بسم الله الرحمن الرحيم

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بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لايوجد

Dexmedetomidine versus Magnesium Sulphate as an Adjuvant to Local Anesthesia in Single-Injection Percutaneous Peribulbar Anesthesia for Cataract Extraction

Thesis

Submitted for Partial Fulfillment of M.D. in Anesthesiology, Intensive Care and Pain Management

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بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

﴿وَعَلَّمَكَ مَا لَمْ تَكُنْ تَعْلَمُ وَكَانَ فَضْلُ اللَّهِ عَلَيْكَ عَظِيمًا﴾

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Aya Abuelyossr

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List of Abbreviations

Abb.	Full term
ACLS	Advanced cardiac life support
ASRA	American Society of Regional Anesthesia
ASA	American society of Anesthesia
AXL	Axial length
CBC	Complete blood count
CNS	Central nervous system
CONSORT	Consolidated Standards of Reporting Trials
CPR	Cardiopulmonary resuscitation
CVS	Cardiovascular system
ECG	Electrocardiogram
HA	Hyaluronan
ICU	Intensive care unit
IOP	Intra ocular pressure
IP	Indian Pharmacopoeia
IU	International unit
IV	Intravenous
KFT	Kidney function tests
LA	Local anesthetic
LFT	Liver function tests
$MgCl_2$	Magnesium chloride
$MgSO_4$	Magnesium sulfate
NMDA	N-methyl-D-aspartate
PACU	Postanesthesia care unit
pCO_2	Partial Pressure of Carbon Dioxide
PT	Prothrombin time

List of Abbreviations Cont...

Abb.	Full term

PTT ..... Partial thromboplastin time

RBA ..... Retrobulbar anesthesia

RBS..... Random blood sugar

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INTRODUCTION

Regional anesthesia is the preferred type of anesthesia for eye surgeries because it is safer, especially in elderly patients who are candidates for the ophthalmic surgeries. They usually have multiple systemic diseases making them more liable for anesthetic complications. Also it is associated with less incidence of nausea and vomiting so it is more suitable for day case surgery ***(Mohamed and Genidy, 2017).***

Peribulbar block is a popular choice for patients undergoing cataract surgery. Several studies have demonstrated that peribulbar block provided optimal conditions for cataract surgery ***(Ripart et al., 2005).***

The use of a 25-mm needle is the standard practice for extraconal injections. The single-injection technique for percutaneous peribulbar anesthesia with a short needle has been proved to be a simple and easy-to-perform technique with less pain, using a decreased volume of local anesthetic. It requires a single puncture instead of multiple punctures providing adequate analgesia and akinesia ***(Ghali et al., 2011).***

Dexmedetomidine is a sedative that works by acting as a centrally acting, highly selective α2-agonist. It has also been used as a supplement to local anesthetics in peripheral nerve block, brachial plexus block, subarachnoid anesthesia, and late peribulbar block, with proven efficacy and safety ***(Gandhi et al., 2012).***

Magnesium is a noncompetitive N-methyl-D-aspartate (NMDA) receptor antagonist that reduces excitatory post-synaptic currents and represses voltage-gated calcium channels. It has been used as an adjunct to local anesthetic mixtures in a variety of regional anesthesia modalities to enhance anesthesia quality and duration ***(Elyazed & Mostafa, 2017).***

Both medications have been used as adjuvants to peri-bulbar anesthesia previously, at various concentrations and in various surgeries, with varying findings in terms of the quality of the block ***(Mohamed & Genidy, 2017; Shoukry & Abd el Kawy, 2018).***

AIM OF THE WORK

The aim of this study is to investigate the effect of adding dexmedetomidine or magnesium sulphate to the anesthetic mixture in peribulbar block in enhancing the quality & the duration of the local anesthethia as a primary goal as well as to compare between the effects of dexmedetomidine versus magnesium sulphate as an adjuvants to single-injection peribulbar anesthesia as a secondary goal.

Chapter 1

APPLIED ORBITAL ANATOMY

A detailed understanding of orbital anatomy is required to avoid inadvertent damage to important ocular structures with the associated risk of permanent visual impairment ***(Anker and Kaur, 2017).***

The Bony Orbit

Each orbit is in the shape of an irregular pyramid with its base at the front of the skull and its axis pointing postereo-medially towards the apex. At the apex lies the optic foramen, transmitting the optic nerve and accompanying vessels and the superior and inferior orbital fissures transmitting the other nerves and vessels ***(Chishti and Varvinskiy, 2009).***

The borders and anatomical relations of the bony orbit are as follows:

- *Roof (superior wall)*: Formed by the frontal bone and the lesser wing of the sphenoid. The frontal bone separates the orbit from the anterior cranial fossa.
- *Floor (inferior wall)*: Formed by the maxilla, palatine and zygomatic bones. The maxilla separates the orbit from the underlying maxillary sinus.

- *Medial wall*: Formed by the ethmoid, maxilla, lacrimal and sphenoid bones. The ethmoid bone separates the orbit from the ethmoid sinus.

- *Lateral wall*: Formed by the zygomatic bone and greater wing of the sphenoid.

- *Apex*: Located at the opening to the optic canal, the optic foramen.

- Base – Opens out into the face and is bounded by the eyelids. It is also known as the orbital rim ***(Turvey and Golden, 2012).***

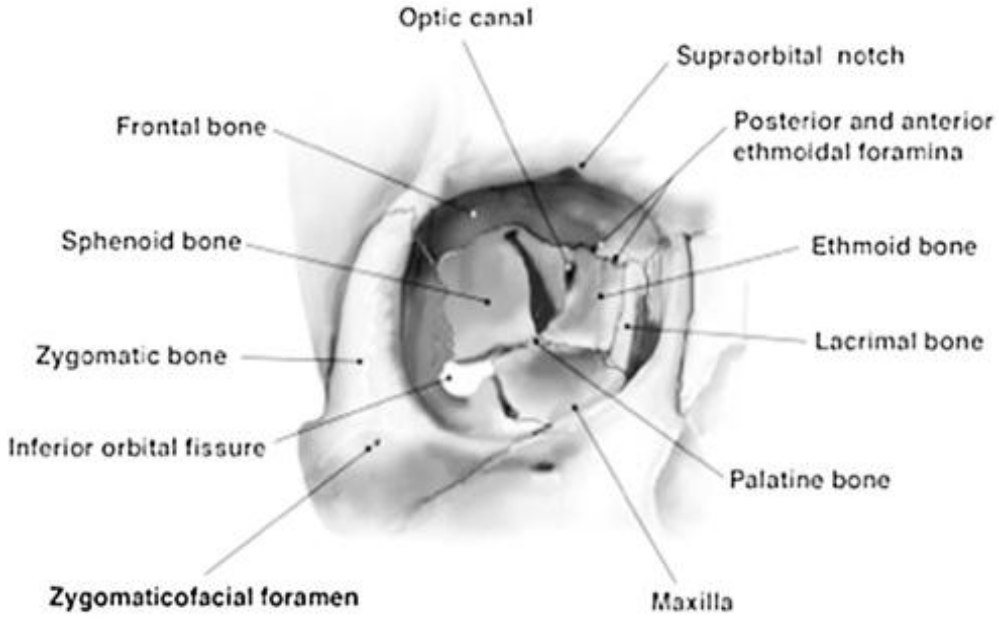

Figure (1): The bony orbit ***(Turvey and Golden, 2012).***