بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

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MONA MAGHRABY

Effects of Delayed Supine Positioning after Induction of Subarachnoid Block on Prevention of Post-spinal Hemodynamic Changes Compared to Traditional Subarachnoid Block

Thesis

Submitted for the Fulfillment of the Master Degree in Anesthesiology

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Karim Saad

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List of Abbreviations

Abb.	Full term
ASA	American Society of Anesthesiologists
CSF	Cerebro-Spinal Fluid
DBP	Diastolic Blood Pressure
HR	Heart Rate
IV	Intravenous
Kg	Kilogram
MAP	Mean Arterial Pressure
mg	Milligram
NIBP	Non-Invasive Arterial Pressure
P-value	Probability value
SAB	Subarachnoid Space
SBP	Systolic Blood Pressure
SD	Standard Deviation
SVR	Systemic Vascular Resistance

INTRODUCTION

Knee Arthroscope is considered as the surgical gold standard for the treatment of patients complaining of Knee Osteoarthritis ***(Feng., 2016).***

Spinal anaesthesia is a commonly used anaesthetic technique for knee arthroscope for its efficiency, speed, minimal effects on mental state, protection against thromboembolic complications, early mobilisation after surgery, minor respiratory complications, continuous analgesia and shorter hospital stay ***(Vega., 2016).***

One of the most important advantages of the subarchnoid block (SAB) is the prevention of volume overload due to peripheral pooling of the blood ***(Akcaboy., 2012).***

Spinal anesthesia also allows continuous monitoring of the patient's level of consciousness.

On the other hand, subarachnoid block has some disadvantages. The most serious disadvantage is postspinal hemodynamic changes which is the main concern of the anesthesiologists especially in high risk cardiac and elderly patients.

Elderly patients are more sensitive to changes in preload and fluid kinetics, due to the less effective response of the baroreceptors decreasing the capacity of response to haemodynamic changes ***(Singh., 2010).***

Spinal anesthesia causes medical sympathectomy to 4-6 dermatomes above the sensory level. So peripheral pooling of the blood reduces venous return and consequently cardiac output will decrease leading to hypotension. Abruptly bradycardia is one of the uncommon but fatal complication of spinal anesthesia and may occur at the any stage ***(Rooke., 2008).*** We usually guard against this hypotension by IV fluids 500 – 1000 ml(10–20ml/kg) and vasopressors as ephedrine increments 5mg. IV fluids should not be used freely specially in elderly patients with cardiac troubles (6–8ml/kg) ***(Rooke., 2008).***

An Anatomic overview on the knee joint nerve supply will be of value. The nerve supply to the knee is derived from:

- Branches of the femoral nerve to vastus medialis, intermedius, and lateralis
- Genicular branches of the tibial and common peroneal nerves
- Branch from the posterior division of the obturator nerve, considering this innervation, the height of the block up to T10 is enough for Knee arthroscope operation ***(Bessede.,2016).***

Many factors (baricity of anesthetic solution, age, position of the patient, drug dosage, site of injection, drug volume) affect the height of the block following spinal anesthesia and There is no dose specification for segmental spread in spinal anesthesia. Touminen stressed that

concentration and volume of local anesthetics along with position during and after injection are the major factors affecting the level of the block ***(Tuominen.,2005).***

The administration of 15 mg of 0.5% hyperbaric bupivacaine produce less fall of blood pressure compared to other local anesthetics and hemodynamic changes may be very low if enough pre-hydration is provided ***(Pitkanen.,2007).***

We hypothesize that delayed supine positioning after induction of subarachnoid block will be of value. As lower level of block is achieved, hemodynamic derangement is less and fluid requirement is also less, so there is minimal chance for circulatory overload.

Considering all these advantages and disadvantages of regional block, the aim of our study is to compare the hemodynamic changes, vasopressor requirement and adequate surgical condition between traditional subarachnoid block and delayed positioning after induction of subarachnoid block for knee arthroscope operation.

AIM OF THE WORK

The aim of our study is to compare the hemodynamic changes, vasopressor requirement and adequate surgical condition between traditional subarachnoid block and delayed positioning after induction of subarachnoid block for knee arthroscoe operation.

Chapter 1

PHYSIOLOGICAL CONTROL OF BLOOD PRESSURE

The systemic vasculature is composed of arteries, arterioles, capillaries and veins. Most of the blood is in the systemic circulation specifically the systemic veins. These systemic veins act as reservoir for blood ***(Colson.,2000).***

Table (1): Distribution of bood volume.

Heart(7%)
Pulmonary circulation (9%)
Systemic circulation:
Arterial(15%)
Capillaries(5%)
Venous(64%)

(Ganon.,2001)

Autonomic nervous system plays a major role regulating these veins according to the general status.

For example, with massive blood loss these veins receives sympathetic stimulation that causes vasoconstriction and allows shifting of blood into other parts of the systemic circulation to supply the most important organs. Conversely venodilataion allows these veins to accommodate for the increase in blood volume***(Ganon., 2001)***