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Nalbuphine as an adjuvant to levobupivacaine induced caudal analgesia in children.

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Abstract

This study was to assess the postoperative analgesic requirements and the analgesic effects of caudal Nalbuphine as an adjunct to levobupivacaine in comparison to caudal levobupivacaine. These patients have a shorter hospital stay, and side effects may not be noticed at home. Caudal block has the importance in decreasing consumption of systemic analgesics.A single-shot caudal injection of levobupivacaine as sole local anesthetic provides effective postoperative analgesia without need for systemic analgesics.The duration of block can be extended by adjuvant drugs, which are given together with a local anesthetic agent; thereby more efficient postoperative analgesia can be obtained. For this purpose, many drugs are being used today as adjuvants e.g. morphine, fentanyl, clonidine, ketamine.

Keywords:

EDTA-CEB- CHEOPS-VAS- Levobupivacaine

List of Abbreviations

CA:	**Caudal anesthesia**
CEB:	**Caudal Epidural Block**
CSF:	**Cerebrospinal Fluid**
PDPH:	**Post Dural Puncture Headache**
LA:	**Local Anesthetics**
AAG:	**Alpha- 1-acid glycoprotein**
EDTA:	**Ethylenediamine tetraacetic acid**
MEGX:	**Monoethylglycinexyl idide.**
Cmax:	**Peak plasma concentration.**
PaO2:	**Arterial oxygen tension.**
PABA:	**Para-Amino Benzoic Acid**
CNS:	**Central Nervous System**
TRI:	**Transient Radicular Irritation**
ETT:	**Endotracheal tube**
HR:	**Heart rate**
MAP:	**Mean arterial pressure**
AIIMS:	**All India Institute of Medical Sciences**
MAC:	**Minimum Alveolar concentration**
PCEA:	**Patient Controlled Epidural Analgesia**
VAS:	**Visual Analogue Scale**
CHEOPS:	**Children Hospital of Eastern Ontario behavioral scale**

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Section one: Introduction

INTRODUCTION

Caudal anesthesia for pediatric surgery was first reported in 1933.[1] Since then studies have described the indications for pediatric caudal block, the level of analgesia, recommended doses and pharmacokinetics of local anesthetics used in caudal anesthesia and the general or specific advantages and disadvantages of the technique .[2-5]

Caudal anesthesia (CA) is epidural anesthesia of the caudaequina roots in the sacral canal, accessed through the sacral hiatus. CA is a common pediatric regional technique that is quick to learn and easy to perform, with high success and low complication rates. CA provides high quality intraoperative and early postoperative analgesia for sub-umbilical surgery.

In children, CA is most effectively used as adjunct to general anesthesia and has an opioid-sparing effect, permitting faster and smoother emergence from anesthesia. [6]

A single shot caudal anesthetic provides relatively brief analgesia, on the order of 4 to 8 hours depending on the agent used, and is appropriate for inpatient and outpatient management strategies.

A successful caudal anesthetic blockade affords the anesthesiologist the opportunity to reduce intraoperative use of volatile anesthetic agent and to use a narcotic-sparing approach that

ultimately may benefit the patient while providing a better postoperative course with less nausea and vomiting. [7]

Prolongation of anesthesia can be achieved by adding various adjuvants, such as opioids and non-opioids like clonidine, ketamine, midazolam and neostigmine, with varying degrees of success. [8-12]

Nalbuphine also was added in epidural analgesia and provide an increase in the efficacy and the duration of postoperative analgesia.[13]

AIM OF THE WORK

To compare the effects of plain levobupivacaine 0.25%and levobupivacaine 0.25% plus nalbuphine 0.1 mg/kg single-shot caudal epidural for postoperative pain relief in children undergoing surgeries of lower half of the body.

Section two:
Review of literature

CAUDAL CANAL BLOCK

Caudal Epidural Block :

Caudal anesthesia has been used for many years and is the easiest and safest approach to the epidural space. When correctly performed there is little danger of either the spinal cord or dura being damaged.

Caudal or sacral epidural block is gaining wider publicity because of proven efficacy in pediatric patient pain management, acute & chronic pain management, spinal endoscopy & epidural adhesiolysis. Though caudal technique was reported earlier than lumbar technique, the first technique lost much of its clinical utility. This was because of inconsistent results secondary to inadequate understanding of anatomy.[14]

Applied Anatomy :

The caudal (sacral) canal extends from the upper border of sacral bone (in relation to lumbar epidural space) to the sacral hiatus. Whole of this canal is enclosed in sacral bone.

Sacrum :

The five sacral vertebrae unite to form sacrum. The sacrum articulates with fifth lumbar vertebra superiorly, coccyx inferiorly & iliac bones laterally. The anterior surface of sacrum has four paired openings for the exit of anterior rami of sacral nerves *(figure 1).*

The posterior surface is convex & rough in nature because of fusion of vertebral elements. Median sacral crest runs over the posterior surface (thick crest represents the fused portions of sacral spinous process). The posterior surface has four pairs of foramina for escape of posterior rami of sacral nerves. The laminae of fifth sacral vertebra (sometimes fourth also) fails to fuse; the resultant gap is called the sacral hiatus. On either side of sacral hiatus are the remnants of the inferior articular processes of the fifth sacral vertebra which are called the sacral cornua. The sacral hiatus is covered by sacrococcygeal membrane which is an extension of the ligamentumflavum and is pierced by coccygeal & fifth sacral nerves. Medial to sacral foramina intermediate sacral crest can be appreciated. They are formed by fusion of transverse process of sacral vertebrae. These crests end at sacral cornua, which are also nothing but remnants of articular process of fifth sacral vertebra. [14]

The sacrum of children is also more narrow and flat compared to the adult population. [6]