



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



MONA MAGHRABY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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



MONA MAGHRABY



Bleeding Tendency in People who Anesthetized with Sevoflurane VS those Anesthetized with Isoflurane

Thesis

*Submitted for Partial Fulfillment of
Master Degree in Otorhinolaryngology*

By

Mohammed Elsayed Salem Elsayed

*M.B.B.Ch., Ain Shams University
Resident of Otorhinolaryngology, Ain Shams University Hospital*

Under Supervision of

Prof. Dr. Talaat Elsamny

*Professor of Otorhinolaryngology
Faculty of Medicine, Ain Shams University*

Prof. Dr. Tamer Shoukry

*Professor of Otorhinolaryngology
Faculty of Medicine, Ain Shams University*

Dr. Mohamed Nageeb

*Lecturer of Otorhinolaryngology
Faculty of Medicine, Ain Shams University*

Faculty of Medicine, Ain Shams University

2020

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ

سُبْحَانَكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

صدق الله العظيم

سورة البقرة الآية: ٣٢

Acknowledgments

*First and foremost, I feel always indebted to **Allah** the Most Beneficent and Merciful.*

*I wish to express my deepest thanks, gratitude and appreciation to **Prof. Dr. Talaat Elsamny**, Professor of Otorhinolaryngology, Faculty of Medicine, Ain Shams University, for his meticulous supervision, kind guidance, valuable instructions and generous help.*

*Special thanks are due to **Prof. Dr. Tamer Shoukry**, Professor of Otorhinolaryngology, Faculty of Medicine, Ain Shams University, for his sincere efforts, fruitful encouragement.*

*I am deeply thankful to **Dr. Mohamed Mageeb**, Lecturer of Otorhinolaryngology, Faculty of Medicine, Ain Shams University, for his great help, outstanding support, active participation and guidance.*

*Special thanks to **Dr. Hala Salah Eldein**, Lecturer of Anesthesia, Faculty of Medicine, Ain Shams University, for her great help.*

I would like to express my hearty thanks to all my family for their support till this work was completed.

Mohammed Elsayed Salem Elsayed

List of Contents

Title	Page No.
List of Tables.....	5
List of Figures	7
List of Abbreviations.....	9
Introduction	- 1 -
Aim of the Work	3
Review of Literature	
▪ Anatomy of Tonsils	4
▪ Function of Tonsils and Adenoids.....	9
▪ Tonsillitis	28
▪ Pharmacology of Sevoflurane and Isoflurane	39
Patients and Methods.....	45
Results.....	51
Discussion	66
Summary and Conclusion	72
Recommendations	74
References	75
Arabic Summary	

List of Tables

Table No.	Title	Page No.
Table 1:	Comparison between the 2 groups as regards clinical data using Mann-Whitney's U and Chi square tests:.....	51
Table 2:	Comparison between the 2 groups as regards clinical data using Mann-Whitney's U and Chi square tests:.....	52
Table 3:	Comparison between the 2 groups as regards baseline laboratory data using Mann-Whitney's U test:.....	52
Table 4:	Comparison between the 2 groups as regards surgical data using Mann-Whitney's U test:.....	53
Table 5:	Comparison between the 2 groups as regards bleeding outcome data using Mann-Whitney's U test:.....	55
Table 6:	Comparison between ISO group and SEVO group regarding perioperative pain	57
Table 7:	Comparison between ISO group and SEVO group regarding recovery	57
Table 8:	Comparison between ISO group and SEVO group regarding operative stay	58
Table 9:	Spearman's correlation analysis for baseline clinical / laboratory / surgical Factors associated with amount of blood loss:.....	60
Table 10:	Spearman's correlation analysis for baseline clinical / laboratory / surgical Factors associated with number of used packs:.....	61

List of Tables cont...

Table No.	Title	Page No.
Table 11:	Multiple regression model for the Factors affecting amount of blood loss using Forward method:.....	62
Table 12:	Multiple regression model for the Factors affecting number of used packs using Forward method:.....	63
Table 13:	Roc-curve of Isoflurane to predict amount of blood loss:	64
Table 14:	Roc-curve of Isoflurane to predict number of used packs:	65

List of Figures

Fig. No.	Title	Page No.
Figure 1:	Anterior view of the oral cavity	5
Figure 2:	Structure of various tissue elements that are important for the immunological functions of tonsils	11
Figure 3:	Distribution and behavior of B and T lymphocytes and cues directing their compartmentalization within human tonsils	12
Figure 4:	Immune events taking place in the dark and light zones of tonsillar germinal center	16
Figure 5:	Various phenotypes of tonsillar germinal center (GC) T and B cells as well as distribution of the CD40 and CD28 costimulatory molecules on a variety of tonsillar cells	18
Figure 6:	Schematic representation of lymphoid follicle (B-cell area)	19
Figure 7:	Immunoglobulin class-switch recombination leading to differentiation of B cells in tonsils	21
Figure 8:	Putative scheme for compartmentalized mucosal B-cell homing from inductive (top) to effector (bottom) sites in humans	25
Figure 9:	Intrafollicular and extrafollicular IgG+ and IgA+ plasmablasts and plasma cells (PCs)	27
Figure 10:	A culture positive case of Streptococcal pharyngitis with typical tonsillar exudates	31

List of Figures cont...

