An-Najah National University
Faculty of Graduate Studies

EFFICACY OF PROPHYLACTIC ANTIEMETICS IN PATIENTS UNDERGOING LAPAROSCOPIC SURGERIES: A DESCRIPTIVE STUDY

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Dedication

This thesis is dedicated to Allah and His Messenger, Prophet Muhammad, who taught us the true meaning and purpose of life.

May my dear Palestine always be strong and free.

To the spirit of martyr Jawad Al-Rimawi, your sacrifice for our motherland will never be forgotten.

To my special parents, whose unconditional love, sacrifices, and unwavering support have influenced every success of mine, thank you for instilling in me persistence and integrity, as well as your continual prayers and encouragement during this road.

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Declaration

I, the undersigned, declare that I submitted the thesis entitled:

EFFICACY OF PROPHYLACTIC ANTIEMETICS IN PATIENTS UNDERGOING LAPAROSCOPIC SURGERIES: A DESCRIPTIVE STUDY

I declare that the work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

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Date: 31/08/2024

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Abstract

Background: Postoperative Nausea and Vomiting (PONV) are popular, inconvenient surgical complications, in particular under general anaesthesia; in addition, no functional pharmacologic antiemetics have been developed.

Aims: This study aimed to compare the efficacy of prophylactic intravenous metoclopramide (10 mg) administered prior to extubation with dexamethasone (8 mg) given at the induction of anaesthesia in preventing PONV within the first 24 hours following laparoscopic surgery. The study also sought to assess their influence on the necessity for rescue antiemetic medicine, postoperative pain incidence and severity, occurrence of side effects, and patient satisfaction throughout the recovery phase.

Methods: The study was conducted in a Northern West Bank hospital from October 2024 to April 2025, including 90 patients scheduled for elective laparoscopic surgery. The patients were divided into two groups: one group received 8 mg of intravenous dexamethasone at anaesthesia induction, and the other received 10 mg of metoclopramide before extubation. Nausea severity was measured using a Likert scale, and postoperative pain was assessed using a VAS. Outcomes were evaluated in the PACU and at 6, 12, and 24 hours post-surgery.

Results: The Metoclopramide group manifested significantly less favorable outcomes, with higher nausea intensity (1.82 vs. 1.07), more rescue antiemetic use (44.4% vs. 15.6%), and more side effects like headache (73.3% vs. 42.2%), fatigue (77.8% vs. 46.7%), blurred vision (33.3% vs. 8.9%), and tremor (35.6% vs. 0%) in the PACU. In the ward (0–24 hours), they also had high nausea incidence (84.4% vs. 60%), greater nausea intensity (1.78 vs. 1.16), and more blurred vision and tremor. However, the Dexamethasone group required a higher rescue of antiemetics later (at 6 hours: 17.8% vs.

0%; 6.7% vs. 33.3% from arrival to 24 hours). Pain scores at 2 and 4 hours were higher with Metoclopramide, and satisfaction scores were lower (2.78 vs. 2.96).

Conclusion: Dexamethasone is better than Metoclopramide in to forbid postoperative nausea and vomiting, reducing nausea severity, frequency of adverse effects, and improving patient satisfaction. It also minimize the necessity for rescue antiemetic medications in the PACU, confirming its preference for elective surgery patients.

Keywords: Postoperative' nausea and vomiting (PONV); dexamethasone; metoclopramide; laparoscopic surgery; rescue antiemetics; patient satisfaction.

Chapter One

Introduction and Theoretical Background

1.1 Introduction

Laparoscopic surgery, commonly referred to as minimally invasive surgery, has been a significant improvement to the overall field of surgery. This surgical technique involves the use of slightly larger entry points and is facilitated by the use of a camera and slender instruments to perform the operations (Lin et al., 2024; Zhai et al., 2024).

Postoperative nausea and vomiting (PONV) is one of the most frequent and complex early postoperative problems. They occur more frequently when general anesthesia is used during surgery. In other parts of the world, the incidence rate of PONV ranges from 20% to 30% across all patients undergoing any surgery (Wang et al., 2024; Gan et al., 2007).

PONV has negative effects on patients, including discomfort, hospital stays, healthcare costs, and potential complications like wound dehiscence, dehydration, and electrolyte imbalances that require significant management (Qian et al., 2022).

PONV is complex and still under investigation. However, it appears that both the Central Nervous System (CNS) and the Gastrointestinal (GI) tract play substantial roles. Neurotransmitters cited as crucial in the genesis of PONV are 5-Hydroxytryptamine (Serotonin) Type 3 (5-HT3), dopamine D2 receptor (D2), histamine H1 receptor (H1), and muscarinic cholinergic receptors (M1). Anesthesia, surgical stress, and postoperative pain can trigger the Chemoreceptor Trigger Zone (CTZ) in the CNS and Vomiting Center (VC); hence, nausea and vomiting occur (Horn et al., 2014).

Laparoscopic surgeries increase the predisposing factors for PONV due to the presence of pneumoperitoneum, and specific operative positions that result in hemodynamic and vestibular disturbances (Apfel et al., 2013; Gan et al., 2014). Therefore, the management of postoperative nausea and vomiting includes pharmacological and non-pharmacological treatments. Pharmacological management mainly focuses on the use of antiemetics that act at different sites within the vomiting reflex arc, such as metoclopramide, a central and peripheral antiemetic that blocks dopamine and serotonin receptors in the brain, reducing nausea and vomiting, especially in cases that occur after surgery and chemotherapy, while also improving gastric motility (Weibel et al., 2020; Eliasen et al., 2020; De Oliveira Jr

et al., 2013). Corticosteroids, such as dexamethasone, have anti-inflammatory and central antiemetic properties, making them beneficial in reducing postoperative nausea and vomiting. Prophylactic antiemetics, such as 10 mg of metoclopramide or 8 mg of dexamethasone, are often used in hospitals where this study is conducted (De Oliveira Jr et al., 2013).

Based on the short review above, this study aims to compare the efficacy of prophylactic intravenous metoclopramide (10 mg) administered prior to extubation with dexamethasone (8 mg) given at the induction of anaesthesia in preventing PONV within the first 24 hours following laparoscopic surgery. The study also sought to assess their influence on the necessity for rescue antiemetic medicine, postoperative pain incidence and severity, occurrence of side effects, and patient satisfaction throughout the recovery phase.

1.2 Problem Statement

Laparoscopy has become the preferred surgical approach across the world due to the minimally invasive approach, faster recovery. However, postoperative nausea and vomiting (PONV) continue to be a common postoperative complication. The global incidence of PONV is in the range of 30–80%, depending on risk factors, surgical intervention and anesthesia technique. In 2024, a prospective study in pediatric patients showed that BIS-guided anesthesia significantly reduced post-operative nausea/vomiting rates at 24 hours, nausea decreased from 53% to 17% and vomiting decreased from 34% to 16%, showing how some intraoperative strategies can have an objective effect. (Frelich et al., 2024). In addition, a 2025 retrospective cohort of 3,772 pediatric surgeries also stated that overall PONV rates were relatively low (1.0% early, 3.8% delayed), however non-compliance with consensus guidelines nearly doubled the risk of PONV, confirming the importance of adherence to prevention protocols (Portnoy et al., 2025).

The impact of PONV is equally noteworthy in Palestine. A prospective multicenter study in 2021 reported a 45.5% overall incidence, with 43.1% experiencing nausea and 17.5% vomiting within 24 hours of surgery. Predictors of PONV included a history of postoperative nausea and vomiting and pain levels, suggesting that better risk assessment and pain control could reduce occurrence rates. This rate matches global data and indicates the lack of specific Palestinian surgical protocols for PONV prevention,

particularly for high-risk patients such as women undergoing bariatric or laparoscopic surgeries (R. M. Elsaid et al., 2021).

A recent study on gynecologic laparoscopy demonstrates why more research is needed on risk-based prediction models. This study successfully identified key predictors (BMI ≥24), higher Apfel score, preoperative anxiety, higher serotonin and prostaglandin E2 levels, and lower albumin to fibrinogen ratio) and developed a prediction tool with strong predictive value (AUC=0.898). This shows that despite having effective anti-nausea medications (such as dexamethasone, 5-HT3 antagonists, and NK-1 antagonists), the main challenge remains identifying patient risk and consistently applying multimodal prevention strategies (Zhu et al., 2025).

1.3 Significance of the Study

The researcher evaluates the outcomes of interventions and indicates the prevalence of PONV within the first 24 hours after surgery. Improving practices and preventing adverse events is vital to enhancing the patient experience in institutions that perform laparoscopic surgeries (Wang et al., 2015).

Effective PONV management can lead to:

Improved Patient Comfort and Satisfaction: Reducing PONV enhances patients' quality of care and satisfaction with surgical outcomes (Duarte, 2024).

Reduced Healthcare Costs: Effective and timely PONV control results in fewer days of admission, a reduced need for other therapies, and thus lower healthcare costs (Jin et al., 2020).

Enhanced Recovery and Outcomes: Reducing the incidence of PONV can help with early ambulation with such benefits as early return to normal activities by the patient, Patients' perception of well-being, decreased adverse effects such as dehydration, alteration in electrolyte balance, and aspiration pneumonia (Ma et al., 2022; Gan et al., 2020).

The scope of this study will contribute to the collection of this literature by evaluating the efficacy and safety of Metoclopramide and dexamethasone for the prevention of PONV in patients who underwent laparoscopic surgeries. The study contributes to the

development of guidelines that clinicians provide to patients, thereby enhancing the quality of care for surgical procedures (Gan et al., 2020; Karanicolas et al., 2008).

1.4 Theoretical Background

1.4.1 Concepts and Operational Definitions

Search Strategy

To formulate the theoretical concept, a systematic literature search was conducted in PubMed, Cochrane Library, Science Direct, and Google Scholar. The terms PONV, dexamethasone, metoclopramide, laparoscopic surgery and antiemetic effectiveness were used.

Filters used were articles published between 2014 and 2025, in the English language, and restricted to RCTs, systematic reviews, and meta-analyses. Studies were selected with a population of adult patients who received laparoscopic surgery because these are reflective of the target population of this study. In addition to this, the current research harness a non-probability purposive sampling method to include adult patients who met the inclusion criteria so that participants would be representative of the clinical situation being studied.

This three-pronged strategy provided a powerful evidence rule for information of theoretical framework development and study design.

Building from the literature reviewed and the search strategy adopted, it is necessary to obvious define the necessary concepts within this study to create a common understanding. Defining the concepts work for a basis for interpretation of findings within a uniform framework and give clarity in the use of terms during the research. Thus, the following section offers the conceptual definitions fundamental to this research.

Postoperative nausea and vomiting (PONV) are well-known side effects of the general anesthesia experienced by patients. They usually appear within a day of surgery (Reem M Elsaid et al., 2021; Khanna et al., 2022).

Nausea is a vicious feeling in the throat that can be articulated as the desire to vomit without actual contraction of the muscles of the stomach. It is measured quantitatively in

terms of the patients' perception of this discomfort on a Likert scale of 0-6 (Xu et al., 2024; Apfel et al., 2012).

Vomiting, on the other hand, is the process of moving the mouth that involves the expulsion of the content of the stomach, which is brought about by the opening of the cardiac sphincter and the contraction of the abdominal and diaphragmatic muscles. The number and severity of vomiting episodes are assessed using the patient's self-reports and the clinician's observations during specific, defined postoperative time points (Apfel et al., 2002; Gan et al., 2014).

Retching refers to the act of vomiting involving contractile muscular function of the respiratory muscles, such as the diaphragm and abdominal wall muscles, without the expulsion of vomit. Despite the lack of a truly vomiting action, retching essentially causes as much stress or discomfort to patients as vomiting does, especially in cases where the retching is caused by an empty stomach (White & Kehlet, 2010; Apfel et al., 2002).

Laparoscopic surgery, a technique that involves making small openings in the abdomen using a pneumatically connected camera, fibre-optic instruments, and other slender tools to operate, is intended to shorten the treatment period and decrease the risk of postoperative complications (Tichansky et al., 2012).

1.4.2 Laparoscopic Surgery

Laparoscopy is a surgical procedure in which small incisions, ranging from 0.5 cm to 1.5 cm, are made using specialised instruments. This enables surgeons to perform specialised operations on patients with high-risk cases with reduced pain and higher rates of healing. Laparoscopic surgery is less invasive, and patients are often discharged within the first 24 hours. Recovery times are also decreased since there is minimal tissue damage compared to open surgeries, resulting in a shorter recovery period. Organs have a faster healing time than open surgeries; hence, patients spend less time in the hospital and have fewer visible scars. Classical invasive surgical procedures involve great incisions that lead to high pain and a long time to recover. Laparoscopic procedures are performed with small incisions on the skin, as compared to the large incisions used in other surgeries, thereby reducing the risk of infections and other complications. These are some of the reasons why reducing the visibility of scars enhances patient satisfaction. Laparoscopic surgery has been widely adopted in nearly all medical fields due to its better results,

minimal discomfort, and early mobilisation. It has been known to be effective in handling many surgeries owing to its features (Zhai et al., 2024; López et al., 2019).

