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شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم





جامعة عين شمس

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قسم

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The Effect of Intravenous versus Intra Thecal Dexamethazone in Bupivacaine Spinal Anesthesia on Postdural Puncture Headache (PDPH)

Thesis

Submitted for Partial Fulfillment of Master Degree in Anesthesiology, Intensive Care and Pain Management

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Tist of Abbreviations

Abb.	Full term
ADRsAdvers	e drug reactions
BMIBody n	
CNSCentra	
CSF Cerebr	·
CTCompi	-
CVCardio	
EBPEpidur	ral blood patch
FDAFood a	_
HRHeart	_
IVIntrave	enous
LALocal o	inesthetic
LASTLocal o	nesthetic systemic toxicity
LPLumba	r puncture
NSAIDNonste	roidal antiinflammatory drug
PDPHPost di	ıral puncture headache
PONVPostop	erative nausea and vomiting
PRPulse n	rate
RRRelativ	ve risk
SBPSystoli	c blood pressure
SPGBSphene	ppalatine ganglion block
SPO_2 Periph	eral oxygen saturation
SVRSystem	cic vascular resistance
TRITransi	ent Radicular Irritation
UDPUninte	ntional dural puncture

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Introduction

Spinal anesthesia is a popular method of anesthesia, used for many lower abdominal and lower limb surgeries. However, penetrating the meninges for local anesthetic injection into subarachnoid space may be associated with many undesirable effects (Onwochei et al., 2017). Post dural puncture headache (PDPH) is one of the most frequent side effect of spinal anesthesia. It may be mild self-limited or severe distressing, affecting the life style of the patient. There have been studies to determine the pathogenesis and possible causes of PDPH (Arevalo-Rodriguez et al., 2016). But till now, the pathophysiology of PDPH is still unclear. It's supposed that cerebro spinal fluid (CSF) leakage through the dural puncture may lead to decreased CSF volume and pressure. However, the relationship between the low CSF pressure and volume and (PDPH) is yet unclear (Zorrilla-Vaca et al., 2018). Another theory suggests that loss of CSF activates adenosine receptors which lead to vasodilatation and headache (Sen and Sen, *2014*).

For PDPH, conservative measures such as hydration and bed rest should be started immediately but these measures have a history of being not very effective. Therefore, other numerous strategies have been suggested. Some are non-invasive such as giving caffeine. Others are invasive such as epidural morphine injection or to replace CSF or to seal the dural puncture site by



epidural saline bolus, epidural colloid or blood patch (Parris, *1989*).

Dexamethazone is widely used in anesthetic practice; as anti-inflammatory, antiemetic and analgesic. Dexamethasone has been used intra-thecally as an adjuvant to local anesthetics, and intravenously to produce analgesia and sedation, with improving the outcome of PDPH (Marinangeli et al., 2002). However, no studies have been conducted to compare between intrathecal versus intravenous dexamethazone for prevention of PDHD.

AIM OF THE WORK

So, the aim of this study was to compare the effect of IV dexamethasone (8 mg) versus intrathecal dexamethasone (4 mg) as adjuvant to bupivacaine, on post dural puncture headache (PDPH), in surgeries of lower abdomen and lower limb.

Review of literature BASIC ANATOMY

o understand the pharmacokinetic, pharmacodynamic, and pharmacotherapeutic activity of local anesthetics in neuraxial region, one needs a thorough understanding of neuraxial anatomy. The term "neuraxis" refers to the axial unpaired portion of the central nervous system. Of great importance of neuraxial anesthesia is the spinal cord, nerve roots, and the meninges and vertebral bodies that house and protect them (*Broadbent et al.*, 2010).

A. Membranes

The spinal cord is surrounded by three protective membranes or meninges, which delineate potential and actual neuraxial spaces. From outermost to innermost, these membranes are the dura mater, the arachnoid mater and the pia mater. The pia mater directly envelops the spinal cord. Epidural refers to the potential space between the ligamentum flavum and outer surface of the dura mater. Subdural refers to a potential space between dura mater and arachnoid mater. The term intrathecal refers to the thecal sac or the dura mater enclosure of the cerebrospinal fluid-filled sub-arachnoid (i.e., subarachnoid mater) space. This space is outside the pia mater. These spaces are surrounded by bony architecture created by the vertebrae (**Figure 1**) (*Margarido et al., 2011*).

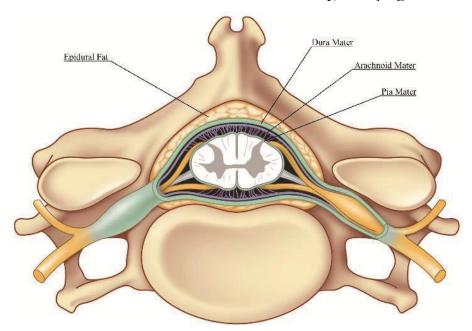


Figure (1): Meninges—protective membranes of the spinal cord *(Margarido et al., 2011).*

B. Bones and ligaments

The vertebral column protects the spinal cord and provides support for standing and walking. It has 3 curvatures (cervical lordosis, thoracic kyphosis, and lumbar lordosis) and 5 regions; cervical, thoracic, lumbar, sacral and coccygeal, which consist of 7, 12, 5, 5, and 4 vertebrae respectively for a total of 33. Each vertebra consists of two components: a vertebral body and vertebral arch. The vertebral arch is composed of laminae, pedicles, spinous, and transverse processes (**Figure 2**) (*Saifuddin et al.*, 2011).

Variation in bony structure between lumbar, thoracic, and cervical vertebrae will dictate the approach to these specific