



A COMPARATIVE STUDY BETWEEN TRUE TUMESCENT LOCAL ANESTHESIA TECHNIQUE AND OTHER CONVENTIONAL ANESTHETIC REGIMENS IN LIPOSUCTION

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وَأَنْزَلَ اللَّهُ عَلَيْكَ
الْكِتَابَ وَالْحِكْمَةَ
وَعَلَّمَكَ مَا لَمْ تَكُنْ
تَعْلَمُ وَكَانَ فَضْلُ
اللَّهِ عَلَيْكَ عَظِيمًا

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List of Contents

| Title | Page No. |
|-----------------------------------|------------|
| List of Tables | ii |
| List of Figures | iii |
| List of Abbreviations..... | iv |
| INTRODUCTION | 1 |
| AIM OF THE WORK | 4 |
| LOCAL ANESTHETICS..... | 5 |
| TUMESCENT ANESTHESIA..... | 43 |
| TUMESCENT LIPOSUCTION | 69 |
| PATIENTS AND METHODS..... | 101 |
| RESULTS..... | 109 |
| DISCUSSION | 135 |
| CONCLUSION..... | 157 |
| SUMMARY | 159 |
| REFERENCES..... | 163 |

List of Tables

| Table No. | Title | Page No. |
|--------------------|--|----------|
| Table (1): | Anesthetic duration and toxicity of local anesthetic isomers..... | 8 |
| Table (2): | Characteristics and Clinical correlation..... | 13 |
| Table (3): | Common Local Anesthetics Duration & Maximum Doses | 15 |
| Table (4): | Physiochemical properties of local anesthetics | 18 |
| Table (5): | Pharmacodynamic properties of local anesthetics | 18 |
| Table (6): | Recommendations for Diagnosing LAST | 35 |
| Table (7): | Goals of the Tumescant Technique)..... | 45 |
| Table (8): | Types of wetting solution | 46 |
| Table (9): | Actual applications of TA | 56 |
| Table (10): | Potential applications of TA..... | 57 |
| Table (11): | Common Tumescant Analgesia Fluid Formulas for 1000 mL of either 0.9% Saline or Lactated Ringer's Solution..... | 59 |
| Table (12): | Steps for minimizing pain on LA injection | 61 |
| Table (13): | Types of liposuction techniques | 73 |
| Table (14): | Comparison between liposuction under general anesthesia and tumescent anesthetic technique | 77 |
| Table (15): | Measures to prevent intraoperative hypothermia during liposuction | 93 |
| Table (16): | Comparison between the 3 groups as regard the demographic data (age, gender, weight, height, BMI) | 109 |
| Table (17): | Comparison between the 3 groups as regard the areas selected for liposuction | 110 |
| Table (18): | Comparison between the 3 groups as regard the preoperative Hb & Hct values | 111 |
| Table (19): | Comparison between the 3 groups as regard the preoperative HR, MAP, SpO ₂ and RR values. | 111 |
| Table (20): | Comparison between the 3 groups as regard the duration of anesthesia | 114 |
| Table (21): | Comparison between the 3 groups as regard the amount of fluids infiltrated & aspirated..... | 116 |

List of Tables (*Cont...*)

| Table No. | Title | Page No. |
|--------------------|--|----------|
| Table (22): | Comparison between the 3 groups as regard the intraoperative HR values | 117 |
| Table (23): | Comparison between the 3 groups as regard the intraoperative MAP values. | 119 |
| Table (24): | Comparison between the 3 groups as regard the intraoperative RR values..... | 121 |
| Table (25): | Comparison between the 3 groups as regard the intraoperative SpO ₂ values | 123 |
| Table (26): | Comparison between the 3 groups as regard the recovery time | 124 |
| Table (27): | Comparison between the 3 groups as regard postoperative nausea and/or vomiting | 125 |
| Table (28): | Comparison between the 3 groups as regard the preoperative Hb & Hct values. | 126 |
| Table (29): | Comparison between the 3 groups as regard the need for postoperative analgesia | 126 |
| Table (30): | Comparison between the 3 groups as regard the patient satisfaction. | 127 |
| Table (31): | Comparison between the 3 groups as regard the postoperative vital data. | 128 |
| Table (32): | Comparison between the 3 groups as regard the time to hospital discharge. | 133 |