Mechanisms Contributing to PONV

General Anesthesia: PONV has been associated with general anaesthesia through several mechanisms. In general anesthesia, drugs that predominantly affect the GI tract by decreasing peristalsis and gut tone can cause nausea and discomfort. Additionally, these agents may directly act on the vomiting centre in the brain stem, thereby increasing the likelihood of developing PONV. The option of anaesthetic regime, especially the use of volatile agents such as isoflurane or desflurane, raises the probability of PONV. Healthcare workers can control it. They can limit patients' exposure to drugs that cause nausea and vomiting (Gan et al., 2020; Apfel et al., 2012).

Carbon Dioxide (CO2) Insufflation: During laparoscopic surgery, the establishment of the pneumoperitoneum, when used for visualisation and to create working space, is associated with a rise in PCO2 levels and intra-abdominal pressure, both of which are known to cause PONV. This pressure may act on the vagus nerve and diaphragm, and change the respiratory motion that is likely to elicit the vomiting reflex. Therefore, it is essential to manage pneumoperitoneum to avoid the consequences mentioned earlier (Jiang et al., 2019; Apfel et al., 2012).

Surgical Procedure: Patients at high risk for PONV are identified by the type and length of surgery, and when there is direct involvement of the abdomen or prolonged surgery requiring anesthesia. Other causes of PONV require patient positioning in the Trendelenburg or reverse Trendelenburg position because they interfere with antiemetic neural pathways that control vomiting reflexes (Gan et al., 2020).

Medications: Evidently, opioids and antibiotics administered preoperatively are some of the significant predictors of PONV. Opioids decrease peristalsis in the GI tract and have CNS action on the CTZ in the brain, and antibiotics alter the normal flora of the gastrointestinal tract, which may, in turn, worsen nausea. These effects can be minimised by low opioid management, the use of non-opioids, such as Non-Steroidal Anti-Inflammatory Drug (NSAIDs), in handling pain, and a low nausea selection of antibiotics. Metoclopramide, Ondansetron, and dexamethasone are additional medications to control

PONV, with the importance of individualised PONV prevention according to the patient characteristics (Stoops & Kovac, 2020; Thanuja et al., 2021; Gan et al., 2014).

Fluid Management: Closely related to the issue of PONV is the matter of fluid balance in the case of laparoscopic surgery. Several preventive measures should be taken to reduce PONV, such as monitoring the patient's input and output during and after surgical operations. This condition indicates low blood pressure. Consequently, low blood volume can lead to electrolyte imbalances. In this case, this may limit sustained intravascular volume and organ function, while also improving postoperative recovery, which is of paramount importance. These include ensuring patients are well-hydrated prior to surgery. They also need to provide patients with adequate replacement during surgery and stabilize them postoperatively. It is advisable not to take anything containing any form of coloring for up to two hours before the operation. Cohesive and integrated measures of perioperative fluid management are in harmony when the objective is to reduce PONV in patients who have undergone laparoscopic surgery. This helps prevent dehydration, rebalances electrolyte levels in the body, and achieves hemodynamic stability to minimise complications arising from surgery and anaesthesia. These measures also boost treatment, patients' outcomes, and postoperative experience (Gan et al., 2020).

Postoperative Care: There is strong evidence that measures such as pain control, early mobilisation, and a gradual return to a normal diet all help prevent PONV. Good analgesia decreases stress and anxiety, and motion promotes GI, circulation, and lung recovery in patients (Gan et al., 2020).

1.4.3 Pathophysiological Mechanisms of PONV in Laparoscopic Surgery

Neurophysiological Basis of PONV

That through the CNS via the CTZ, the vomiting centre in the brainstem, and the vagus nerve are considered to be major areas involved in eliciting an emetic response. The CTZ in the area postrema of the medulla detects circulating toxins, thereby activating the VC to expel them (Hollis et al., 2021). The sensitive vagus nerve is also involved in the transfer of the sensation from the GI tract to the CNS to a greater extent in the generation of the emetic reflex (Wang, Sun, and Chen, 2022). Recent advances in imaging and neuropharmacology have revealed that these neurotransmitter receptors, including

serotonin and dopamine, are responsible for this response (Qiu et al., 2024; (Rajan & Joshi, 2021).

Surgical Manipulation: While performing laparoscopic surgery, it is also important to note that one can inadvertently rub the fascial tissues in the abdominal cavity, potentially triggering action in the vagus nerve. Finally, regarding gastrointestinal sensations, the vagus nerves are involved in conveying the signal or message of nausea and vomiting to the brain. When triggered, it activates the VC, a part of the brain that creates nausea and, consequently, vomiting sensations (Gan et al., 2020).

Neurotransmitter Involvement

Serotonin (5-HT3): Serotonin is the main neurotransmitter involved in gastrointestinal function and vomiting. During laparoscopic procedures, serotonin levels increase in the gastrointestinal tract and the brain's CTZ. Higher brain serotonin levels activate 5-HT3 receptors, leading to nausea and vomiting (Gan et al., 2020).

Substance P: This neurotransmitter is related to the vomiting reflex. It belongs to a class of neuropeptides known as neurkinins, which are released in response to tissue damage and inflammation. When substance P is released, it binds to neurokinin-1 (NK1) receptors in the brain and gastrointestinal system. This binding increases sensitivity to nausea triggers, contributing to PONV severity (Gan et al., 2020).

Respiratory Changes: Pneumoperitoneum alters breathing by restricting diaphragm movement and decreasing lung compliance. These changes can lead to low oxygen and high CO2 levels, which activate the CTZ and increase the risk of vomiting.

Circulatory Effects: CO2 insufflation affects circulation by increasing venous return and changing cardiac output. These hemodynamic changes may impact nausea pathways and contribute to PONV (Venkatraman et al., 2023).

Clinical Challenges and Risk Factors in PONV

Patient Characteristics

Age: Patients over 50 years and children under 5 are more susceptible to PONV due to differences in metabolic rates and tolerance to medication side effects (Apfel et al., 1999). Young children have immature enzyme systems that affect how quickly medications are

cleared from the body. However, adult patients may show altered drug processing and response characteristics.

Gender: Studies show that female patients experience PONV more than male patients. This difference between the two genders is due to the effects of estrogen and progesterone that control nausea and vomiting (Apfel et al., 1999).

Medical history affects PONV risk: Patients with a history of motion sickness or previous PONV episodes are more likely to experience PONV. Additionally, diabetes and gastrointestinal disorders increase the incidence of PONV due to changes in gastric motility and metabolism (Apfel et al., 2012).

Anesthetic Choices

Inhalational agents like isoflurane and desflurane are more likely to cause nausea and vomiting than intravenous anesthetics, especially propofol. These substances can affect both the vestibular system and CTZ, which increases the risk of PONV (Apfel et al., 2012).

Management Strategies

Antiemetic Therapies: While currently available antiemetic treatments are very effective, they can have negative effects and low efficacy in some situations. Combination therapy is recommended because it is more effective, as most antiemetic medications only affect one or two of these pathways (Gan et al., 2020; Weibel et al., 2020).

Personalised Health Care: Trends for improving treatment regimens tailored to the patient's profile include the use of pharmacogenomics-based therapy techniques and the application of principles for the development of personalised medicine. For example, it has been demonstrated that genetic variations influence an individual's response to antiemetic medications in genes related to the serotonin receptor and metabolism (Elvir-Lazo et al., 2020; (López-Morales et al., 2018).

1.4.4 Mechanisms of Action: Metoclopramide alone versus dexamethasone alone

Metoclopramide

Metoclopramide is a prokinetic and antiemetic drug that works via both peripheral and central mechanisms. At the central level, it inhibits the vomiting reflex by acting as a dopamine D2 receptor antagonist in the CTZ of the medulla oblongata. This is useful when nausea is brought on by medications, poisons, or metabolic disorders (Holte & Kehlet, 2002). It improves stomach emptying and GI motility coordination by stimulating 5-hydroxytryptamine receptor 4 (5-HT4) receptors and counteracting the inhibitory effect of dopamine on gastrointestinal smooth muscle. This is advantageous in cases of gastroparesis and gastroesophageal reflux disease (GERD).

Metoclopramide's moderate inhibition of 5-HT3 receptors at higher doses increases its effectiveness in treating chemotherapy-induced nausea and vomiting (CINV) (Gershon, 2013). It also improves peristalsis by modulating stomach contractions to promote gastric emptying (Kamel, 2015) and increases lower oesophageal sphincter tone. They can also reduce reflux-associated nausea (De Oliveira Jr et al., 2012). Because of this, metoclopramide is a commonly used and accessible medication in clinical settings to reduce PONV (Ayele et al., 2022).

Dexamethasone: Dexamethasone is a potent corticosteroid effective against all types of PONV. It reduces surgery-related inflammation and maintains vagus nerve activation after surgery, minimising nausea and vomiting (Najafzadeh et al., 2023; McBurney, 2020). Due to its effects on serotonin receptors and other nausea pathways, dexamethasone is often combined with other anti-nausea medications in PONV prevention protocols (Najafzadeh et al., 2023). The drug is well tolerated and can be used with other medications, but may cause fluid retention, fatigue, and immune suppression in diabetic patients. Despite these side effects, dexamethasone improves patient comfort by reducing nausea and vomiting after laparoscopic surgeries.

1.4.5 Previous studies have confirmed the clinical significance of PONV, especially in patients undergoing laparoscopic procedures

Building on these results, this study examines both drug-related and patient-related factors that affect PONV occurrence and severity. Evidence shows that treatments like dexamethasone and metoclopramide work differently depending on timing, dosage, and

individual patient risk factors, all of which are important when developing effective prevention strategies. For example, a double-blind, placebo-controlled study (Rasheed et al., 2019) aimed to evaluate the efficacy of preoperative dexamethasone in ameliorating postoperative symptoms after laparoscopic cholecystectomy. Among the 80 patients who received either intravenous dexamethasone (8 mg) or placebo, no obvious side effects were reported. Seven patients 18% in the dexamethasone group had nausea compared to 16, 40% in the placebo group ($p = 0.026$). Similarly, only one patient 3% in the dexamethasone group reported vomiting compared to seven 18% in the placebo group ($p = 0.025$). Dexamethasone also significantly reduced the postoperative VAS pain score ($p = 0.030$) and VAS fatigue score ($p = 0.023$). Additionally, fewer patients in the dexamethasone group required diclofenac sodium 50 mg (0.9 +/- 1.3) compared to the placebo group (2.2 +/- 2.5, $p = 0.002$).

Feo et al. (2006) conducted a randomised controlled trial to investigate the effect of preoperative dexamethasone on nausea and vomiting after laparoscopic cholecystectomy. A total of 101 patients undergoing laparoscopic cholecystectomy were randomised to receive either 8 mg of dexamethasone ($n = 49$) or placebo ($n = 52$) intravenously before surgery. No apparent drug side effects were noted. Seven patients 14% in the treatment group reported nausea and vomiting compared with 24 patients 46% in the control group ($P = 0.001$). Furthermore, only five patients 10% in the dexamethasone group required antiemetics compared to 23 patients 44% in the placebo group ($P < 0.001$). No significant difference in postoperative pain scores and analgesic requirements was detected between the groups.

Rüsch et al. (2002) studied the antiemetic effectiveness of metoclopramide and droperidol in 120 patients undergoing elective gynecological laparoscopy under general anesthesia with isoflurane. Metoclopramide showed unclear preventive effects, while droperidol showed reliable antiemetic effectiveness. Since neither drug alone provided adequate PONV prevention in high-risk patients, the study suggested that combining many antiemetics may offer a safer and more effective approach.

Egerton-Warburton et al. (2014) found that 4 mg intravenous ondansetron and 20 mg intravenous metoclopramide were comparable to placebo in reducing nausea severity. Although not statistically significant, the antiemetic groups showed trends toward greater

reductions in VAS scores and a lower need for rescue medication. Most patients in all groups were satisfied with their care.

An early work completed by Oksuz et al. (2007) evaluated the safety and efficacy of 20 mg intranasal metoclopramide for preventing nausea and vomiting in patients undergoing laparoscopic surgery. Based on 109 participants, results found that intranasal metoclopramide may not be effective for preventing PONV. The study concluded that perioperative or patient factors could not explain the poor performance of intranasal metoclopramide. Instead, low dosage or delayed drug absorption may explain the poor outcomes, although the small sample size may also have influenced the results.

