Clonidine bupivacaine combination versus neostigmine bupivacaine combination versus bupivacaine for caudal anaesthesia in paediatric patients

Thesis
Submitted for partial fulfillment of the M.D. degree
in
Anaesthesia

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Acknowledgement

Thanks ***Allah*** who allowed and helped me to complete this work.

I would like to express my great appreciation and thanks to ***Prof. Dr. Farouk Ahmed Sadek*** for his helpful supervision throughout this work. It is great honor for me to work under his guidance.

Many special thanks and my great respect for ***Prof. Dr. Laila Aly Elkafrawy*** for her continuous encouragement and support throughout this work.

It gives me a great pleasure and honor to be guided and advised by ***Assist. prof. Dr. Hesham Mohammed Elazzazi*** who supported me. Many thanks for his great effort throughout this work.

Haytham Ibrahim.

List of contents

Title ……. Page

List of tables

List of figures

List of figures

No. ***Title*** ***Page***

INTRODUCTION

Introduction:

Caudal epidural analgesia is one of the most popular and commonly performed regional blocks in paediatric anaesthesia. It is a reliable and safe technique that can be used with general anaesthesia for intra and post operative analgesia in patients undergoing abdominal, pelvic and lower limb surgeries. Furthermore, it is easy to be performed in young children. **(Dalens and Hasnaoui, ١٩٨٩)**

The main disadvantage of caudal anaesthesia is the short duration of action after a single injection of a local anaesthetic. Even long acting local anesthetics such as bupivacaine provide only ٤-٨hr of analgesia. Prolongation of caudal analgesia using a single shot technique has also been achieved by addition of various adjuvants. **(Lioyd Thomas , ١٩٩٠)**

Bupivacaine has been in clinical use for more than ٣٠ years and is available commercially as a racemic mixture containing equal proportions of the S (-) and R (+) isomers. It is widely used for caudal epidural analgesia in children because of its long duration of action and beneficial ratio of

sensory to motor block. (**Gunter et al ,١٩٩١)**

Clonidine, an alpha-٢ adrenergic agonist, produces analgesia without significant respiratory depression after systemic, epidural or intrathecal administration (**Filos et al, ٢٠٠٢**). Its analgesic effect results from direct stimulation of pre and post synaptic alpha-٢ adrenoceptors in the dorsal horn grey matter of the spinal cord, thereby, inhibiting the release of nociceptive neurotransmitters.

Neostigmine is a known cholinesterase inhibitor agent. Its neuraxial administration inhibits the breakdown of the endogenous spinal acetylcholine, which has shown to produce analgesia. The analgesic effect is thought to be mediated via spinal muscarinic (M١) receptors (**Yaksh and Collins, ١٩٨٩**)

#Aim of the work:

The aim of the present study is to compare the intraoperative and postoperative pain-relieving quality of a bupivacaine ٠.٢٥% with clonidine ٢ug/kg (١ ml/kg) mixture to that of bupivacaine ٠.٢٥% with neostigmine ٤ug/kg mixture and that of plain bupivacaine ٠.٢٥% for caudal administration in children.

Patients and methods:

Inclusion criteria;

After departmental approval and informed parental consent, ٦٠ paediatric patients of both sexes, **ASA** physical status I or II, age ranging between ٦-١٢ years, undergoing any lower abdominal or pelvic surgery will be enrolled in this study in AIN SHAMS UNIVERSITY hospitals

**Exclusion criteria;*

Any contraindication to caudal anaesthesia, including:

-Children with coagulopathy, neuromuscular or spinal disease.

- Children with back problems and local skin infection of the caudal area.
- Children with mental retardation or delayed development.
- Known or approved allergy of the trial drugs.
- Any cause of increased intra cranial tension (for the possibility of total spinal anaesthesia)

Technique of caudal block:

Before induction of general anaesthesia, an intravenous cannula is placed. Lactated

Ringer solution is used to correct fluid deficit and for maintenance. The airway is maintained with an endotracheal tube.

The study solutions are administered while the child is lying in the lateral position after induction of general anaesthesia. A caudal injection of the different mixtures using a short B-bevel ٢٢- gauge needle. To detect and avoid any intravenous or subarachnoid injection, repeated aspiration and injection of the local anaesthetic in increments should be done while watching the vital signs and the electrocardiographic monitor.

Skin incision begins at ٢٠ minutes after caudal block. After skin incision, the child is observed for signs of gross purposeful muscular movement and hemodynamic stability.

Intraoperative monitoring: #

- Electrocardiogram.
- Non invasive blood pressure and peripheral oxygen saturation.

Patients will be divided into ٣ groups according to the type of local anaesthetic injected;

١- ٢٠ *patients will receive plain bupivacaine ٠.٢٥% (١ml/kg).*
٢- ٢٠ *patients will receive bupivacaine ٠.٢٥% with clonidine ٢ug/kg (١ml/kg)*
٣- ٢٠ *patients will receive bupivacaine ٠.٢٥% with neostigmine ٤ug/kg (١ml/kg)*

<u>All patients will be assessed and monitored for:</u>

١- Haemodynamic stability as regards non invasive mean arterial pressure and heart rate to be recorded before and after caudal injection, then every ٥ minutes as anaesthesia is initiated and every ٣٠ minutes postoperatively.

٢- Analgesic quality using the modified objective pain scale (OPS) score. (**Wilson and Dolye, ١٩٩٦)**

٣- The duration of pain relief (defined as the time from caudal injection until the first dose of postoperative analgesia).

٤- Motor power postoperatively.

٥- Residual postoperative sedation using sedation score by Skeie of Ulleval Hospital University of Oslo, Norway. (**Skeie , ١٩٨٨)**

٦-Time to first micturition.

 # Results: Will be analyzed statistically.
 # Discussion.
 # Conclusion.
 # Summary.
 # References.
 # Arabic summary.

Aim of the work

The aim of this study is to evaluate the intra operative and post operative pain relieving quality of plain caudal bupivacaine ٠.٢٥% (١ ml/kg) compared to a mixture of bupivacaine ٠.٢٥% (١ ml/kg) with clonidine ٢ *u*g/kg and to another mixture of bupivacaine ٠.٢٥% (١ ml/kg) with neostigmine ٤ *u*g/kg following caudal administration in children.

Caudal anaesthesia

Caudal anaesthesia is still the single most important paediatric regional anaesthetic technique despite the increasing popularity of peripheral nerve blocks. Caudal anaesthesia can be used for all types of surgery below the umbilicus; it is simple, safe and effective. **(Jhr and Berger, ٢٠٠٤)**

Indications:

Caudal anaesthesia is most commonly used as adjunct to general anaesthesia in order to provide postoperative pain relief in selected cases; it is used as a sole anaesthetic technique in small babies. The practice is to use awake caudals exclusively for peripheral surgery and to administer a general anaesthetic combined with a caudal block for inguinal hernia repair**. (Jhr and Berger, ٢٠٠٤)**
But some colleagues successfully use awake caudals for this indication as well. **(Gerber and Weiss, ٢٠٠٣).**

Technical aspects: