شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

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قسم

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Comparative Study between Intrathecal Fentanyl and Midazolam as Adjuvant to Local Anesthetics in Spinal Anesthesia in Elective Cesearean Section in Post-Operative Anesthesia and Post-Operative Analgesia

Thesis

Submitted for Partial Fulfillment of M. Sc. Degree

in ***Anesthesia, Intensive Care and Pain Management***

By

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2020

Acknowledgments

First and foremost, I feel always indebted to ***Allah*** *the Most Beneficent and Merciful.*

I wish to express my sincere thanks and deepest gratitude to ***Prof. Ahmed Ali Fawaz****, who taught me the milestones of this research work, and was abundantly helpful and offered invaluable assistance, support and guidance. Also I would like to thank him for his patience and his elegant teaching notes that helped me a lot.*

I am deeply thankful to ***Ass.Prof.Dr. Tamer Youssef Elie*** *for support, guidance and supervision.*

I am grateful and thankful to ***Dr. Wael Abd Elmoneim Mohamed Abdelwahab*** *for his guidance and assistance in our clinical pathology work and his supervision.*

I feel grateful for all my professors and colleagues for their friendship and professional collaboration.

Abdelrahman Ali Ali Gad Mattar

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List of Abbreviations

Abb.	Full term
ABC	*Airway / breathing / circulation*
ANOVA	*Analysis of variance*
CBF	*Cerebral blood flow*
$CMRO_2$	*Cerebral metabolic rate for oxygen*
CNS	*Central nervous system*
CS	*Ceserean section*
CVS	*Cardiovascular system*
GABA	*γ-amino-butyric acid*
HR	*Heart rate*
IOP	*Intraocular pressure*
MAP	*Mean arterial blood pressure*
MRI	*Magnetic resonance imaging*
NMDA	*N-methyl-d-aspartate*
PPSP	*Persistent postsurgical pain*
SA	*Spinal anaethesia*
SD	*Standard deviation*
VAS	*Visual analogue scale*

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INTRODUCTION

Spinal or intrathecal anesthesia has a long history of success and more popular, mostly because of an increasing number of ambulatory procedures and interventions, for which the ideal spinal anesthetic would provide rapid and adequate surgical anesthesia together with early ambulation and early discharge ***(Liu and McDonald, 2001)***.

More studies on bupivacaine have shown that it produces predictable and reliable spinal anesthesia for surgery ***(Gunaydin and Tan, 2010)***.

Various intrathecal adjuvants to local anesthetics are used. When local anesthetics are combined with opioids, the duration of analgesia is prolonged ***(Obara et al., 2003)***.

Fentanyl, a short-acting lipophilic opioid, is known to augment the quality of subarachnoid block. It was also shown that the addition of fentanyl to hyperbaric ropivacaine increased the intraoperative quality of spinal anesthesia in patients undergoing anorectal surgery, cesarean section ***(Chavada et al., 2009)***, and transurethral resection of the prostate ***(Shahriari et al., 2009)***.

However, worrisome adverse effects such as pruritus, urinary retention, postoperative vomiting, and respiratory depression limit the use of opioids ***(Wong et al., 2004; Chhabra et al., 2013)***.

Midazolam is a benzodiazepine with unique properties when compared with other benzodiazepines ***(Sadeh et al., 2012)***.

It is water soluble in its acid formulation but is highly lipid soluble *in vivo*. It has been reported to have a spinally mediated antinociceptive effect. Previous studies have shown that intrathecal administration of midazolam added to bupivacaine improves the duration and quality of spinal anesthesia ***(Kim and Lee, 2001; Gunaydin and Tan, 2010)***.

AIM OF THE WORK

This study is undertaken to evaluate and compare the effects of intrathecal midazolam (2 mg) and fentanyl (25 micrograms) as additives to intrathecal hyperbaric bupivacaine (0.5 %) with regards to:

- Onset and duration of sensory block.
- Duration of complete and effective analgesia.
- Side effects associated with the drug.