Llanes-Garza et al. (2015) conducted a longitudinal, exploratory, double-blind, comparative, prospective, experimental investigation involving 30 patients scheduled for laparoscopic cholecystectomy. The postoperative risk was evaluated using the Apfel score. Two groups, each of fifteen patients, were formed from the patients. After anesthesia was induced, Group B received 4 mg of ondansetron alone, while Group A received 10 mg of metoclopramide and 4 mg of ondansetron. Using a Likert scale, nausea and vomiting were assessed 24 hours after surgery. The findings showed that a small percentage of individuals experienced minor nausea. In neither group did rescue medications become necessary, and the patient who vomited only once. The incidence of postoperative nausea and vomiting did not correlate with the Apfel score. As a conclusion, there was no statistically significant difference in the prevention of postoperative nausea and vomiting between ondansetron alone and ondansetron with metoclopramide in patients undergoing laparoscopic cholecystectomy.

Entezariasl et al. (2010) evaluated the incidence of nausea and vomiting after intravenous anaesthesia-based cataract surgery in 100 patients through a double-blind clinical experiment. Metoclopramide (10 mg), dexamethasone (8 mg), a pre-induction placebo (saline), or a combination of both medications was given to the patients at random. In the recovery room, the rate of nausea was 8% with the combination medication, 20% with metoclopramide, 16% with dexamethasone, and 44% with placebo. Vomiting occurred in 20% of cases when the combo was used, 4% when metoclopramide was used, 4% when dexamethasone was used, and 0% when the placebo was used. Metoclopramide and dexamethasone together greatly decreased nausea and vomiting in the recovery area and

in the first 24 hours after surgery; therefore, it is advised for high-risk patients, especially those undergoing outpatient procedures.

A case-control study was carried out by Hasan et al. (2024) on 79 patients who were scheduled for laparoscopic cholecystectomy under general anaesthesia at Duhok hospitals and had high postoperative nausea and vomiting (PONV) risk scores. Thirty-nine patients in the control group received normal saline (2 ml), while 40 patients in the study group received an intravenous pretreatment of metoclopramide (8 mg, 2 ml). Patients were called 48 hours later to determine the frequency and severity of PONV. The frequency of PONV did not differ significantly between the two groups ($p = 0.91$). The mean PONV risk score 2.48 and PONV incidence 2.8% showed a significant correlation ($p < 0.01$, 95% CI: 2.13-18.32). Metoclopramide alone is not effective for preventing PONV in high-risk patients. However, the PONV risk score effectively predicts the incidence of PONV.

Salahu & Datti (2020) compared metoclopramide and ondansetron for reducing PONV intensity after gynecological laparoscopic surgeries. They randomly assigned 66 patients, aged 18-55, scheduled for day-case gynecological laparoscopic surgery, to two groups. The first group received 4 mg intravenous ondansetron before anesthesia, while the second group received 10 mg intravenous metoclopramide. Researchers evaluated the intensity of nausea and vomiting during a 4-hour observation period preceding hospital discharge. Results showed that 24.2% of metoclopramide patients experienced mild nausea compared to 6.1% of ondansetron patients. Both groups had similar rates of severe nausea 9.1%. For vomiting, 6.1% of the metoclopramide group had one episode compared to 3% of the ondansetron group. No ondansetron patients had multiple vomiting episodes, while 3% of metoclopramide patients had two episodes. The study concluded that both drugs prevent moderate nausea equally well, but ondansetron is more effective at preventing vomiting.

Garg et al. (2023) compared the timing of dexamethasone and ondansetron administration for managing PONV in patients undergoing laparoscopic cholecystectomy. They conducted a randomized controlled trial with 200 patients of both sexes, aged 20-60, after receiving institutional ethics committee approval. After obtaining informed consent, patients were randomized into four groups: Group A received 8 mg dexamethasone 45

minutes before induction, Group B received 4 mg ondansetron 45 minutes before induction, Group C received 8 mg dexamethasone immediately before induction, and Group D received 4 mg ondansetron immediately before induction. Researchers monitored patients for nausea and vomiting episodes for 24 hours after surgery. Patient satisfaction with PONV management was measured using a 10-point verbal rating scale, where 0 meant "not satisfied" and 10 meant "fully satisfied." Groups B: 68% and D: (50%) had significantly higher rates of nausea and vomiting compared to Groups A (28%) and C: 36% ($p = 0.003$). Ondansetron administered 45 minutes before induction resulted in higher PONV scores than dexamethasone administered at the same time. Ondansetron also had significantly higher PONV scores than dexamethasone over 24 hours. The study concluded that dexamethasone is more effective than ondansetron. For ondansetron, timing matters as it worked better when given immediately before induction rather than 45 minutes earlier.

Ahmad et al. (2023) compared metoclopramide alone versus the combination of metoclopramide and dexamethasone for preventing PONV after laparoscopic cholecystectomy. The study included 150 patients with symptomatic gallstones scheduled for elective laparoscopic cholecystectomy using consecutive sampling. Patients were randomly divided into two groups: Group M received metoclopramide alone, while Group D+M received both intravenous dexamethasone and metoclopramide before anaesthesia induction. Researchers recorded nausea incidence, vomiting episodes, rescue antiemetic use, and hospital stay length over 24 hours. In Group D+M, 6 out of 75 patients 8% experienced nausea, and five patients 5.33% had vomiting. In Group M, 12 out of 75 patients 16% had nausea, and 14 patients 18.7% had vomiting. The difference was statistically significant ($p = 0.002$). Additionally, only three patients 4% in Group D+M needed extended hospital stays (>24 hours) compared to 10 patients 13.33% in Group M. The study concluded that combining metoclopramide with dexamethasone is more effective than metoclopramide alone for preventing PONV in laparoscopic cholecystectomy patients.

Tobi et al. (2014) studied whether combining dexamethasone and metoclopramide (DM) would prevent early and late PONV in women undergoing myomectomy under spinal anesthesia. After obtaining informed consent and hospital ethics committee approval, they randomized 90 patients aged 21-64 into three groups using computer-generated

random numbers in sealed envelopes: the dexamethasone-only group (DO) received 8 mg intravenous dexamethasone, the metoclopramide-only group (MO) received 10 mg intravenous metoclopramide, and the DM group received both drugs (8 mg dexamethasone and 10 mg metoclopramide intravenously). All medications were given immediately after spinal anaesthesia induction.The primary outcome was early PONV incidence (within 24 hours) and late PONV incidence (beyond 24 hours). The DO group had a 40% incidence of early PONV but no late PONV ($p = 0.003$). The MO group had 29.97% early PONV and 26.6% late PONV. The DM group showed a lower incidence of both early and late PONV compared to either single-drug group. The authors concluded that dexamethasone effectively reduces late PONV but has no effect on early PONV. The combination of dexamethasone and metoclopramide was more effective than metoclopramide alone for preventing both early and late PONV.

Wilson et al. (2001) conducted a study to examine the effectiveness of metoclopramide, ondansetron, and placebo in reducing PONV in patients undergoing outpatient laparoscopic cholecystectomy. They randomised 232 patients aged 18-73 to receive either a placebo, 4 mg ondansetron, or 10 mg metoclopramide intravenously before surgery. Results showed no significant differences in nausea incidence between the metoclopramide group 32%, the ondansetron group (45%), and the placebo group 44%. For vomiting, the incidence rates were 8% in patients treated with metoclopramide, 4% in patients treated with ondansetron, and 22% in the placebo group. While metoclopramide and ondansetron showed no significant difference in vomiting rates, both were significantly better than the placebo. The researchers concluded that both metoclopramide and ondansetron effectively reduce postoperative vomiting compared to placebo in laparoscopic cholecystectomy patients. Metoclopramide was identified as the more cost-effective option.

Rehman et al. (2023) evaluated the efficacy of intravenous dexamethasone compared to a control group for preventing PONV in patients undergoing laparoscopic cholecystectomy. The study included 120 laparoscopic cholecystectomy patients of both genders aged 18-60 years. Within 24 hours after surgery, Group A (dexamethasone) had a VAS score of 0.57 ± 1.42 compared to Group B (control) with 1.67 ± 2.10 ($p = 0.001$). For PONV-free rates up to 24 hours, 81.7% of patients treated with dexamethasone

experienced no PONV, compared to 56.7% of control patients, indicating that the treatment was effective ($p = 0.003$).

1.5 Aims of the Study

This study aims to compare the efficacy of prophylactic intravenous metoclopramide (10 mg) administered prior to extubation with dexamethasone (8 mg) given at the induction of anaesthesia in preventing PONV within the first 24 hours following laparoscopic surgery. The study also sought to assess their influence on the necessity for rescue antiemetic medicine, postoperative pain incidence and severity, occurrence of side effects, and patient satisfaction throughout the recovery phase.

Secondary aims:

- To compare the percentage of patients who received dexamethasone and metoclopramide in terms of the necessity for rescue antiemetic medication.
- To determine how prophylactic antiemetic drugs affect patient satisfaction throughout the recovery phase after surgery.
- Examine and record the side effect profile for each study drug.
- To assess postoperative pain, including its severity and correlation with the administration of various preventive antiemetic medications.

1.6 Hypotheses

H0: There is no statistically significant difference at ($p < 0.05$) exists in the intensity of nausea between patients administered Pramin (Metoclopramide) and those administered Dexamethasone post-laparoscopic surgery.

H0: There is no statistically significant difference at ($p < 0.05$) exists in the incidence of nausea between patients administered Pramin (Metoclopramide) and those receiving Dexamethasone post-laparoscopic surgery.

H0: There is no statistically significant difference at ($p < 0.05$) exists in the frequency of vomiting between patients receiving Pramin (Metoclopramide) and those receiving Dexamethasone during laparoscopic surgery.

H0: There is no statistically significant difference at ($p < 0.05$) exists in the necessity for rescue antiemetic medication between patients administered Pramin (Metoclopramide) and those given Dexamethasone post-laparoscopic surgery.

H0: There is no statistically significant difference at ($p < 0.05$) exists in patient satisfaction between individuals treated with Pramin (Metoclopramide) and those treated with Dexamethasone.

There is no statistically significant difference at ($p < 0.05$) exists in postoperative pain scores between patients administered Pramin (Metoclopramide) and those administered Dexamethasone after laparoscopic surgery.

There is no statistically significant difference at ($p < 0.05$) exists in the incidence of side events (pain, dizziness, headache, fatigue, tremor, and blurred vision between individuals administered Pramin (Metoclopramide) alone and those administered Dexamethasone alone.

Primary Outcomes

- The primary outcomes of the study are the incidence and intensity of postoperative nausea, together with the rate of vomiting, evaluated during the postoperative phase:
- Incidence of Nausea: Defined as the percentage of patients experiencing any level of nausea (score ≥1) subsequent to laparoscopic surgery.
- Severity of Nausea: Evaluated with a validated 7-point Likert scale from 0 to 6:

0 = Absence of nausea, 1 = Minimal nausea, 2 = Mild queasiness, 3 = Moderate queasiness, 4 = Intense nausea, 5 = Extremely severe nausea, 6 = Unbearable nausea

A nausea score of ≥3 is deemed clinically serious and signifies the necessity for rescue antiemetic treatments.

Vomiting Frequency: The quantity of vomiting episodes will be recorded. Two or more episodes are deemed clinically significant and will prompt the use of rescue antiemetic medicine.

Secondary Outcomes

- Postoperative pain will be evaluated using the Visual Analog Scale (VAS), which ranges from 0 to 10, where 0 indicates no pain and 10 indicates excruciating pain.
- A VAS value of 4 or above will be deemed clinically serious, necessitating the use of rescue analgesics.
- Adverse Effects: Surveillance and reporting of adverse effects frequently linked to metoclopramide and dexamethasone, such as dizziness, headache, fatigue, tremor, and blurred vision.

Chapter Two

Methodology

2.1 Materials and Methods

2.1.1 Study Design

The researcher used a cross-sectional design with a non-probability purposive sampling method to achieve the aims of the study to assess the effectiveness of metoclopramide compared to dexamethasone in preventing postoperative nausea and vomiting because it enables the assessment of outcomes at a particular point in time, that is, the immediate post-operative period. Without long-term tracking, it facilitates the speedy and convenient evaluation of two groups. It is appropriate in detecting correlations between the antiemetic medication given and the incidence of PONV, though it cannot prove causation. The design was considered the best option due to the ease of gathering clinical post-operative data and the minimal time the procedure would require.

2.1.2 Setting

This study was conducted in a hospital's Surgical and Anesthesia Department located in the Northern West Bank. Collecting data and conducting observations spanned an extended seven months, covering October 2024 to April 2025. This duration enabled the inclusion of a broad and representative sample of all patients undergoing surgical procedures during those months. Furthermore, the hospital's setting granted us access to our specific target, making sure that the patient population available for the study was well diversified.

2.1.3 Participants

Our study included 90 adult patients scheduled for elective laparoscopic surgery under general anaesthesia in a hospital in the northern west bank between October 2024 and April 2025. All patients were divided randomly into two groups, the first group received 8 mg of iv dexamethasone at the time of anaesthetic induction, while the second group received 10 mg of iv metocloplamide at the time of extubation. All patients were monitored in the recovery room for the first 24 hours for the occurrence of postoperative nausea and vomiting (PONV), intensity of PONV, need for rescue antiemetic, postoperative pain, side effects, and overall satisfaction scale in the recovery period.

Inclusion criteria:

- Patients aged 18–60 undergoing elective laparoscopic operations under general anesthesia.
- Classified as ASA I or II (usually healthy or minor systemic illness).

Exclusion criteria:

- Patients undergoing emergency or non-elective laparoscopy, as well as open operations like exploratory laparotomy.
- Diagnosed with diabetes or significant comorbidities such as liver or renal illness.
- Previous use of antiemetics within 24 hours; allergies or contraindications to Pramin or dexamethasone.
- Pregnancy and breastfeeding.

2.1.4 Sample Size

According, Entezariasl et al. (2010), sample size was calculated using a significance level (α) of 0.05 and a power (β) of 80%. In the recovery room, nausea was reported by 44% of the placebo group, 20% of the metoclopramide group, and 16% of the dexamethasone group. The "Comparing Two Proportions - Sample Size" tool found that 79 patients are required. To accommodate a possible 10% dropout rate, the sample size will be 90 individuals. The sampling process was based on a calculated sample size that ensured sufficient statistical power, with an adjustment made to account for potential dropout. An intentional (purposive) sampling strategy was applied, meaning patients were deliberately chosen to meet the study's objectives and criteria, ensuring that the required number of participants was achieved for valid and reliable analysis.

Table 1

Calculator of sample size

Calculator		
What confidence level do you need? Typical choices are 90%, 95% or 99%	95%	Info
What power do you need? A common choice is 80%	80%	Info
What do you believe the likely sample proportion in group 1 to be?	40%	Info
What do you believe the likely sample proportion in group 2 to be?	20%	Info
Your recommended sample size is	79	Info

2.1.5 Intervention

In this study, two groups received prophylactic antiemetics during general anesthesia for laparoscopic surgery.

Group M (Metoclopramide Group): Participants in this cohort were administered a solitary intravenous dosage of 10 mg metoclopramide hydrochloride (Pramin®) (1 ml) using a 2 mL syringe. Incorporate 1 ml of 0.09% normal saline to achieve a total volume of 2 ml immediately prior to extubation to prevent postoperative nausea and vomiting . 2. Group D (Dexamethasone Group): Patients in this group were given a single intravenous dosage of 8 mg dexamethasone in a 2 mL syringe during anesthesia induction to avoid PONV.

2.1.6 The variables

1. The dependent variables:

The dependent variables in this study are the use of rescue antiemetics, the incidence and severity of postoperative nausea and vomiting (PONV), the frequency of vomiting episodes, the incidence and intensity of postoperative pain, and patient satisfaction with postoperative outcomes. Furthermore, any side effects of the research medicines, such as headache, blurred vision, tremor, dizziness, or fatigue, were reported.

2. The independent variables:

The independent variables in this study comprise the administered antiemetic agents—dexamethasone and metoclopramide—along with the medications used during the induction and maintenance of general anesthesia, including their types and dosages, as well as the total volume of intraoperative fluid administration. The researcher also collected participant demographic information (age, weight, surgical duration, and anaesthetic duration) and physiological measures like blood pressure, heart rate, respiratory rate, temperature, and oxygen saturation (SpO_2).

2.1.7 Anesthesia and Surgical Procedure

Anesthesia Protocol:

Preoperative assessment involves reviewing a patient's medical, surgical, and anaesthetic history to identify PONV risk factors using tools such as the Apfel Simplified Risk Score.

This score considers four key predictors of PONV: female gender, postoperative opioid use, history of PONV or motion sickness, and nonsmoking status (Shastri & Krishna, 2023; Gan et al., 2014). The researcher studied all patents using the simplified Apfel Risk Score.

Patients were divided into two groups to prevent PONV. The metoclopramide group received 10 mg IV metoclopramide, and the dexamethasone group received 8 mg IV dexamethasone.

Participants were assigned to one of two groups to prevent PONV based on the prophylactic antiemetic they took. The metoclopramide group received 10 mg IV metoclopramide, and the dexamethasone group received 8 mg IV dexamethasone. Before anesthesia induction, patients received 1 mg Dormicum intravenously and 10 mL/kg lactated Ringer's solution. We monitored patients with ECG, non-invasive blood pressure, pulse oximetry, and capnography. After premedication, we induced general anesthesia with propofol (2 mg/kg) and fentanyl (2 μg/kg), then gave atracurium (0.5 mg/kg) to facilitate intubation. It was used endotracheal tubes sized 7.0-7.5 mm for females and 7.5-8.5 mm for males.

The researcher also maintained anesthesia with 1.2% sevoflurane in a 50% air/oxygen mixture. Ventilation was controlled to maintain an EtCO2 level between 35 and 40 mmHg. After surgery, the researcher reversed muscle relaxation with atropine (0.01 mg/kg) and neostigmine (0.05 mg/kg) before extubation. Patients received 1 g of Perfalgan intravenously at the onset of anesthesia, then 1 g every 6 hours for the first 24 postoperative hours.

Surgical Protocol: During the laparoscopic procedures, the patient was positioned in the reverse Trendelenburg position, and the peritoneal cavity was inflated with CO2 to a pressure of 13-15 mmHg. A nasogastric tube for stomach aspiration was kept in for some time before being withdrawn and suctioned again. Experienced surgeons performed all surgical operations to limit variability and ensure that patients had the same results (Perilli et al., 2000).

Postoperative Care and Monitoring: This involved the prevention and treatment of PONV, in particular, and pain in general in the postoperative period. Nausea was rated

using the Morrow Assessment of Nausea and Emesis (MANE) tool. This scale has an ordinal scale ranging from zero, referring to no nausea, to six, which in this case refers to intolerable nausea. The researchers also noted the following vomiting episodes: Patients with notable postoperative nausea and vomiting (defined as a MANE score of 3 or higher or two or more episodes of vomiting) were given an intravenous dose of a rescue antiemetic. In the Post-Anaesthesia Care Unit (PACU), patients received the therapy corresponding to their assigned group: either 10 mg of IV metoclopramide (Pramin) or 4 mg of IV dexamethasone, combined with 1 g of intravenous paracetamol. Importantly, patients who received dexamethasone intraoperatively were given metoclopramide as a rescue antiemetic, whereas individuals who received metoclopramide during surgery were given dexamethasone afterwards.

PONV episodes were closely observed for their pain scores, pulse oximetry, oral temperature, blood pressure, and respiratory rate. Following Extubation, patients' airways and breathing patterns were constantly examined, and oxygen was administered as needed based on their condition. In the postoperative period, outcome evaluations included checking for residual neuromuscular blockade and difficulties with respiration (Cammu, 2020).The adverse effects of study medicines, including headache, blurred vision, tremor, dizziness, and fatigue, were assessed based on their presence or absence.

2.1.8 Study Procedure

A total of 90 patients received general anesthesia for laparoscopic surgery at a selected hospital in the northern part of the West Bank. All subjects were grouped into either the American Society of Anesthesiologists (ASA) Class 1 (no systemic disease) or Class 2 (mild systemic disease). This study by (Entezariasl et al., 2010) shows that nausea in the recovery room was reported at 44% with placebo, 20% with metoclopramide, and 16% with dexamethasone. With these data, a sample size analysis was conducted at a power of 80% and a significance level (α) of 0.05. When using the “Comparing Two Proportions—Sample Size” calculator, the number of patients required was established as 79, with an additional contingency of 10% to account for patients who may not show up, resulting in a total of 90 patients. Patients with diabetes mellitus, those who had a previous allergic reaction to any of the study drugs, or those who had taken antiemetics in the past, were excluded from the study. All participants voluntarily signed informed consent after the study was explained to them one hour before surgery. The trial followed

ethical standards set by the Institutional Review Board (IRB) of An Najah National University. Participants were informed they could withdraw from the study at any time without affecting their medical treatment.

Preoperatively, all patients received information about the trial and completed consent forms. Patients completed the Apfel Risk Score to assess their risk of PONV (Apfel et al., 1999), We divided participants into two treatment groups:

1. Group M (Metoclopramide Group): Patients received 10 mg metoclopramide hydrochloride (Pramin®) intravenously in a 2 mL syringe before extubation to prevent PONV.
2. Group D (Dexamethasone Group): Patients received 8 mg dexamethasone intravenously in a 2 mL syringe during anaesthesia induction to prevent PONV.

All patients followed the same anaesthetic protocol. Patients were pre-oxygenated for three minutes with 100% oxygen before induction. Patients received 1 mg Dormicum intravenously, followed by propofol (2 mg/kg) and fentanyl (2 μg/kg) for anaesthesia induction. Then, they were given atracurium (0.5 mg/kg) to facilitate tracheal intubation. Anaesthesia was maintained with 1.2% sevoflurane in a 50% oxygen-air mixture. The researcher adjusted the ventilator settings to maintain an end-tidal CO2 level between 35 and 40 mmHg.

All patients received 10 mL/kg of lactated Ringer's solution. Each patient received 1 g of IV Perfalgan every six hours for postoperative pain relief. ETT placement was clinically verified using auscultation, chest wall movement, and capnography, along with an acceptable SpO_2, before tube fixation. ECG, capnography, temperature, pulse oximetry, and noninvasive blood pressure were monitored every five minutes intraoperatively. The anaesthesia was further maintained using Intermittent Positive Pressure Ventilation (IPPV) with a tidal volume set at 7 mL/kg and a rate of 12-16 breaths per minute, supplemented with 50% O2 and 1.2% sevoflurane.

Postoperatively, sevoflurane was discontinued, and neuromuscular blockade was reversed with intravenous neostigmine (0.05 mg/kg) and atropine (0.01 mg/kg) to counteract any residual blockade. The process of extubation was performed after confirming that the patient was able to breathe adequately on their own, maintain

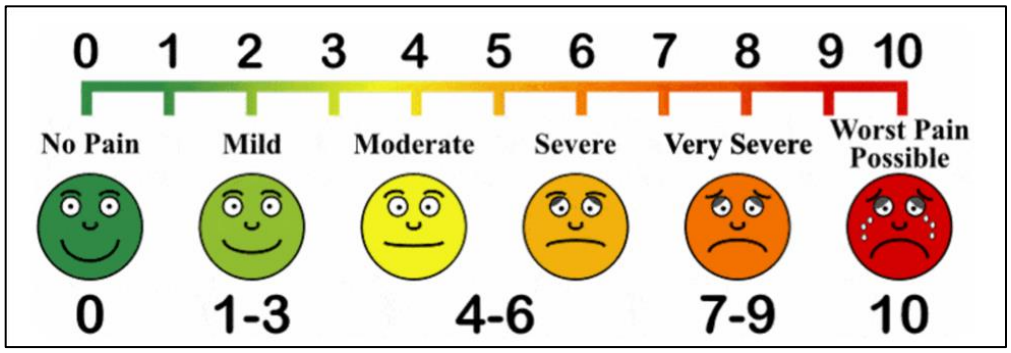
appropriate postoperative responses to commands, and had normal or stable vital signs. The operating and anaesthesia durations for each patient were also documented. In the operating room, the patients' vital signs, including blood pressure, pulse, respiratory rate, and oxygen saturation, were recorded immediately after surgery and then again in the recovery room. A simple face mask was used to administer oxygen at a flow rate of 5 L/min, and it was withdrawn immediately once the patient was stable and ready for transfer to the ward. Postoperative nausea and vomiting were measured by direct questioning shortly after regaining consciousness, on arrival, two hours, six hours, twelve hours, and twenty-four hours in the ward. Vomiting was classified as vomiting, whereas nausea was present or absent. Other rescue antiemetics were given whenever patients had moderate to severe nausea by assessing their Likert scores (rating 3 or higher on a Likert scale) and had vomiting twice or more. 10 mg of intravenous metoclopramide (Pramin®) was given to patients who had received prophylactic dexamethasone in case they required rescue antiemetic treatment.

In contrast, 4 mg of intravenous dexamethasone was administered as a rescue medication to individuals in the metoclopramide group. In order to control postoperative pain, 1 g of intravenous paracetamol was also administered to each patient. Regular evaluations of pain levels were conducted, and in the event that the antiemetic response was insufficient, further doses of metoclopramide were administered as the final option.

Assessment of Nausea and Vomiting in the Postoperative Anesthetic Care Unit (PACU): The degree of nausea will be measured on an ordinal Likert scale, which will range from 0 (no nausea) to 6 (nausea that is intolerable). When the rating was 3 or above, the antiemetic rescue medication was either 10 mg of intravenous metoclopramide or 4 mg of intravenous dexamethasone, depending on the criteria by which participants were allocated to the group. Adverse effects that may be associated with metoclopramide and/or dexamethasone, like headache, fatigue, dizziness, and blurred vision, were assessed with a simple 'Yes/No' scale. Pain was measured using a Visual Analogue Scale (VAS) scale with scores from 0 –'no pain' and 10–'worst pain ever'.

Figure 1

Visual Analogue Scale (VAS) for pain assessment



Post-PACU release Monitoring: Following PACU release, postoperative surveillance will be performed at 2, 6, 12, and 24 hours to document nausea, vomiting, and other symptoms. The Morrow Assessment of Nausea and Emesis (MANE) scale will be used to assess nausea intensity, with degrees of nausea defined as 0 = not at all, 1 = very light, 2 = mild, 3 = moderate, 4 = severe, 5 = very severe, and 6 = intolerable. Vomiting will be evaluated based on frequency. If vomiting occurs more than twice, rescue antiemetics will be supplied. Patient satisfaction with PONV treatment will be measured using a Visual Analogue Scale (VAS), which ranges from 0 (extremely dissatisfied) to 10 (extremely satisfied).

The Patient Satisfaction Assessment: A Visual Analogue Scale (VAS) is going to be used to assess patient satisfaction with nausea and vomiting management, on a scale of 0 (extremely unsatisfied) to 10 (very satisfied). This assessment will determine the overall efficacy of antiemetic medication from the patient's perspective.

Figure 2

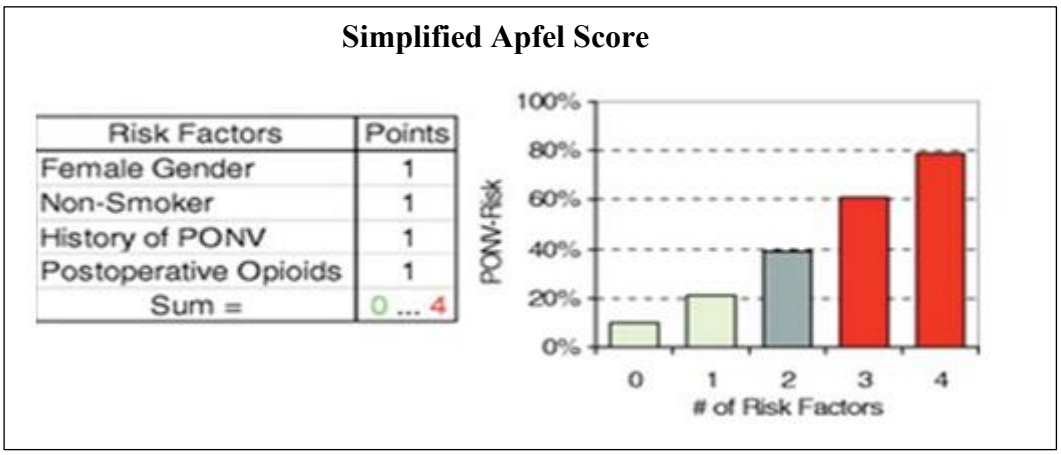
Visual Analog Scale (VAS) for Patient Satisfaction

2.1.9 Validity and Reliability

A previous study showed that the Likert scale for measuring nausea has excellent test-retest reliability (McHorney et al., 2018). The scale's reliability in this study was determined using Cronbach's alpha, measured with SPSS software. A reliability of 70% (0.7) was considered acceptable.

Figure 3

Apfel Simplified Risk Score for PONV



2.2 Ethical Considerations

- Ethical Approval: The study was approved by the Institutional Review Boards of An Najah National University and the research committee of the Ministry of Health
- Adherence to Ethical Guidelines: The research was conducted in accordance with the principles outlined in the Declaration of Helsinki.
- Informed Consent: The participants' informed written consent was sought from all participants before they were recruited into the study. These include the subject of the study, the purpose of the study, the procedures that the participant will be subjected to, and the possible risks and benefits of the intervention. It is also noted that the participant has the full right to withdraw from the study at any time without providing a reason.
- Participant Information: Participants will commit to the study after being informed of all aspects of the research in simple language. They will be allowed ample time to review the consent form, ask any questions they may have, discuss them with other individuals, and make their decision about participation.

- Confidentiality and Data Protection: To prevent participants' identification, their details will not be included in the collected data and will instead be replaced with identification numbers assigned to each participant for documentation and storage purposes. All data will be recorded on password-protected software, and as such, access rights will be strictly limited to the researchers only. The study will adhere to data protection legislation, particularly the General Data Protection Regulation (GDPR), as the fundamental principles of research require the protection of participants' identities.

2.3 Statistical Analysis

The statistical package for social science SPSS version 25 is used for data analysis in this research. Descriptive statistics (Frequencies, Percentages, Means, and Standard Deviations (SD)) were computed. The frequencies and percentages will be displayed in the analysis and in the tables as N (%) while the Means and Standard Deviations will be displayed as Mean ± S.D. The following statistical tests and methods were used to analyse the results assuming that the statistical test with the P-value less than or equal to 0.05 is significant:

1. The Chi-Square test with Fisher Exact test adjustment for small counts: the test is used to test the differences in percentages between the two drug groups (Metoclopramide, Dexamethasone) for the qualitative (categorical) variables, these variables in the study are: Type of surgery, History of PONV, Apfel Simplified Risk Score based on four independent risk factors which are the planning for Opioid Use, Smoking Status, History of Motion Sickness, Incidence of Nausea, Incidence of Vomiting, Incidence of Headache, Antiemetic Rescue Medication, Incidence of Tremor, Incidence of Fatigue, Incidence of Dizziness, Incidence of Blurred Vision, and the Side Effects.
2. The two independent samples T-test adjusted for unequal variances: the test is used to test the differences in means between the two drug groups for the quantitative (scale) variables, these variables in the study are: Age, Body Mass Index, Height, Weight, Surgical Variables, Intensity of Nausea, Pain, and Satisfaction (VAS Scale).

Chapter Three

Result

Demographic Data

The study sample consisted of 90 patients who underwent laparoscopic surgeries. The patients are partitioned into two groups: 45 patients were given Metoclopramide and 45 patients were given Dexamethasone in order to study and compare the efficacy of the two drugs in avoiding PONV in patients having laparoscopic surgery under general anesthesia. The patients have an average age of 46.29 ± 12.1. Most of the patients in the sample underwent a Laparoscopic Cholecystectomy surgery (approximately 66%), while the other patients underwent a Laparoscopic Appendectomy surgery (approximately 34%). Approximately 42% of the patients are smokers, and the average weight of the patients is 74.24 ± 14.85 kg, with an average height of 162.41 ± 19.65 cm, resulting in a BMI average of 26.32 ± 3.38. The results are shown in Table 2.

The results in the next table 2 show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the demographic data:

Table 2

Comparisons between Metoclopramide drug and Dexamethasone drug in regard of the demographic data (N=90)

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Age in years	44.82 ± 10.88	47.76 ± 13.17	46.29 ± 12.1	0.253
Type of surgery				
Laparoscopic Appendectomy	16(35.6%)	15(33.3%)	31(34.4%)	0.824
Laparoscopic Cholecystectomy	29(64.4%)	30(66.7%)	59(65.6%)	
History of PONV	2(4.4%)	0(0%)	2(2.2%)	0.153
History of Motion Sickness	12(26.7%)	4(8.9%)	16(17.8%)	0.027
Planning for Opioid Use	0(0%)	0(0%)	0(0%)	----
Smoking Status	23(51.1%)	15(33.3%)	38(42.2%)	0.088
Apfel Simplified Risk Score (%) Opioid Use Smoking Status History of Motion Sickness History of PONV				
0%	15(33.3%)	13(28.9%)	28(31.1%)	0.151
20%	10(22.2%)	13(28.9%)	23(25.6%)	
40%	9(20%)	15(33.3%)	24(26.7%)	
60%	11(24.4%)	4(8.9%)	15(16.7%)	
80%	0(0%)	0(0%)	0(0%)	
Weight in kg	72.96 ± 13.71	75.53 ± 15.96	74.24 ± 14.85	0.413
Height in cm	167.53 ± 8.03	157.29 ± 25.74	162.41 ± 19.65	0.013
Body Mass Index	25.81 ± 3.56	26.82 ± 3.14	26.32 ± 3.38	0.157

The results in the Table 2 show that there are significant differences at the level of 0.05 between the two drug groups in regards of the history of motion sickness; the p-value of the test is 0.027, and the results show that the percentage of patients who have history of motion sickness in Metoclopramide group (n=12, p=26.7%) is significantly higher than that in the Dexamethasone group (n=4, p=8.9%).

Surgical Variables

The results also show significant differences between the two drug groups in terms of patient height. Metoclopramide patients were taller on average compared to dexamethasone patients (167.53 vs. 157.29 cm, p = 0.013). The results in the table 2 show the analysis of differences between the metoclopramide and dexamethasone groups in terms of surgical variables.

Table 3

Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the Surgical Variables (N=90)

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Total Fentanyl (µg)	141.11 ± 55.69	153.33 ± 64.31	147.22 ± 60.13	0.338
Total Propofol (mg)	167.78 ± 56.56	161.33 ± 45.71	164.56 ± 51.24	0.554
End-tidal Sevoflurane Concentration (%)	1.2 ± 0	1.2 ± 0	1.2 ± 0	1.000
End-tidal CO2 (mmHg)	35.8 ± 2.83	34.47 ± 1.25	35.13 ± 2.28	0.005
Duration of Surgery (min)	70.11 ± 15.65	81.44 ± 18.24	75.78 ± 17.83	0.002
Duration of Anesthesia (min)	93.11 ± 18.16	99.56 ± 21.89	96.33 ± 20.26	0.132
Intraoperative Fluid Intake (ml)	1368.89 ± 240.1	1371.11 ± 237.05	1370 ± 237.24	0.965
Intraoperative FIO2 (%)	50 ± 0	50 ± 0	50 ± 0	----

The results in Table 3 show significant differences between the two drug groups in terms of end-tidal CO2. Metoclopramide patients had higher end-tidal CO2 levels compared to dexamethasone patients (35.8 vs. 34.47 mmHg, p = 0.005). The results also show significant differences between the two drug groups in terms of surgery duration. Patients treated with metoclopramide had shorter surgery times compared to those treated with dexamethasone (70.11 vs. 81.44 minutes, p = 0.002).

Postoperative Monitoring In PACU

The results in Table 4 show the analysis of differences between the metoclopramide and dexamethasone groups in terms of postoperative monitoring variables in the PACU.

Table 4

*Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the postoperative monitoring variables in PACU (N=90)**

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Incidence of Nausea in PACU	32(71.1%)	24(53.3%)	56(62.2%)	0.082
Intensity of Nausea in PACU	1.82 ± 1.35	1.07 ± 1.16	1.44 ± 1.31	0.005
Incidence of Vomiting in PACU	3(6.7%)	0(0%)	3(3.3%)	0.242
Antiemetic Rescue Medication in PACU	20(44.4%)	7(15.6%)	27(30%)	0.003
Incidence of Headache in PACU	33(73.3%)	19(42.2%)	52(57.8%)	0.003
Incidence of Fatigue in PACU	35(77.8%)	21(46.7%)	56(62.2%)	0.002
Incidence of Dizziness in PACU	25(55.6%)	20(44.4%)	45(50%)	0.292
Incidence of Blurred Vision in PACU	15(33.3%)	4(8.9%)	19(21.1%)	0.004
Incidence of Tremor in PACU	16(35.6%)	0(0%)	16(17.8%)	0.000

*Intensity of Nausea is a scale (0-6).

The results in Table 4 show significant differences between the two drug groups in terms of nausea intensity in the PACU. Metoclopramide patients had higher nausea intensity compared to dexamethasone patients (1.82 vs. 1.07, $p = 0.005$). The results also show significant differences between the two drug groups in terms of antiemetic rescue medication in PACU. Several metoclopramide patients required rescue medications compared to dexamethasone patients (44.4% vs. 15.6%, $p = 0.003$). The results also show significant differences between the two drug groups for headache incidence in the PACU. More metoclopramide patients experienced headaches compared to dexamethasone patients (73.3% vs. 42.2%, $p = 0.003$).

The results also show significant differences between the two drug groups in terms of fatigue incidence in PACU. Many metoclopramide patients experienced fatigue compared to dexamethasone patients (77.8% vs. 46.7%, $p = 0.002$). The results show significant differences between the two drug groups in terms of the incidence of blurred vision in the PACU. In the same context, many metoclopramide patients experienced blurred vision compared to dexamethasone patients (33.3% vs. 8.9%, $p = 0.004$). Finally, the results show significant differences between the two drug groups in terms of tremor incidence in PACU. Other metoclopramide patients experienced tremors compared to dexamethasone patients (35.6% vs. 0%, $p < 0.001$).

