بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

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

MONA MAGHRABY

Comparative study between ultrasound guided pudendal nerve block versus caudal epidural block anesthesia in children undergoing hypospadias Surgery

Thesis

Submitted for Partial Fulfilment of M.D. in Anesthesia, Intensive Care Unit and Pain Management

By

Mohamed Hamed Abd El Aziz

M.B.B.C.

Under supervision of

Prof. Dr. Mohamed Hossam Eldin Hamdy Abd Elwahed Shokier

Professor of Anesthesia, Intensive Care Unit and Pain Management
Faculty of Medicine – Ain Shams University

Prof. Dr. Sherif Gorge Anees Saed

Assistant Professor Anesthesia, Intensive Care Unit and Pain Management
Faculty of Medicine – Ain Shams University

Prof. Dr. Walid Abdalla Ibrahim

Assistant Professor of Anesthesia, Intensive Care Unit and Pain Management
Faculty of Medicine – Ain Shams University

Dr. Amr Ahmed Ali Kassm

Lecturer of Anesthesia, Intensive Care Unit and Pain Management
Faculty of Medicine – Ain Shams University

Faculty of Medicine
Ain Shams University
2021

Acknowledgement

*First of all, all gratitude is due to **Allah** almighty for blessing this work, until it has reached its end, as a part of his generous help, throughout my life.*

*Really I can hardly find the words to express my gratitude to **Prof. Dr. Mohamed Hossam Eldin Hamdy Abd Elwahed Shokier,** Professor of Anesthesia, Intensive Care Unit and Pain Management, Faculty of Medicine – Ain Shams University, for her supervision, continuous help, encouragement throughout this work and tremendous effort she has done in the meticulous revision of the whole work. It is a great honor to work under her guidance and supervision.*

*I would like also to express my sincere appreciation and gratitude to **Prof. Dr. Sherif Gorge Anees Saed,** Assistant Professor Anesthesia, Intensive Care Unit and Pain Management, Faculty of Medicine – Ain Shams University, for his continuous directions and support throughout the whole work.*

*I cannot forget the great help of **Prof. Dr. Walid Abdalla Ibrahim, Dr. Amr Ahmed Ali Kassm** Assistant Professor of Anesthesia, Intensive Care Unit and Pain Management, Faculty of Medicine – Ain Shams University for his invaluable efforts, tireless guidance and for his patience and support to get this work into light.*

Last but not least, I dedicate this work to my family, whom without their sincere emotional support, pushing me forward this work would not have ever been completed.

Mohamed Hamed Abd El Aziz

List of Contents

List of Abbreviations

Abb.	Full term
AAG	Alpha 1 acid glycoprotein
ACLS	Advanced cardiovascular life support
ASRA	American society of regional anesthesia
CNS	Central nervous system
CSF	Cerebrospinal fluid
CVS	Cardiovascular system
Fe+2	Ferrous iron
Fe+3	Ferric iron
G	Gauge
GA	General anesthesia
H	Hour
Hb	Hemoglobin
IM	Intramuscular
IV	Intravenous
K+	Potassium
kg	Kilogram
LA	Local Anesthetics
ml	Milliliter
mm	Millimeter
n	Number
Na+	Sodium
NaHCO3	Sodium bicarbonate
NSAID	Non steroidal anti-inflammatory drugs
PACU	Post anesthesia care unit
PDPH	Postdural puncture headache
PNB	Pudendal nerve block
SD	Standard deviation
US	Ultrasound

List of Tables

List of Figures

List of Figures Cont...

List of Figures Cont...

Introduction

Although general anesthesia is the commonly used technique in children, regional anesthesia is used as an adjuvant for intraoperative and postoperative pain relief. Caudal analgesia is the most common regional technique performed in children. It has been used for many years as an adjuvant to general anesthesia and to provide postoperative analgesia for subumbilical procedures ***(Cyna et al., 2008).***

However in recent times, there is a trend toward the use of peripheral nerve blockade wherever applicable, given the lower incidences of adverse effects when used with neuroaxial techniques. Furthermore there may be specific anatomic variations or abnormalities which preclude the use of caudal blockade ***(Naja et al., 2013).***

Of the various peripheral nerve block techniques available, the pudendal nerve block is a new and rapidly evolving peripheral nerve block technique that provides effective analgesia during the postoperative period following penile surgeries. The intra and postoperative analgesic efficacy ofpudendal nerve block has been successfully described in adult patients undergoing penile surgeries and vaginal delivery in females ***(Naja et al., 2013).***

Few studies on children have been done by some authors who concluded that the use of pudendal nerve block is a good alternative in pediatric patients for postoperative pain management in penile surgeries. It can be performed using a landmark technique through transcutaneous using peripheral nerve stimulator or with ultrasound (US) guidance ***(Sahin et al., 2013).***

Aim of the Work

The aim of the study is to compare the effectiveness and safety of US guided pudendal nerve block versus caudal epidural block as a part of multimodal analgesia in children undergoing hypospadias surgery.

Chapter 1

Local Anesthetics

Introduction:

Local anesthetics (LA) are drugs that block conduction of electrical impulses in excitable tissues. These tissues include the nerve cells and myocytes (both cardiac and skeletal muscles). Analgesia and anesthesia occur as a result of the blockage of electrical impulses ***(Mumba et al., 2017).***

Nerve Conduction:

The resting membrane potential of a nerve cell is in the range of −60 to −70 mV. At rest, neurons are more permeable to potassium (K+) ions due to the presence of K+ leak channels. This explains why the resting neuronal membrane potential is closer to the equilibrium potential of K+ of −80 mV. The intracellular milieu of the nerve cell is negatively charged relative to the extracellular. Upon excitation of the nerve fibres, the electrical impulse propagates along the axon as a result of changes occurring in the adjacent membrane alternating from negative to positive values of about +50 mV due to rapid influx of Na+ ions. At an electrical potential of +50 mV, there is rapid efflux of K+ ions in an attempt to maintain electrical neutrality of the cell. To restore the resting membrane potential, the Na+/K+ ATPase pumps Na+ extracellularly, while the opposite happens to the K+. The conduction of impulses along nerve fibers occurs as small brief, localized spikes of depolarization on the surface of the