Fig. No.	Title	Page No.
Figure 11:	Tonsillectomy operational technique.	48
Figure 12:	Comparison between the 2 groups as regards operative time.	54
Figure 13:	Comparison between the 2 groups as regards blood loss.	56
Figure 14:	Comparison between the 2 groups as regards packs used.	56
Figure 15:	Comparison between ISO group and SEVO group regarding recovery	58
Figure 16:	Comparison between ISO group and SEVO group regarding operative stay	59
Figure 17:	Correlation between amount of blood loss and operative time.	61
Figure 18:	Correlation between number of used packs and operative time.	62
Figure 19:	ROC curve of Isoflurane (blood loss).	64
Figure 20:	ROC curve of Isoflurane (number of used packs).	65

List of Abbreviations

Abb.	Full term
<i>AEA</i>	<i>Arachidonylethanolamine</i>
<i>AID</i>	<i>Activation-induced cytidine deaminase</i>
<i>ASO</i>	<i>Antistreptolysin O</i>
<i>BlimP-1</i>	<i>B lymphocyte-induced maturation protein 1</i>
<i>CSR</i>	<i>Class-switch recombination</i>
<i>DCs</i>	<i>Dendritic cells</i>
<i>FDCs</i>	<i>Follicular dendritic cells</i>
<i>GABHS</i>	<i>Group A β-hemolytic streptococcus</i>
<i>GCs</i>	<i>Germinal centers</i>
<i>HEVs</i>	<i>High endothelial venules</i>
<i>HLA</i>	<i>Human leukocyte antigen</i>
<i>Ig</i>	<i>Immunoglobulin</i>
<i>Ig V</i>	<i>Ig variable</i>
<i>MALT</i>	<i>Mucosa-associated lymphoid tissue</i>
<i>NALT</i>	<i>Nasopharynx-associated lymphoid tissue</i>
<i>NMDA</i>	<i>N-methyl-D-aspartate receptor</i>
<i>NMR</i>	<i>Nuclear Magnetic Resonance</i>
<i>NSAIDs</i>	<i>Nonsteroidal anti-inflammatory drugs</i>
<i>PANDAS</i>	<i>Pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections</i>
<i>PCs</i>	<i>Plasma cells</i>
<i>PNAd</i>	<i>Peripheral lymph node addressin</i>
<i>Tfh</i>	<i>T follicular helper cells</i>
<i>Th</i>	<i>Helper T</i>

Abstract

Background & Purpose: The effects of desflurane and sevoflurane, two commonly used inhalation anesthetics for the maintenance of general anesthesia, on peri- and postoperative bleeding is a focus of interest. This study conducted to evaluating that; Sevoflurane can cause bleeding tendencies more than Isoflurane anesthesia or not?

Study design: Prospective, randomized comparative study.

Setting: Ain shams university hospitals.

Subjects: We included 40 tonsillectomy patients (age from 2 – 12 years old), and classified them according to the anesthetic drug used into 2 independent groups: Isoflurane group (20 patients) and Sevoflurane group (20 patients).

Methods: All patients were subjected to full history taking, oral cavity examination, anterior rhinoscopy nasal examination, basic laboratory studies for bleeding tendencies (e.g. platelets and INR), adenoidal-tonsillectomy operational data (including operative time calculation), bleeding outcomes (blood loss and packs of blood transfusion) will be recorded, and half of the cases will be anesthetized with sevoflurane and another half with isoflurane.

Results: In the studied population, the mean age of all patients was (7.1 ± 2.7) years, with (57.5%) of patients were males; while (42.5%) were females. Regarding bleeding outcome data; the average blood loss of all patients was (15.5 ± 3.7) cc, and the average packs used were (4.2 ± 1.1). We found a significant decrease in operative time in the Isoflurane group; compared to the Sevoflurane group ($p = 0.0017$). Regarding Bleeding outcome data; we found, a significant decrease in blood loss, in the Isoflurane group; compared to the Sevoflurane group ($p = 0.00014$), and a significant decrease in the number of packs used, in Isoflurane group; compared to Sevoflurane group ($p = 0.0018$).

Conclusion: To conclude, anesthesia with isoflurane can lead to a lower amount of intraoperative bleeding compared with sevoflurane. Therefore, isoflurane may be preferred as an inhalational agent for the maintenance of general anesthesia during tonsillectomy and adenoidectomy operations.

Keywords: Bleeding Tendency, Anaesthesia, Sevoflurane, Isoflurane.

INTRODUCTION

Until today, tonsillectomy techniques have been blamed for the bleeding and pain after tonsillectomy operations and, postoperative and intra-operative complications have been attributed to the technique used. Comparisons were made between the techniques and the studies mostly emphasized the identification of the better technique (*Ashbach et al., 2007*).

The effects of isoflurane and sevoflurane, two commonly used inhalation anesthetics for the maintenance of general anesthesia, on peri- and postoperative bleeding is a focus of interest ((*Scheller, 1992; Loscar and Conzen, 2004*).

In clinical and experimental studies performed in animals and human beings, isoflurane was compared with the other volatile anesthetics in terms of cardiovascular effects, and it was found that isoflurane dose-dependently reduced the systemic vascular resistance. Reduction in cardiac output may also be seen with higher doses (*Scheller, 1992; Loscar and Conzen, 2004*).

Platelet aggregation induced by ADP, epinephrine, arachidonic acid, Prostaglandin G2 and Thromboxane A2 receptor agonists was shown to be suppressed by sevoflurane (*Hirakata et al., 1995*). This inhibition is caused by the suppression of thromboxane A2 and the suppression of cyclooxygenase. The antiaggregant effects of sevoflurane are

reversible (*Hirakata et al., 1996*). However, desflurane does not have an effect on the platelet response induced by ADP activation (*Fröhlich et al., 1998*).