Postoperative Monitoring In the Ward (Arrival-24th Hours)

Incidence of Nausea (Arrival-24th Hours)

The results in Table 5 show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the incidence of nausea in the ward:

Table 5

Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the incidence of nausea in the ward (N=90)

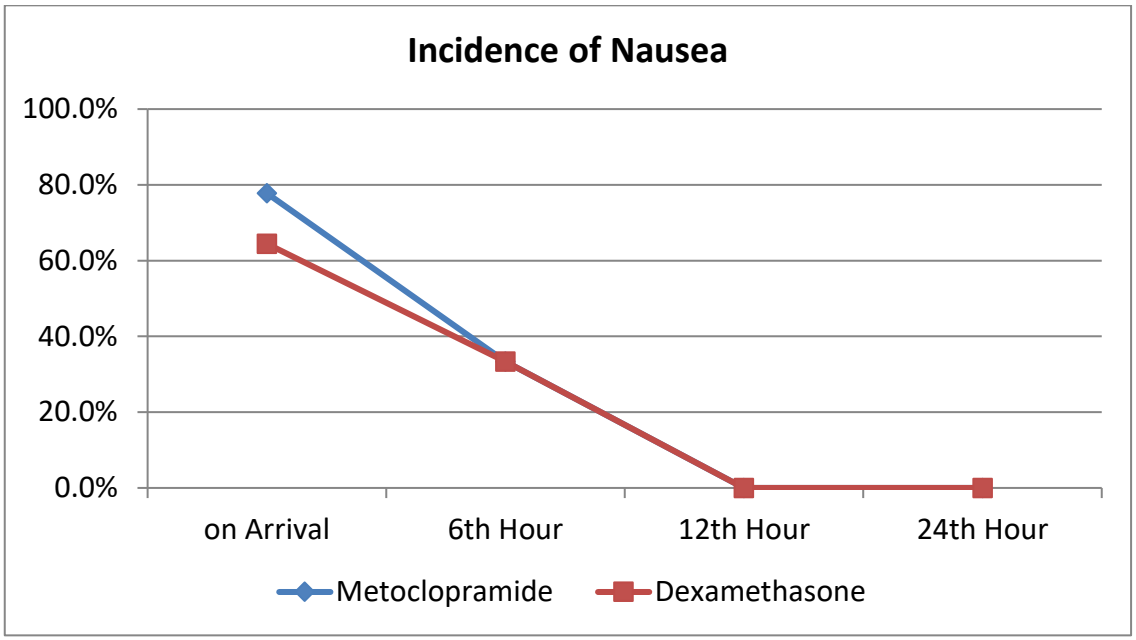
Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Incidence of Nausea on Arrival	38(84.4%)	27(60%)	65(72.2%)	0.010
Incidence of Nausea at 6th Hour	15(33.3%)	15(33.3%)	30(33.3%)	1.000
Incidence of Nausea at 12th Hour	0(0%)	0(0%)	0(0%)	----
Incidence of Nausea at 24th Hour	0(0%)	0(0%)	0(0%)	----
Total Incidence of Nausea in Ward (Arrival-24th Hours)	38(84.4%)	30(66.7%)	68(75.6%)	0.048
Total Number of Times of Incidence of Nausea in the Ward (Arrival-24th Hours)	53/180(29.4%)	42/180(23.3%)	94/360(26.1%)	0.259

The results in Table 5 show that there are significant differences at the 0.05 level between the two drug groups regarding the Incidence of Nausea on Arrival in the Ward. The p-value of the test is 0.010, and the results show that the percentage of patients who have incidence of nausea on arrival in the Ward in Metoclopramide group (n=38, p=84.4%) is significantly higher than that in the Dexamethasone group (n=27, p=60%).

The results also show that there are significant differences at the level of 0.05 between the two drug groups in regards of the Total Incidence of Nausea in the Ward. The p-value of the test is 0.048, and the results show that the percentage of patients who have incidence of nausea totally in Metoclopramide group (n=38, p=84.4%) is significantly higher than that in the Dexamethasone group (n=30, p=66.7%).

Figure 4

Incidence of Nausea Postoperative Monitoring In the Ward (Arrival-24th Hours)



Intensity of Nausea (Arrival-24th Hours)

The results in Table 6 show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the intensity of nausea in the ward:

Table 6

*Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the intensity of nausea in the ward (N=90)**

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Intensity of Nausea on Arrival	1.78 ± 1.02	1.16 ± 1.07	1.47 ± 1.08	0.006
Intensity of Nausea at 6th Hour	0.69 ± 0.9	0.62 ± 1.11	0.66 ± 1.01	0.756
Intensity of Nausea at 12th Hour	0.13 ± 0.5	0.13 ± 0.5	0.13 ± 0.5	1.000
Intensity of Nausea at 24th Hour	0.13 ± 0.5	0 ± 0	0.07 ± 0.36	0.080
Total Intensity of Nausea in the Ward (Arrival-24th Hours)	0.68 ± 0.48	0.51 ± 0.55	0.6 ± 0.52	0.010**

*Intensity of Nausea is a scale (0-6). ** The p-value is due to the Mann-Whitney Test

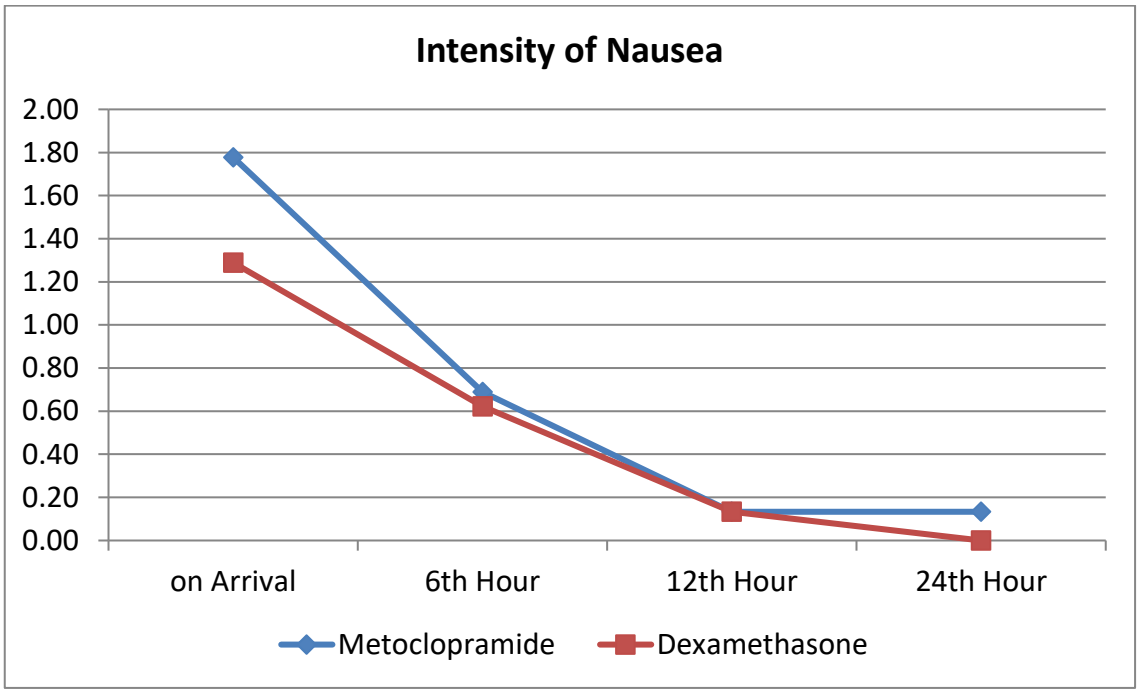
The results in the Table 6 show that there are significant differences at the level of 0.05 between the two drug groups in regards of the Intensity of Nausea on Arrival

in the Ward. The p-value of the test is 0.006, and the results show that the mean intensity of nausea on arrival in the Ward for patients in the Metoclopramide group (Mean = 1.78) is significantly higher than that in the Dexamethasone group (Mean = 1.16).

The results also show that there are significant differences at the level of 0.05 between the two drug groups in regards of the Total Intensity of Nausea in the Ward. The p-value of the test is 0.010, and the results show that the mean total intensity of nausea in the ward for patients in the Metoclopramide group (Mean = 0.68) is significantly higher than that in the Dexamethasone group (Mean = 0.51).

Figure 5

Intensity of Nausea Intensity of Nausea (Arrival-24th Hours)



Incidence of Vomiting (Arrival-24th Hours)

The results in the next Table 7 show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the incidence of vomiting in the ward:

Table 7

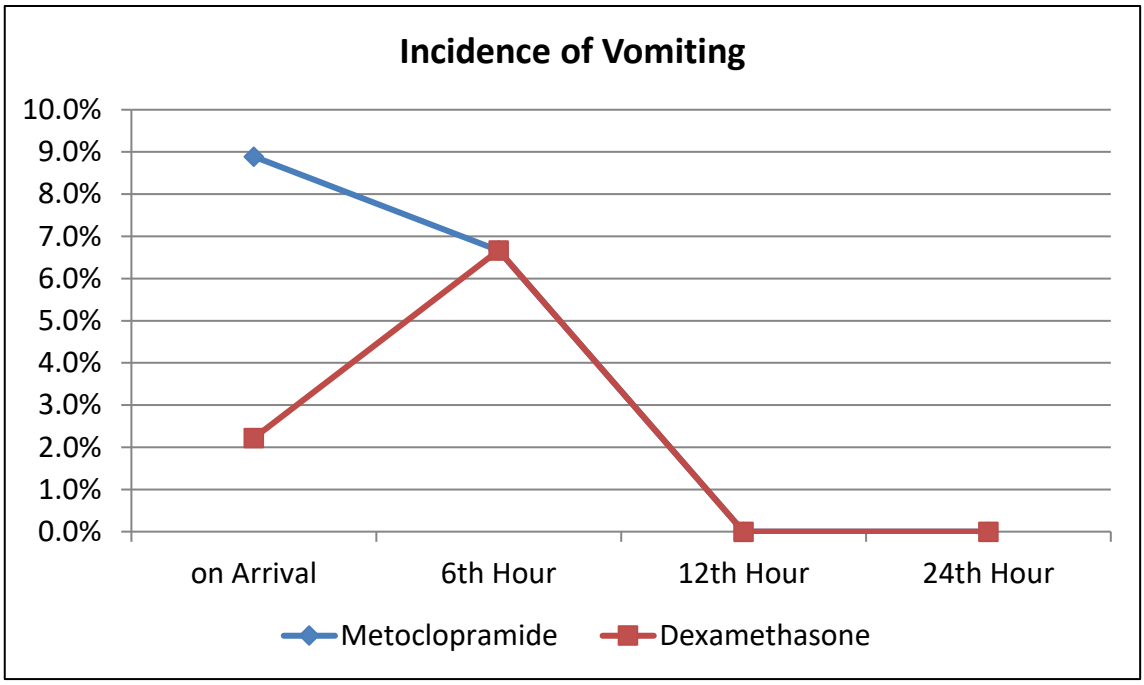
Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the incidence of vomiting in the ward (N=90)

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Incidence of Vomiting on Arrival	4(8.9%)	1(2.2%)	5(5.6%)	0.167
Incidence of Vomiting at 6th Hour	3(6.7%)	3(6.7%)	6(6.7%)	1.000
Incidence of Vomiting at 12th Hour	0(0%)	0(0%)	0(0%)	----
Incidence of Vomiting at 24th Hour	0(0%)	0(0%)	0(0%)	----
Total Incidence of Vomiting in the Ward (Arrival-24th Hours)	7(15.6%)	4(8.9%)	11(12.2%)	0.334
Total Number of Times of Incidence of Vomiting in the Ward (Arrival-24th Hours)	7/180(3.9%)	4/180(2.2%)	11/360(3.1%)	0.366

The results in Table 7 show that there are no significant differences at the level of 0.05 between the two drug groups in regards of the Incidence of Vomiting in the Ward, since all the p-values of the test are higher than the level of 0.05.