List of Figures

| Fig. No. | Title | Page No. |
|---------------------|--|----------|
| Figure (1): | local anesthetic structure | 6 |
| Figure (2): | Local anesthetic action. | 10 |
| Figure (3): | Approximate serum concentrations and systemic influences of lidocaine | 35 |
| Figure (4): | Guidelines for management of Local anesthetic systemic toxicity | 42 |
| Figure (5): | Example of three-way stopcock system for the administration of tumescent anesthesia..... | 55 |
| Figure (6): | The process of liposuction | 69 |
| Figure (7): | The Tumescent technique | 90 |
| Figure (8): | Visual Analogue Pain Scale | 108 |
| Figure (9): | Comparison between the groups as regard the areas selected for doing liposuction | 110 |
| Figure (10): | Comparison between the groups as regard the preoperative HR values. | 112 |
| Figure (11): | Comparison between the groups as regard the preoperative MAP values. | 112 |
| Figure (12): | Comparison between the groups as regard the preoperative RR values.. | 113 |
| Figure (13): | Comparison between the groups as regard the preoperative SpO ₂ values..... | 113 |
| Figure (14): | Comparison between the groups as regard the Duration of anesthesia.. | 115 |
| Figure (15): | Comparison between the groups as regard the Duration of surgery. | 115 |
| Figure (16): | Comparison between the groups as regard the amount of fluids infiltrated or aspirated..... | 116 |
| Figure (17): | Comparison between the groups as regard the intraoperative HR values. | 118 |

List of Figures (*Cont...*)

| Fig. No. | Title | Page No. |
|---------------------|--|----------|
| Figure (18): | Comparison between the 3 groups as regard the intraoperative MAP values during the first 150 min of the operation..... | 120 |
| Figure (19): | RR measurement in the 3 groups during the first 150 min of the operation. | 122 |
| Figure (20): | SpO ₂ measurement in the 3 groups during the first 150 min of the operation. | 124 |
| Figure (21): | Comparison between the groups as regard the recovery time. | 125 |
| Figure (22): | Comparison between the groups as regard the patient satisfaction..... | 127 |
| Figure (23): | Comparison between the groups as regard the postoperative HR values..... | 129 |
| Figure (24): | Comparison between the groups as regard the postoperative MAP values. | 129 |
| Figure (25): | Comparison between the groups as regard the postoperative RR values..... | 130 |
| Figure (26): | Comparison between the groups as regard the postoperative SpO ₂ values. | 130 |
| Figure (27): | Heart rate measurements in the 3 groups during the pre, intra and postoperative periods. | 131 |
| Figure (28): | SpO ₂ measurements in the 3 groups during the pre, intra and postoperative periods. | 132 |
| Figure (29): | MAP measurements in the 3 groups during the pre, intra and postoperative periods. | 132 |
| Figure (30): | RR measurements in the 3 groups during the pre, intra and postoperative periods. | 133 |
| Figure (31): | Comparison between the groups as regard the time to hospital discharge..... | 134 |

list of Abbreviations

| | |
|---------------------------|---|
| AAGP: | Alpha1 acid glycoprotein |
| ARDS: | Acute Respiratory Distress Syndrome |
| ASA: | American Society of Anesthesiologist |
| BMI: | Body Mass Index |
| CBC: | Complete Blood Count |
| CNS: | Central Nervous System |
| CPR: | Cardiopulmonary Resuscitation |
| CV: | Cardiovascular |
| CYP: | Cytochrome P |
| DVT: | Deep Venous Thrombosis |
| ECG: | Electrocardiogram |
| EtCO₂: | End-Tidal Carbon Dioxide |
| Hb: | Hemoglobin |
| Hct: | Hematocrit |
| HIV: | Human Immune Deficiency Virus |
| HR: | Heart Rate |
| ILE: | Infusion of Lipid Emulsion |
| IQR: | Interquartile Range |
| IV: | Intravenous |
| IVRA: | Intravenous Regional Anesthesia |
| LA: | Local Anesthetic |
| LAST: | Local Anesthetic Systemic Toxicity |
| MAC: | Minimum Alveolar Concentration |
| MAC: | Monitored Anesthesia Care |
| MAP: | Mean Arterial Blood Pressure |
| Mcg, µg: | Microgram |
| MLAC: | Minimum Local Anesthetic Concentrations |
| NaCL: | Sodium Chloride (Saline) |
| NaHCO₃: | Sodium Bicarbonate |
| NIBP: | Non-Invasive Blood Pressure |
| NS: | Normal Saline |
| NSAIDs: | Non-Steroidal Anti-Inflammatory Drugs |