REVIEW OF LITERATURE

Anatomy of the vertebral column and the spinal cord

Anatomy of a Typical Vertebra

A typical vertebra can be divided into two basic regions: a vertebral body and a vertebral arch (also called the posterior arch or dorsal arch). The bone in both regions is composed of an outer layer of compact bone and a core of trabecular bone, also known as cancellous, or spongy, bone ***(Masharawi and Salame, 2011)***.

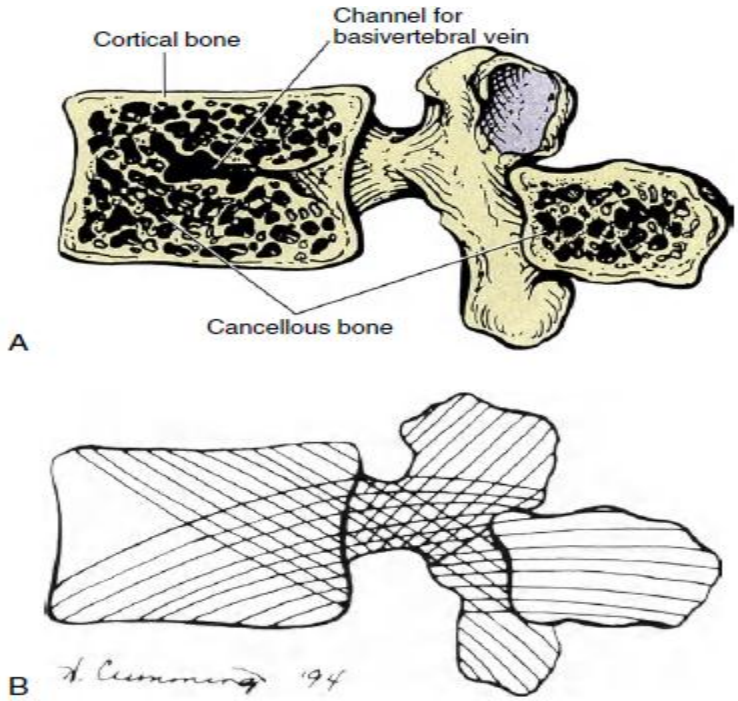

Figure 1: Midsagittal view of a vertebra. "**A,** The central cancellous, or trabecular, bone of the vertebral body and spinous process. Also notice the more peripheral cortical bone. **B,** The pattern of trabeculation, which develops along the lines of greatest stress" ***(Masharawi and Salame, 2011)***.

Vertebral Arch

The vertebral (posterior) arch has several unique structures. These include the pedicles, laminae, and superior articular, inferior articular, transverse, and spinous processes. Each of these subdivisions of the vertebral arch is discussed separately in the following sections ***(Goldberg and Kershah, 2010)***.

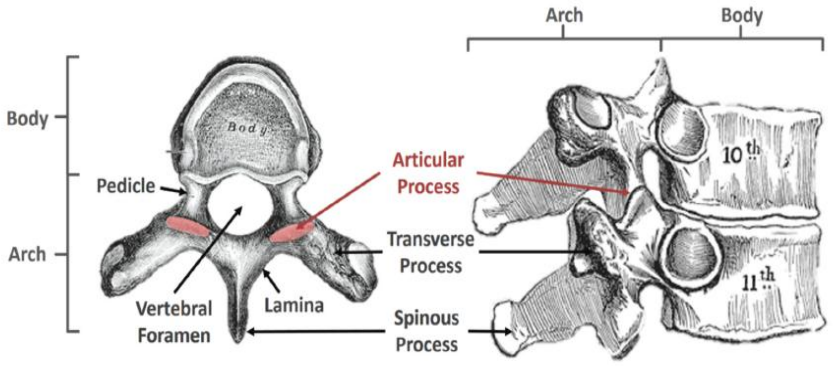

Figure 2: The basic anatomy of the vertebra with the major features labeled on representative thoracic vertebrae ***(Masharawi and Salame, 2011)***.

Vertebral Foramen and the Vertebral Canal

The vertebral foramen is the opening within each vertebra that is bounded by the structures discussed thus far. Therefore the vertebral body, the left and right pedicles, the left and right laminae, and the spinous process form the borders of the vertebral foramen in a typical vertebra. The size and shape of the vertebral foramina vary from one region of the spine to the next and even from one vertebra to the next ***(Daffner, 2011)***.