Figure 6

Incidence of Vomiting (Arrival-24th Hours)



Rescue Medication (Arrival-24th Hours)

The results in Table 8 show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the incidence of rescue medication in the ward:

Table 8

Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the incidence of rescue medication in the ward (N=90)

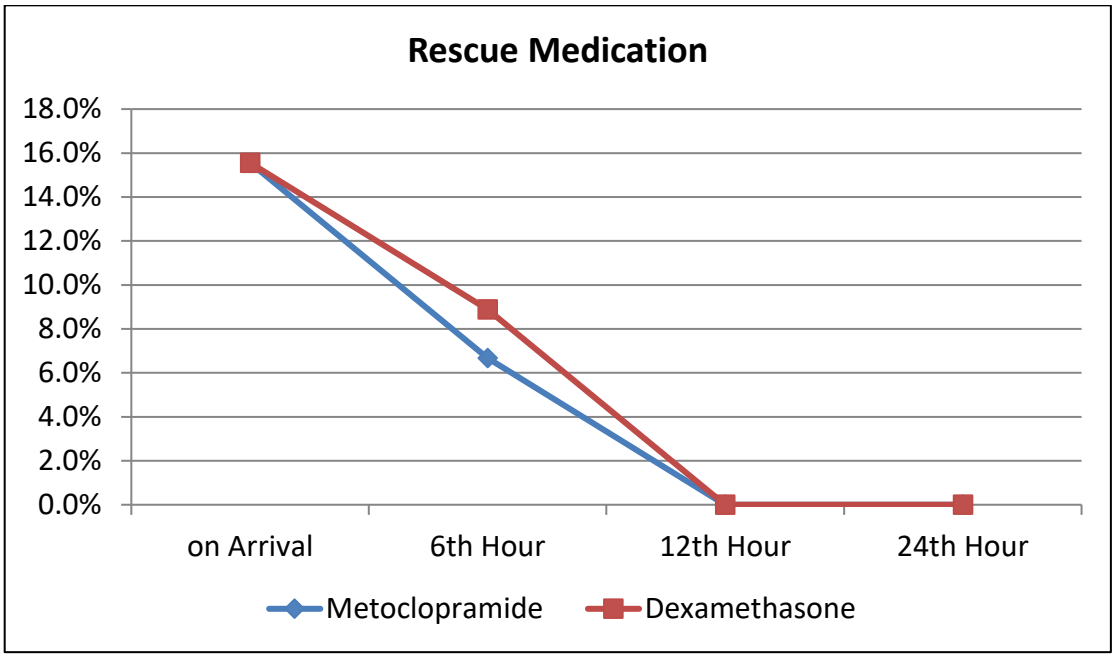
Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Rescue Medication on Arrival	3(6.7%)	7(15.6%)	10(11.1%)	0.180
Rescue Medication at 6th Hour	0(0%)	8(17.8%)	8(8.9%)	0.006
Rescue Medication at 12th Hour	0(0%)	0(0%)	0(0%)	----
Rescue Medication at 24th Hour	0(0%)	0(0%)	0(0%)	----
Total Rescue Medication in the Ward (Arrival-24th Hours)	3(6.7%)	15(33.3%)	18(20%)	0.002
Total Number of Times of Rescue Medication in the Ward (Arrival-24th Hours)	3/180(1.7%)	15/180(8.3%)	18/360(5%)	0.005

The results in Table 8 show that there are significant differences at the level of 0.05 between the two drug groups in regards of the Rescue Medication at 6 Hours. The p-value of the test is 0.006, and the results show that the percentage of patients who have rescue medication at 6 hours in the Metoclopramide group (n=0, p=0%) is significantly lower than that in the Dexamethasone group (n=8, p=17.8%).

The results also show significant differences at the 0.05 level between the two groups for total rescue medication use (p-value = 0.002). Fewer patients in the metoclopramide group required rescue medication (n=3, 6.7%) compared to the dexamethasone group (n=15, 33.3%). Additionally, there were significant differences between the groups for the total number of rescue medication doses (p-value = 0.005). The metoclopramide group had fewer rescue medication instances (n=3, 1.7%) compared to the dexamethasone group (n=15, 8.3%).

Figure 7

Rescue Medication (Arrival-24th Hours)



Incidence of Headache (Arrival-24th Hours)

The results in Table 9 show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the incidence of headache in the ward:

Table 9

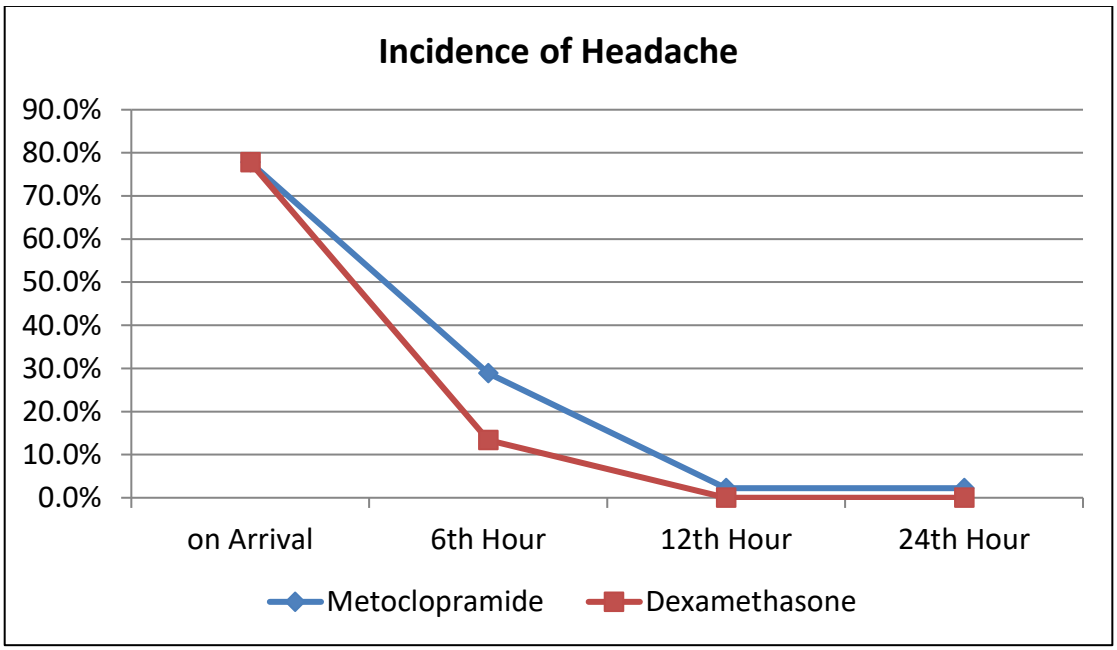
Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the incidence of headache in the ward (N=90)

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Incidence of Headache on Arrival	35(77.8%)	35(77.8%)	70(77.8%)	1.000
Incidence of Headache at 6th Hour	13(28.9%)	6(13.3%)	19(21.1%)	0.071
Incidence of Headache at 12th	1(2.2%)	0(0%)	1(1.1%)	0.315
Incidence of Headache at 24th	1(2.2%)	0(0%)	1(1.1%)	0.315
Total Incidence of Headache in the Ward (Arrival-24th Hours)	35(77.8%)	35(77.8%)	70(77.8%)	1.000
Total Number of Times of Incidence of Headache in the Ward (Arrival-24th Hours)	50/180(27.8%)	41/180(22.8%)	91/360(25.3%)	0.345

The results in Table 9 show that there are no significant differences at the level of 0.05 between the two drug groups in regards of the Incidence of Headache in the Ward, since all the p-values of the test are higher than the level of 0.05.

Figure 8

Incidence of Headache (Arrival-24th Hours)



Incidence of Fatigue (Arrival-24th Hours)

The results in Table 10 show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the incidence of fatigue in the ward:

Table 10

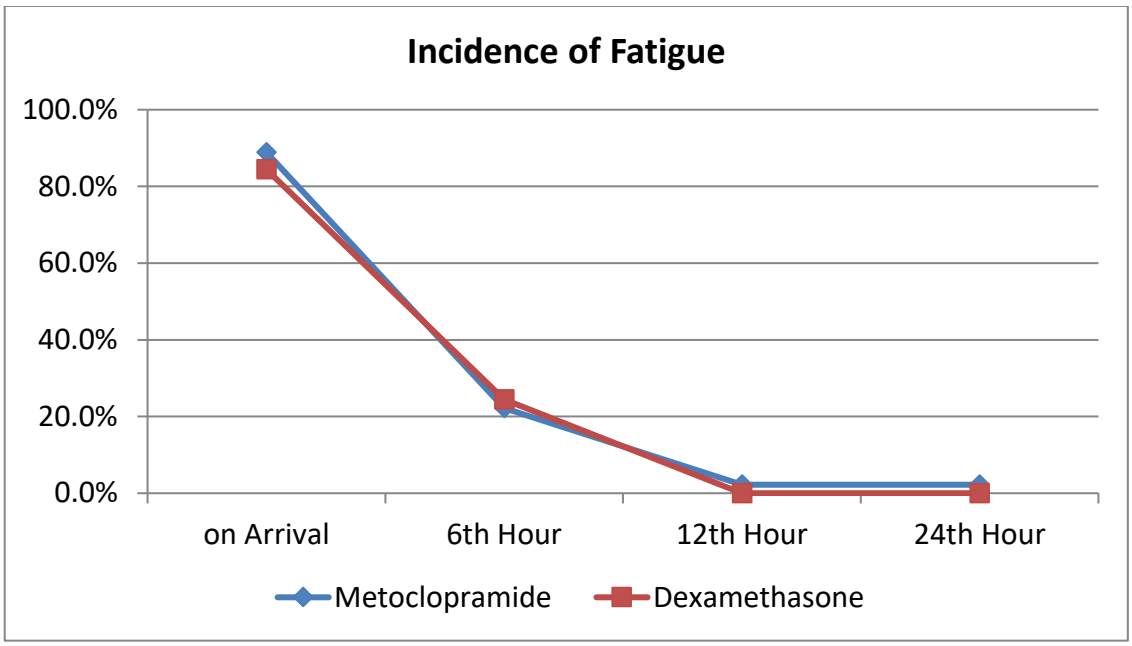
Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the incidence of fatigue in the ward (N=90)

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Incidence of Fatigue on Arrival	40(88.9%)	38(84.4%)	78(86.7%)	0.535
Incidence of Fatigue at 6th Hour	10(22.2%)	11(24.4%)	21(23.3%)	0.803
Incidence of Fatigue at 12th Hour	1(2.2%)	0(0%)	1(1.1%)	0.315
Incidence of Fatigue at 24th Hour	1(2.2%)	0(0%)	1(1.1%)	0.315
Total Incidence of Fatigue in the Ward (Arrival-24th Hours)	40(88.9%)	38(84.4%)	78(86.7%)	0.535
Total Number of Times of Incidence of Fatigue in the Ward (Arrival-24th Hours)	52/180(28.9%)	49/180(27.2%)	101/360(28.1%)	0.765

The results in Table 10 show that there are no significant differences at the level of 0.05 between the two drug groups in regards of the Incidence of Fatigue in the Ward, since all the p-values of the test are higher than the level of 0.05.

Figure 9

Incidence of Fatigue (Arrival-24th Hours)



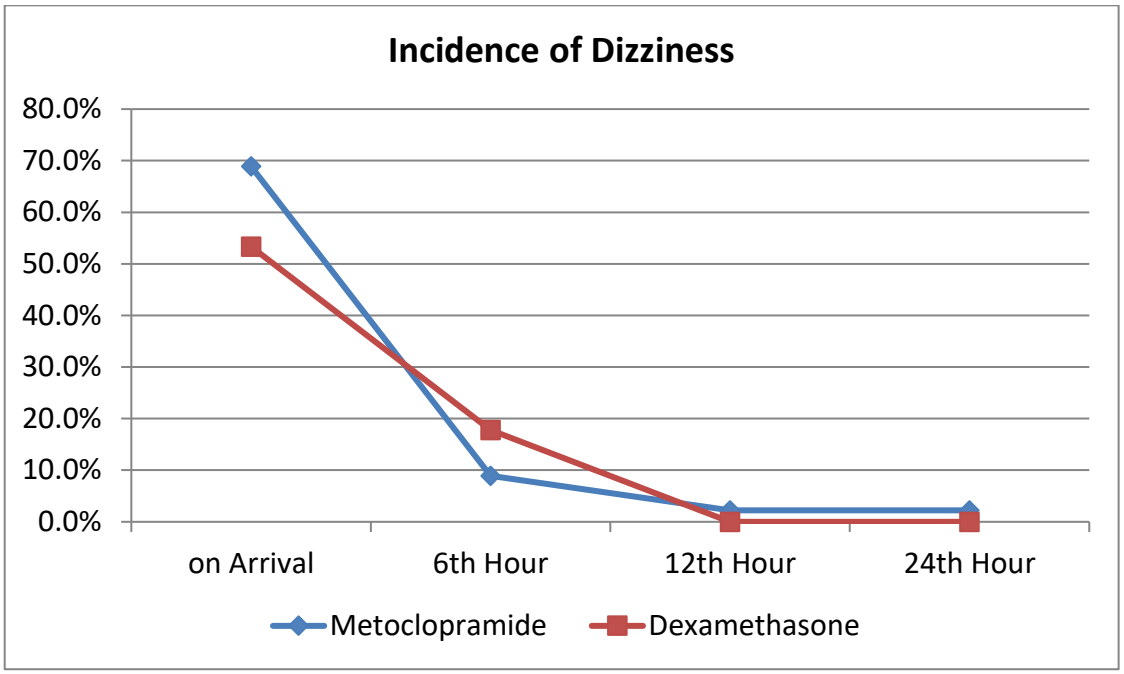
Incidence of Dizziness (Arrival-24th Hours)

The results in Table E.1 in (appendix E) show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the incidence of dizziness in the ward:

The results in Table E.1 in (appendix E) show that there are no significant differences at the level of 0.05 between the two drug groups in regards of the Incidence of Dizziness in the Ward, since all the p-values of the test are higher than the level of 0.05.

