponding decrease in opioid use also impressed Gray.7,8

Growing criticism around the use of procedures like spinal anesthesia in children coincided with the introduction of neuromuscular blocking drugs and halothane to pediatric anesthesia practices. A few writers went on to praise the method. Some argued that "spinal anesthesia in children has been and still is frowned upon by the majority of anaesthetists and surgeons," while others said that "spinal anesthesia is an excellent method for children."9

CONCLUSION:

following surgery, the patient wakes up pain-free, the child is much easier to handle, and the attendants' worry decreases significantly as the patient lies comfortably following the procedure. Using an epidural block can help prevent many of the negative consequences of general anesthesia when it is the only anesthetic approach employed. Since the majority of patients in this age bracket are uncooperative, there are very few side effects or difficulties from the treatment itself. Light general anesthesia might be used in addition before the procedure.

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