Implication of Bupivacaine volume changes on the duration and rate of complications of femoral and/or sciatic nerve block for lower limb surgery

Thesis

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Presented by

Walid Youssef Youssef Kamel
M.B.B.Ch., M.Sc. Anaesthesiology
Faculty of Medicine -Ain Shams University

Under supervision of

Professor Dr. Raafat Abdel-Azim Hammad Ismail
Professor of Anaesthesia,Intensive Care and pain management
Faculty of Medicine-Ain Shams University

Professor Dr. Mervat Mohammed Marzok
Professor of Anaesthesia, Intensive Care and pain management
Faculty of Medicine-Ain Shams University

Dr. Ehab Hamed Abd El Salam
Assistant Professor of Anaesthesia, Intensive Care and pain management
Faculty of Medicine-Ain Shams University

Dr. Sahar Mohammed Talaat
Lecturer of Anaesthesia, Intensive Care and pain management
Faculty of Medicine-Ain Shams University

Faculty of medicine
Ain shams university
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Aim of work

To study the implication of volume change of Bupivacaine used to block femoral and/or sciatic nerve on the duration of motor and sensory blocks for early ambulation of the patient as well as associated complications.

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List of Abbreviations

ASB	anterior approach to the sciatic nerve block
Bpm	beat per minute
Cm	centimeter
CNS	central nervous system
CVS	cardiovascular
DHS	Dynamic hip screw
e.g	for example
Epi	epinephrine
Fe2+	ferrous iron
Fe3+	Ferric iron
G	gauge
HR	heart rate
Hrs	hours
HS	Highly significant
IQR	interquartile range
L	lumbar
LA	Local anaesthetics
Min	minute
n %	number percent
NS	Non significant
PABA	para-aminobenzoic acid
Paco2	arterial carbon dioxide tension
r	correlation coefficient
S	sciatic
S	Significant
SD	standard deviation
VAS	Visual analogue scale
Vs	versus
yr	year

Introduction

The importance of peripheral regional anaesthesia is rapidly growing ***(Bleckner and Buckenmaier, 2007)***.

A large spectrum of surgical and pain-related cases are managed with peripheral nerve blocks ***(Buckenmaier and Bleckner, 2008).***

The most important prerequisites for the use of peripheral regional anaesthesia in the daily clinical practice are success rates and safety. Both issues are closely related to the administered volumes of local anaesthetics ***(Latzkel et al., 2010).***

During the past decades, large volumes of local anaesthetics have been used for peripheral regional anaesthetic techniques to compensate for morphometric methods of nerve identification. Pure landmark-based, surface nerve mapping or nerve stimulation techniques may serve as examples of indirect methods of identification of peripheral nerves. As a consequence, upper limb blocks have been described with volumes up to 70 ml ***(Janzen et al., 2001***), lower limb blocks with volumes up to 40 ml of local anesthetics ***(Fanaelli et al., 1999)*** and sciatic nerve blocks are also performed with large

volumes of local anaesthetics, and descriptions vary from 15 to 35 ml ***(Greengrass et al., 1998 and Taboada et al., 2004).***

However, a transiently insensate limb is a well-recognized effect of perineural local anaesthetic infusion ***(White et al., 2003 and Rodriguez et al., 2006).***

It is postulated that an insensate extremity is best minimized during continuous peripheral nerve blocks because insensate limbs may be prone to accidental injury ***(Capdevila et al., 2006).***This concern of injury has resulted in recommendations to protect the surgical extremity in a sling and/or brace and use crutches or walkers (lower extremity surgery) for the duration of infusion ***(Boezaart, 2006).***Some have suggested delaying hospital discharge until sensation returns ***(Rodriguez et al., 2006).***

Compared with opioid analgesic, peripheral nerve block provides superior analgesia and improved functional outcomes with a lower incidence of nausea, vomiting, pruritus and sedation. The patient with continuous peripheral nerve blocks also has higher patient satisfaction scores ***(Siddiqui et al., 2007).***

In lower extremities surgery, peripheral nerve block provides a similar degree of analgesia to neuroaxial blockade

with less pruritus, hypotension, urinary retention, and lateralization of the blockade to the contralateral side ***(Zarik et al., 2006 and Raimer et al., 2007)***.

Compared with single injection peripheral nerve block, continuous peripheral nerve block carries a higher risk of infection ***(Raad et al., 2007***), a higher like hood of haematoma formation because of the large caliber of the needle ***(Wiegel et al., 2007)***, more technical problems related to the placement of the catheter ***(Burgher and Hebi, 2007)*** and its subsequent infusion period, but probably no difference in the rate of neurological injury ***(Wiegel et al., 2007).***