شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

HANAA ALY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

Nalbuphin as an Adjuvant to Levobupivacaine in Caudal Analgesia in Children

Thesis

Submitted for Partial Fulfillment of Master Degree in Anesthesiology

By

Mohamed Mahmoud Soliman

MB.,B.CH

Under supervision of

Prof. Mostafa Kamel Reiad

Professor of Anesthesiology

Faculty of Medicine - Ain Shams University

Assist. Prof. Dr. Sanaa Mohamed Elfawal

Assistant Professor of Anesthesiology

Faculty of Medicine - Ain Shams University

Dr. Rehab Abdel Fattah Abdel Razik

Lecturer of Anesthesiology

Faculty of Medicine - Ain Shams University

Faculty of Medicine

Ain Shams University

2021

سورة البقرة الآية: ٣٢

Acknowledgment

First and foremost, I feel always indebted to **ALLAH,** *the Most Kind and Most Merciful.*

I'd like to express my respectful thanks and profound gratitude to **Prof. Mostafa Kamel Reiad,** *Professor of Anesthesiology, Faculty of Medicine - Ain Shams University for his keen guidance, kind supervision, valuable advice and continuous encouragement, which made possible the completion of this work.*

I am also delighted to express my deepest gratitude and thanks to **Assist. Prof. Dr. Sanaa Mohamed Elfawal,** *Assistant Professor of Anesthesiology, Faculty of Medicine - Ain Shams University, for her kind care, continuous supervision, valuable instructions, constant help and great assistance throughout this work.*

I am deeply thankful to **Dr. Rehab Abdel Fattah Abdel Razik,** *Lecturer of Anesthesiology, Faculty of Medicine - Ain Shams University, for her great help, active participation and guidance.*

Mohamed Soliman

List of Contents

List of Abbreviations

Abb.	Full term
AAG	Alpha-1-acid glycoprotein
ASA	American Society of Anesthesiologists
CBC	Complete blood count
Cl	Clearance
CNS	Central nervous system
CYP	Cytochrome
ECG	Electrocardiography
ETT	Endotracheal tube
HR	Heart rate
INR	International normalized ratio
LAST	Local anethetic systemic toxicity
MAC	Minimum Alveolar Concentration
MAP	Mean arterial pressure
PABA	Para-amino benzoic acid
PCEA	Patient-controlled epidural analgesia
PDPH	Post dural puncture headache
PONV	Postoperative nausea and vomiting
PT	Prothrombin time
PTT	Partial thromboplastin time
SPO2	Oxygen Saturation
TFAR	Time to first analgesic requirement
VAS	Visual analogue scale
VDss	Higher volumes of distribution at steady state

List of Tables

List of Tables Cont...

List of Figures

INTRODUCTION

Various multimodal technniques have been designed for pediatric pain relief. These include both systemic and regional analgesia. The most commonly used regional technique is caudal epidural block ***(Xiang et al., 2013).***

Caudal anethesia (CA) is the single most important pediatric regional anaethetic technique. The technique is relatively easy to learn, has a remarkable safety record and can be used for a large variety of procedures ***(Jöhr and Berger, 2012).***

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 ***(O'Raux et al., 2010).***

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 ***(Mukherji et al., 2011).***

Prolongation of anesthesia can be achieved by adding various adjuvants, such as opioids like fentanyl and non-opioids like, dexmedetomoidine, ketamine, midazolam,

clonoidine with varying degrees of success ***(Sanwatsarkar and kapur et al., 2017).***

Nalbuphine can be added in caudal analgesia and provide an increase in the efficacy and the duration of postoperative analgesia ***(Abdallah et al., 2019).***

AIM OF THE WORK

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

Chapter 1

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 ***(Chen et al., 2004).***

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 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. 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. The sacral hiatus is covered by sacrococcygeal membrane which is an extension of the ligamentumflavum and is pierced