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

# Comparative Evaluation of the Efficacy of Treatment with Intravenous Lignocaine and Intravenous Granisetron in Prevention of Pain Due to Intravenous Injection of Propofol

Thesis

***Submitted For Partial Fulfillment of Master Degree in Anesthesiology***


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# List of Abbreviations

| Abb. | Full term |
|---|---|
| **ASA** | **American Society of Anesthesiologists** |
| **CNS** | **Central nervous system** |
| **ECG** | **Electrocardiography** |
| **GABA** | **γ-aminobutyric acid** |
| **i.v** | **Intravenous injection** |
| **ICU** | **Intensive care unit** |
| **IV** | **Intravenous** |
| **LA** | **Local anesthetic** |
| **NPO** | **Nulla per os** |
| **PD** | **Pharmacodynamic** |
| **PEG660 HS** | **Polyethylene glycol 660 hydroxystearate** |
| **PK** | **Pharmacokinetic** |
| **PONV** | **Postoperative nausea and vomiting** |
| **PRIS** | **Propofol Infusion Syndrome** |
| **PS** | **Physical status** |
| **SC** | **Subcutaneously** |
| **VAS** | **Visual analogue scale** |

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# INTRODUCTION

Propofol is one of the most widely used clinical intravenous anesthetics with the advantages of rapid onset, complete recovery, no accumulation, and good controllability. However, local injection pain is a common adverse reaction, with an incidence rate of 28% to 90% in adults and 28% to 85% in children. Propofol injection pain can cause obvious discomfort and distress to the patient, affecting blood pressure and heart rate.

The preventive effect of 5-HT3 receptor antagonists (such as ondansetron, granisetron, and tropisetron) on nausea and vomiting after surgery had been confirmed. Compared with other antiemetic drugs, 5-HT3 receptor antagonists have fewer side effects and no sedative and hypnotic effects ***(Wenjie Zhou, Jie Zhou, 2020).***

A number of both pharmacological and non-pharmacological methods have been used with variable results and the research for the ideal agent to decrease pain on propofol injection is still going on. Non pharmacological methods like injection in a fast running i.v. fluid, injection in a larger vein, diluting with 10% intra lipid, cooling propofol to 4°C have been tried with little success ***(Zhang et al., 2019).***

Several publications have shown that 5-$HT_3$ receptor antagonists can effectively prevent propofol injection pain

compared to the placebo. In order to provide more reliable evidence for the clinical application of 5-$HT_3$ receptor antagonists for reducing propofol injection pain, we performed this study with comparison to lignocaine effect.

With decreasing number of morbid adverse events after surgery, the emphasis has inclined towards patient comfort and perioperative management. Pain on injection of propofol remains a common problem and various methods have been tried to decrease this pain, including mixing lignocaine with propofol in the same syringe ***(Ahmed et al., 2012).***

It's reported that Granisetron is administered to prevent post-operative nausea and vomiting in patients following general anesthesia. Granisetron is a serotonin $5HT_3$ receptor antagonist and demonstrates superior efficacy and longer duration to lignocaine. We noted that intravenous granisetron might decrease pain on injection of propofol ***(Gupta and Jain, 2014).***

# AIM OF THE STUDY

Comparison of treatment with granisetron versus lignocaine with respect to improvement of pain induced by injection of propofol, in patient admitted for elective surgery under general anesthesia.

# REVIEW OF LITERATURE

## (1) Propofol:

Propofol (2,6-diisopropylphenol) is a potent intravenous hypnotic drug that was developed by Imperial Chemical Industries Limited (London, UK), patented by John (Iain) Glen and Roger James in 1977, and commercially launched in 1986 in Europe and 1989 in the US ***(Sahinovic et al., 2018).***

Like most anaesthetics, propofol is a γ-aminobutyric acid (GABA) receptor agonist. It has a favourable pharmacokinetic (PK) and pharmacodynamic (PD) profile, which has resulted in it becoming the most commonly used intravenous anaesthetic for the past three decades. Rapid and smooth induction with nearly no excitation phenomena, relatively short context-sensitive time, rapid terminal half-life time and low incidence of postoperative nausea and vomiting (PONV) make it a very versatile hypnotic drug. It is used for sedation and anaesthesia for almost all types of surgery, but is particularly well-suited for anaesthesia in patients undergoing ambulatory and neurosurgery where rapid psychomotor recovery are of upmost importance. The adverse effects of propofol are well-documented, with the most common being pain on injection ***(Sahinovic et al., 2018).***

Propofol is used for procedural sedation, during monitored anesthesia care, or as an induction agent for general

anesthesia. It may be administered as a bolus or an infusion or some combination of the two. The formula contains soybean oil, glycerol, egg lecithin, and a small amount of the preservative EDTA. Strict aseptic technique must be used when drawing up propofol as the emulsion can support microbial growth ***(Zhang et al., 2019).***

***(A) Nature of propofol:***

Propofol, a non opioid intravenous anaesthetic agent, is frequently used as an inducing agent today. The uniqueness of propofol lies in its rapid induction and clear, prompt and refreshing recovery. But such a widely used drug does have some demerits of its own which still remains a considerable concern for anaesthesiologists. Propofol causes pain and discomfort during intravenous injection (i.v.) for induction, in 28%-90% of the patients ***(Heim et al., 2019).***

Propofol, an alkyl phenol compound, is virtually insoluable in aqueous solution. Therefore, it is formulated as emulsion containing 1% (weight/vol) propofol, 10% soya bean oil, 2.25% glycerol and 1.2% purified egg phosphatid. The drug evokes pain on i.v. injection though its pH and osmolality are close to those of blood ***(Antkowiak and Rammes, 2019).***

***(B) Uses:***

Propofol is widely used for induction of anaesthesia, although the pain during its injection remains a concern for all