List of Abbreviations (*Cont...*)

| | |
|--------------|---------------------------------------|
| PABA: | Paraminobenzoic Acid |
| PACU: | Post-Anesthetic Care Unit |
| PONV: | Postoperative Nausea And Vomiting |
| PT: | Prothrombin Time |
| PTT: | Partial Thromboplastin Time |
| SD: | Standard Deviation |
| SpO2: | Oxygen Saturation |
| TL: | Tumescent Liposuction |
| TLA: | Tumescent Local Anesthesia |
| UGRA: | Ultrasound Guided Regional Anesthesia |
| VAS: | Visual Analogue Scale |
| WAL: | Water Assisted Liposuction |

INTRODUCTION

Liposuction is the most common cosmetic surgical procedure worldwide. The evolution of liposuction over the past decade has been driven by the desire to achieve better aesthetic outcome, provide safety and allow the procedure to be performed in an outpatient facility (*Stephan and Kenkel, 2010*).

Liposuction may be performed under general, regional or local anesthesia. The choice of anesthetic technique depends on both the site and extent of liposuction and also patient preference. Since these procedures are often performed as day care, it is important that there is fast recovery of psychomotor and cognitive functions ensuring early discharge of the patient (*Sood et al., 2011*).

Historically, liposuction was developed by surgeons who preferred general anesthesia over local anesthesia. As a consequence, the vast majority of liposuction surgeries are still performed with the use of general anesthesia. Other surgeons prefer regional spinal anesthesia due to its safety, low cost and fewer side effects compared to general anesthesia. In both techniques, they infiltrate only relative small amounts of solution with epinephrine to prevent considerable blood loss which is referred to as Semi-tumescent liposuction (*Regatieri and Masquera, 2006*).

However massive shifts of fluid out of the vascular space into the areas traumatized by the liposuction cannula in addition to blood loss have been the major risk factors in liposuction by these conventional anesthetic techniques (*Sood et al., 2011*).

Tumescent liposuction was first introduced in the mid 1980's. This technique eliminated most of the medical and cosmetic problems associated with liposuction that had been encountered with the conventional anesthetic techniques in the earlier years (*Habbema, 2009*).

The word tumescence means 'to swell'. In this technique, very large volumes (35-55mg/kg) of highly diluted (0.05% to 0.1%) lidocaine with epinephrine 1 mg/L (1:1,000,000) along with additives as sodium bicarbonate are injected into the subcutaneous tissue to expand the tissues, make them firm, swollen and turgid. This creates a plane where suction of fat becomes easier, with less volume of blood loss (*Sood et al., 2011*).

The use of Tumescent Local Anesthesia "TLA" as the exclusive method of anesthesia is known as True Tumescent anesthesia. It permits liposuction totally by local anesthesia without the need for general or spinal anesthesia, narcotic analgesia or deep sedation (*Klein, 2011*).

Several studies have demonstrated the advantages of TLA over other conventional anesthetic techniques in providing minimal blood loss, rapid postoperative recovery, prolonged local anesthesia, improved aesthetic results and decreased both surgical and anesthetic risks. However, strict adherence to basic guidelines and thorough knowledge of the pharmacological mechanism and of the anesthesiologic aspects of the technique are essential to prevent complications related to TLA (*Svedman et al., 2006*).

AIM OF THE WORK

The aim of this study is to evaluate and compare between conventional anesthetic methods (semi-tumescent anesthetic technique with either general anesthesia or spinal anesthesia) and True Tumescent Local anesthetic technique used for upper and lower abdominal liposuction procedure in order to know the ideal anesthetic technique providing less blood loss, longer postoperative analgesia, rapid postoperative recovery and less both surgical and anesthetic risks.

Chapter (1)

LOCAL ANESTHETICS

Local anesthetics (LAs) are defined as drugs that reversibly block transmission of a nerve impulse, without affecting consciousness. The medical use of local anesthetic agents began some years after isolating cocaine from Peruvian coca in the 1860s. However, due to cocaine's effect of euphoria, subsequent addiction, and cases of mortality from its clinical use, a drive was created to develop less toxic newer amino esters (*Ciechanowicz and Patil, 2012*).

Procaine synthesis in 1905 was to dominate LA use for the next 40 years, but due to the slow onset of action and allergic potential of amino esters, the hypoallergenic amino amides gradually forced its path with lidocaine appearing in 1948 which is still the most commonly used LA (*Ciechanowicz and Patil, 2012*).

The subsequent evolution of LAs use has made a wide expansion in our knowledge of these drugs and in techniques of their administration, although the agents themselves have changed comparatively less. Modern LAs are safer, but still risks persist. The cornerstone of safe practice with LAs is a thorough understanding of their pharmacological and toxicity profiles, in particular, dose and concentration required, speed of onset and duration of action. Clinicians administering