



**Comparative Study between Bupivacaine
Epidural Injection or Intravenous Fentanyl with
General Anesthesia for Intra operative Analgesia
during Major Abdominal Surgeries**

Thesis

Submitted for Partial Fulfillment of Master Degree in Anesthesia

By

Maye Mohsen Abdelsattar Alamir

M.B.B.CH (Ain Shams University)

Supervised By

Dr. Ahmed Abdel Qader Sayed Sheesh

Professor of Anesthesia, Intensive Care and Pain Management

Ain Shams University, Faculty of Medicine

Dr. Hanan Mahmoud Farag Awad

Assist. Prof. of Anesthesia, Intensive Care and Pain Management

Ain Shams University, Faculty of Medicine

Dr. Marwa Mostafa Mohamed Ali

Lecturer of Anesthesia, Intensive Care and Pain Management

Ain Shams University

**Faculty of Medicine
Ain Shams University**

2017



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قُلْ إِنِّ صَلَاتِي

وَنُفْسُكِي

وَمَحْيَايَ وَمَمَاتِي

لِلَّهِ رَبِّ الْعَالَمِينَ

صِرَاقَ اللَّهِ الْعَظِيمِ

سورة الأنعام الآية (١٦٢)



*First and foremost, thanks to **ALLAH** the most merciful and the most compassionate to whom I relate any success in achieving any work in my life.*

*Words cannot express my deep gratitude and sincere appreciation to **Dr. Ahmed Abdel Qader Sayed Sheesh**, Professor of Anesthesia, Intensive Care and Pain Management, Faculty of Medicine–Ain Shams University. I would like to express my great thanks for the attention she gave to this work from the very beginning to the very end of it. Her invaluable comments and remarks were of utmost importance to me.*

*I would like to express my very great appreciation to **Dr. Hanan Mahmoud Farag Awad**, Assist. Prof. of Anesthesia, Intensive Care and Pain Management Faculty of Medicine–Ain Shams University, for her help and valuable advice through out the performance of this work. I would like to express my very great appreciation to **Dr. Marwa Mostafa Mohamed Ali**, Lecturer of Anesthesia, Intensive Care and Pain Management, Faculty of Medicine–Ain Shams University, for her help and valuable advice throughout the performance of this work.*

Maye Mohsen

List of Contents

Title	Page No.
List of Contents	I
List of Abbreviations.....	Error! Bookmark not defined.
List of Tables	IX
List of Figures.....	X
Abstract	Error! Bookmark not defined.
Introduction	1
Aim of the Work.....	3
Review of Literature	
Physiology of pain and pain management	4
Introduction to Local Anesthetics	37
Patients and Methods.....	69
Results	79
Discussion.....	88
Summary	91
Conclusion	98
References	100
المخلص العربى.....	1

List of Abbreviations

Abb.	Full Term
AHCPR	Agency for healthcare policy and research
ASA	American society of Anaesthesiologists
BMI	Body Mass Index
BUN	Blood Urea Nitrogen
COX	Cyclo-Oxygenase enzyme
CYP2D6	Cytochrome P 2D6
CVS	Cardiovascular system
CN	Caudate nucleus
CBC	Complete blood count

List of Abbreviations

Abb.	Full Term
Ca	Calcium
CNS	Central nervous system
CPG	Clinical research practice guidance
DRG	Dorsal root ganglion
DR	Dorsal Raphe
ECG	Electrocardiogram
FMRI	Functional magnetic resonance imaging
GABA	Gamma amino butyric acid
5-HT	Serotonin

List of Abbreviations

Abb.	Full Term
HR	Heart rate
IM	Intramuscular
IV	Intravenous
INR	International Normalized Ratio
IVRA	Intravenous regional anaesthesia
JCAHO	Joint commission on accreditation of health care organizations
κ	Kappa
LAST	Local anaesthesia systemic toxicity
LA	Local anaesthesia

List of Abbreviations

Abb.

Full Term

Mg

Milligram

Mcg

Microgram

MABP

Mean arterial blood pressure

NRM

Nucleus raphe magnus

NMDA

N-methyl D –aspartic

NIBP

Non invasive blood pressure

List of Abbreviations

Abb.	Full Term
OR	Opoid rotation
PABA	Para amino benzoate
PT	Patient time
PTT	Partial thromboplastin time
PAG	Periaqueductal grey matter
RBS	Random Blood Sugar
RVM	Rostral ventromedial medulla
μ	Mu
δ	Delta
SPA	Stimulation produced analgesia

List of Abbreviations

Abb.	Full Term
SpO2	Oxygen Saturation
SIA	Stress induced Analgesia
SPT	Septal Nucleus
SNRI	Serotonin nor-adrenaline reuptake
TCA	Tricyclic antidepressant
VPL	Ventral postrolateral

List of Abbreviations

Abb.

Full Term

List of Figures

Fig (1): Ascending pain pathways. DRG dorsal root ganglion, PAG periaqueductal grey matter.....	8
Fig (2): Gate control theory of pain Stimulation of □□ fibers activates inhibitory interneurons in the dorsal horn.....	16
Fig (3): (Catterall WA & Mackie K., 2011).....	40
Fig (4):Midazolam ampoules 5 mg/ml.....	73
Fig (5): BRAUN Epidural Set Melsungen AG, 1.3mm 18 G Tuohy needle, Perifix 451 filter set.....	74
Fig (6): BRAUN Epidural Set Melsungen AG, 1.3mm 18 G Tuohy needle, Perifix 451 filter set.....	75
Fig (7): An 18 G short beveled Tuohy epidural needle.....	77
Fig (8): Bar chart between epidural and fentanyl according to sex.	81
Fig (9): Bar chart between epidural and fentanyl according to age (years).....	81
Fig (10): Bar chart between epidural and fentanyl according to ASA.....	82
Fig (11): Bar chart between epidural and fentanyl according to heart rate.....	84
Fig (12): Bar chart between epidural and fentanyl according to MABP.	Error! Bookmark not defined.
Fig (13): Bar chart between epidural and fentanyl according to blood sugar.....	Error! Bookmark not defined.

List of Tables

Table (1): Characteristics of primary afferent fibres	6
Table (2): pharmacological pain management and modulation.	21
Table (3): Comparison between epidural and fentanyl according to demographic data.	80
Table (4): Comparison between epidural and fentanyl according to heart rate (bpm). Error! Bookmark not defined.	
Table (5): Comparison between epidural and fentanyl according to MABP (mmHg).....	85
Table (6): Comparison between epidural and fentanyl according to blood sugar. Error! Bookmark not defined.	

Introduction

Pain relief has significant physiological benefits; hence, monitoring of pain relief is increasingly becoming an important postoperative quality measure. The goal for postoperative pain management is to reduce or eliminate pain and discomfort with a minimum of side effects. Various agents (opioid vs. nonopioid), routes (oral, intravenous, neuraxial, regional) and modes (patient controlled vs. “as needed”) for the treatment of postoperative pain exist. Although traditionally the mainstay of postoperative analgesia is opioid based, increasingly more evidence exists to support a multimodal approach with the intent to reduce opioid side effects (such as nausea and ileus) and improve pain scores (**Brennan et al., 2007**).

Epidural analgesia is a well-established technique for managing postoperative pain that has been in use for decades. Studies have shown that the technique has several additional benefits, such as decreased cardiovascular, pulmonary and gastrointestinal morbidity and mortality. These data in combination with international guidelines have led epidural analgesia to be considered the gold standard for pain management after major surgery. Although epidural