شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

# بسم الله الرحمن الرحيم


HANAA ALY

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# جامعة عين شمس

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# قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

# يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

# Dexamethasone As a Bupivacaine Adjuvant for Ultrasound Guided Interscalene Brachial Plexus Block

Thesis

***Submitted for Partial Fulfillment of Medical Degree in Anesthesia***

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بسم الله الرحمن الرحيم

# قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم

صدق الله العظيم

سورة البقرة الآية: ٣٢

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*Maha Abd el Fattah Metawie Badran*

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# List of Abbreviations

| Abb. | Full term |
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| *BMI* | *Body mass index* |
| *BP* | *Brachial plexus* |
| *CNS* | *Central nervous system* |
| *ECG* | *Monitoring included electrocardiography* |
| *EtCo2* | *End-tidal carbon dioxide* |
| *HR* | *Heart rate* |
| *IV* | *Intravenous* |
| *LAS* | *Local anesthetics* |
| *NIBP* | *Non-invasive blood pressure* |
| *NMDA* | *N-Methyl- d-aspartate* |
| *PACU* | *Post anesthesia care unit* |
| *PEG* | *Percutaneous electrode guidance* |
| *PNB* | *Peripheral nerve block* |
| *SA* | *Subclavian artery* |
| *Sao2* | *Arterial oxygen saturation* |
| *SCM* | *Sternocleido mastoid* |
| *SD* | *Standard deviation* |
| *STS* | *Spectral tissue sensing* |
| *VAS* | *Visual Analog Scale* |

# INTRODUCTION

Optimal postoperative pain management demands a thorough understanding of the pain pathophysiology, invasiveness of the surgical procedure, and patient factors associated with increased pain, such as anxiety and depression. The use of multimodal perioperative pain management provides a rational basis for enhanced postoperative pain control decreased adverse effects, and improved patient satisfaction ***(Lovich-Sapola et al. 2015).***

In particular, handling postoperative pain after shoulder surgery remains a challenge to both anesthesiologists and orthopedic surgeons. In an attempt to improve analgesia, interscalene brachial plexus block can be used either as an adjunct to general anesthesia or as the primary anesthetic ***(Chun et al. 2016).***

Several drugs have been studied as adjuvants for regional anesthesia such as epinephrine, clonidine, opioids, and ketamine. They have been evaluated for their effects on anesthesia and analgesia, but the results have conflicted depending on the drug used and the choice of local anesthetic ***(Vieira et al. 2010).***

Because of the limited efficacy or questionable toxicity of the previously studied drugs, some investigators evaluated glucocorticoids as adjuvants for regional anesthesia.

Known for their anti-inflammatory, analgesic, immunosuppressive, and antiemetic properties, they exert their action by inhibiting phospholipase A2, in addition to changes in cell function induced by glucocorticoid receptor activation. Furthermore, the literature suggests that a single perioperative dose of glucocorticoid is safe ***(Albrecht et al. 2015).***

Whether dexamethasone would prolong regional anesthesia is a subject of much discussion. Steroids induce a degree of vasoconstriction, acting like epinephrine by decreasing local anesthetic absorption. Another hypothesis is that dexamethasone may act locally on nociceptive C-fibers to increase the activity of inhibitory potassium channels, thus decreasing their activity ***(Chun et al. 2016).***

# Aim of the Work

To evaluate the efficacy of dexamethasone as an adjuvant to bupivacaine on the duration of the interscalene brachial plexus block in patients undergoing orthopedic upper limb surgeries.

*Chapter 1*

# ANATOMY OF BRACHIAL PLEXUS

The brachial plexus is composed of nerves formed by the roots of the cervical and thoracic spinal cord. It originates in the posterior neck triangle and travels into the upper limb. Anatomically, it lies in the area of the thoracic outlet, between the 1st rib & the clavicle. The brachial plexus extends from scalene anterior muscle lateral border to the pectoralis minor inferior border ***(Polcaro and Daly, 2019).***

The brachial plexus is formed by the anterior primary rami of C5 through T1 & provides sensory & motor innervation of the shoulder and upper limb. it is divided, into rami/roots, trunks, divisions, cords, & terminal branches. The brachial plexus, together with axillary artery, form a large neurovascular bundle that travels in the axilla to supply the upper limb ***(Polcaro and Daly, 2019).***

The roots originate from the anterior rami of cervical spinal nerves C5 through C8 and the 1st thoracic spinal nerve T1 as shown in figure(1) ***(Netter, 2014)***. Variations include having a ‘‘prefixed’’ plexus that originates from C4 through C8 or a ‘‘post fixed’’ plexus that originates from C6 through C8 and T1 to T2 ***(Ellis, 2004).***