Figure 10

Incidence of Dizziness (Arrival-24th Hours)



Incidence of Blurred Vision (Arrival-24th Hours)

The results in Table E.2 in (appendix E) show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the incidence of blurred vision in the ward:

The results in Table E.2 in (appendix E) show that there are significant differences at the level of 0.05 between the two drug groups in regards of the Incidence of Blurred Vision on Arrival in the Ward; the p-value of the test is 0.026, and the results show that the percentage of patients who have incidence of blurred vision on arrival in the Ward in Metoclopramide group (n=6, p=13.3%) is significantly higher than that in the Dexamethasone group (n=0, p=0%).

Incidence of tremor (Arrival-24th Hours)

The results in Table E.3 in (appendix E) show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the incidence of tremor in the ward:

The results in Table E.3 in (appendix E) show that there are significant differences at the level of 0.05 between the two drug groups in regards of the Incidence of tremor on Arrival

in the Ward; the p-value of the test is 0.001. The results show that the percentage of patients who have incidence of tremor on arrival in the ward in Metoclopramide group (n=10, p=22.2%) is significantly higher than that in the Dexamethasone group (n=0, p=0%).

Also, the results show that there are significant differences at the level of 0.05 between the two drug groups in regards of the Total Incidence of tremor in the Ward; the p-value of the test is 0.004, and the results show that the percentage of patients who have incidence of tremor in the ward totally in Metoclopramide group (n=10, p=22.2%) is significantly higher than that in the Dexamethasone group (n=1, p=2.2%).

In addition, the results show that there are significant differences at the 0.05 level between the two drug groups regarding the Total Number of Times of tremor incidence in the Ward; the p-value of the test is 0.007. The results show that the percentage of tremor incidence in the ward in the Metoclopramide group (n=10, p=5.6%) is significantly higher than that in the Dexamethasone group (n=1, p=0.6%).

Postoperative Monitoring In the Ward (Arrival-6 Hours)

Incidence of Nausea (Arrival-6 Hours)

The results in table Table E.4 in (appendix E) show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the incidence of nausea in the ward:

The results in Table E.4 in (appendix E) show that there are significant differences at the level of 0.05 between the two drug groups in regards of the Incidence of Nausea on Arrival; the p-value of the test is 0.010. The results show that the percentage of patients with an incidence of nausea on arrival in the Metoclopramide group (n=38, 84.4%) is significantly higher than that in the Dexamethasone group (n=27, 60%).

The results also show that there are significant differences at the 0.05 level between the two drug groups regarding the Total Incidence of Nausea. The p-value of the test is 0.05, and the results show that the percentage of patients with a total incidence of nausea in the Metoclopramide group (n=38, 84.4%) is significantly higher than that in the Dexamethasone group (n=30, 66.7%).

Intensity of Nausea (Arrival-6 Hours)

The results in the next Table E.5 in (appendix E) show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the intensity of nausea in the ward:

The results in Table E.5 in (appendix E) show that there are significant differences at the 0.05 level between the two drug groups regarding the Intensity of Nausea on Arrival; the p-value of the test is 0.006. The results show that the mean intensity of nausea on arrival for patients in the Metoclopramide group (Mean = 1.78) is significantly higher than that in the Dexamethasone group (Mean = 1.16).

Rescue Antiemetics (Arrival-6 Hours)

The results in the next table Table E.6 in (appendix E) show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the Antiemetics in the ward:

The results in Table E.6 in (appendix E) show that there are significant differences at the level of 0.05 between the two drug groups in regards of the Antiemetics at 6 Hours. The p-value of the test is 0.006, and the results show that the percentage of patients who have antiemetics at 6 hours in Metoclopramide group (n=0, p=0%) is significantly lower than that in the Dexamethasone group (n=8, p=17.8%).

The results also show significant differences between the two drug groups in terms of total antiemetics. Fewer metoclopramide patients needed antiemetics compared to dexamethasone patients (6.7% vs. 33.3%, p = 0.002).

In addition, the results show that there are significant differences at the level of 0.05 between the two drug groups in regards of the Total Number of Times of Antiemetics.

The p-value of the test is 0.005, and the results show that the percentage of antiemetics in Metoclopramide group (n=3, p=1.7%) is significantly lower than that in the Dexamethasone group (n=15, p=8.3%).

Pain (Arrival-6 Hours)

Table E.7 (in appendix E) shows the pain analysis comparing the metoclopramide and dexamethasone groups. The results reveal a significant difference at the 0.05 level

between the two groups for pain at 2 hours. With a p-value of 0.048, patients in the metoclopramide group had significantly higher pain scores (mean=3.07) compared to the dexamethasone group (mean=2.82). The results also show that there are significant differences at the level of 0.05 between the two drug groups in regards of the Pain at 4 Hours. The p-value of the test is 0.039, and the results show that the mean pain level at 4 hours for patients in the Metoclopramide group (Mean = 2.42) is significantly higher than that in the Dexamethasone group (Mean = 2.11).

Side Effects (Arrival-6 Hours)

The results in Table E.8 in (appendix E) show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the side effects:

The results in Table E.8 in (appendix E) show that there are no Side Effects results in the two drug groups in the study time from arrival to 6 hours.

Satisfaction (VAS Scale) (Arrival-6 Hours)

The results in Table E.9 in (appendix E) show the analysis of differences between the Metoclopramide drug group and the Dexamethasone drug group in regards of the satisfaction:

The results in Table E.9 in (appendix E) show that there are significant differences at the 0.05 level between the two drug groups regarding the Satisfaction (VAS) Scale on Arrival. The p-value of the test is 0.049, and the results show that the mean of satisfaction scale on arrival for the patients in Metoclopramide group (Mean=2.78) is significantly lower than that in the Dexamethasone group (Mean=2.96).

Chapter Four

Discussion

4.1 Introduction

The study compared prophylactic IV metoclopramide (10 mg) before extubation with dexamethasone (8 mg) at induction for preventing PONV after laparoscopic surgery. Metoclopramide showed poorer outcomes, with higher nausea intensity, more rescue antiemetic use, and increased side effects (headache, fatigue, blurred vision, and tremor) both in the PACU and during the first 24 hours postoperatively.

Demographic Data

The results of the groups were similar, except for a history of motion sickness, as 26.7% of metoclopramide patients reported motion sickness, compared to 8.9% of dexamethasone patients ($p = 0.027$). A history of motion sickness increases the risk of nausea after surgery (Gan et al., 2014; Apfel et al. 1999). However, nausea risk scores were similar between groups, as assessed using the Apfel Risk Score (Apfel & Roewer, 2004), This is to say that both groups had comparable baseline risk.

More metoclopramide patients had a motion sickness history. The researcher believes that this could have affected the results, as motion sickness is a predictor of nausea after surgery (Gan, 2006). Other patient characteristics were similar between groups, including age, BMI, smoking status, and type of surgery. This makes the drug comparison more reliable. However, patients were not randomly assigned to groups, which can create imbalances, such as the motion sickness difference the researcher observed.

Multiple studies have shown that dexamethasone prevents nausea by blocking prostaglandin production and reducing serotonin release in the gut (De Oliveira Jr et al. 2013; Henzi et al. 2000; Suzuki et al. 2004). Metoclopramide works differently, as it stimulates the stomach to empty and blocks dopamine receptors in the brain (Golembiewski et al., 2005). Wallenborn et al. (2006) found that dexamethasone was more effective than metoclopramide, but other studies have found them to be equally effective (Aziz et al., 2011).

The results of this study add more knowledge to the literature by comparing these two drugs in patients undergoing laparoscopic surgery. Laparoscopic procedures already increase the risk due to CO_2 gas and organ manipulation (Grabowski & Talamini, 2009). Therefore, choosing the right preventive medication is crucial in these contexts. Most patient characteristics were similar between groups, which makes the comparison reliable. However, more metoclopramide patients had a history of motion sickness. Thus, it is necessary to interpret the results carefully, and future studies should balance high-risk patients equally between groups from the outset.

Surgical Variables

Several surgical factors differed between groups and could have affected nausea outcomes. Metoclopramide patients were taller on average (167.53 cm vs. 157.29 cm; $p = 0.013$). Height is not usually linked to nausea, but it might affect how drugs spread through the body or how patients breathe during laparoscopic surgery (Perilli et al., 2000). The metoclopramide group also had higher CO_2 levels (35.8 vs. 34.47 mmHg; $p = 0.005$), which suggests different ventilation settings or CO_2 absorption during surgery.

Despite the statistically significant difference, both readings remained within the normal physiological range for CO_2; hence, the change is deemed clinically insignificant. Increased CO_2 levels have been linked to a heightened incidence of postoperative nausea and vomiting (PONV) due to visceral distension and acidosis (Venkatraman et al., 2023) potentially serving as a confounding variable in assessing the antiemetic efficacy between the two groups.

The duration of surgery was significantly shorter in the metoclopramide group (70.11 min vs. 81.44 min; *p* = 0.002). Prolonged surgery is a known PONV risk factor (Apfel et al., 1999), as it correlates with increased anesthetic exposure and visceral manipulation. This discrepancy may bias outcomes, as dexamethasone's longer surgical duration could artificially elevate its PONV incidence. However, other intraoperative variables—including total fentanyl (141.11 µg vs. 153.33 µg; *p* = 0.338), propofol doses (167.78 mg vs. 161.33 mg; *p* = 0.554), and fluid intake (1368.89 mL vs. 1371.11 mL; *p* = 0.965)—were comparable, mitigating concerns about anesthetic heterogeneity. The standardized sevoflurane concentration (1.2%) and FiO_2 (50%) further support procedural consistency.

The observed differences in end-tidal CO_2 align with evidence linking hypercapnia to PONV via serotonin release in the gut (Gershon, 2013) Dexamethasone's anti-inflammatory properties may counteract this mechanism more effectively than metoclopramide's dopaminergic action (Suzuki et al., 2004). However, the shorter surgery duration in the metoclopramide group complicates direct efficacy comparisons, as prolonged procedures independently increase PONV risk (Gan et al., 2014). Prior studies have reported mixed results: (Wallenborn et al., 2006)) found dexamethasone superior, while (Aziz et al., 2011) noted equivalent outcomes. The current study's surgical duration disparity underscores the need for stratified randomization in future trials to control for time-dependent confounders.

Postoperative Monitoring

The comparative analysis of postoperative outcomes between metoclopramide and dexamethasone groups revealed significant differences in both PACU and ward settings, with dexamethasone demonstrating superior efficacy in several key measures. In the PACU, patients receiving metoclopramide reported higher nausea intensity (mean = 1.82 vs. 1.07; *p* = 0.005) and required more rescue antiemetics (44.4% vs. 15.6%; *p* = 0.003), corroborating prior findings that dexamethasone's anti-inflammatory properties provide more sustained PONV prophylaxis (Henzi et al., 2000), (Sekhavat et al., 2015). Notably, metoclopramide was associated with a higher incidence of adverse effects, including headache (73.3% vs. 42.2%; *p* = 0.003), fatigue (77.8% vs. 46.7%; *p* = 0.002), blurred vision (33.3% vs. 8.9%; *p* = 0.004), and tremor (35.6% vs. 0%; *p* < 0.001). These results are similar to previous work regarding the side effects of metoclopramide. Previous work concluded that it can cause movement problems by affecting dopamine receptors (Golembiewski et al., 2005), (Huerta-Franco et al., 2009). Dexamethasone's longer-lasting effects on serotonin and prostaglandin may better control early symptoms after surgery (Suzuki et al., 2004) Both groups had similar vomiting rates in the ward (15.6% vs. 8.9%; p = 0.334), which differs from the rates observed in PACU. This might be because vomiting was lower (12.2%) and dexamethasone reaches peak effectiveness later (Wang et al., 2000).

Incidence of Nausea (Arrival-24th Hours)

The incidence of nausea was lower in the dexamethasone group compared to the metoclopramide group, both on arrival (60.0% vs. 84.4%, p=0.010) and over the total 24-hour period (66.7% vs. 84.4%, p=0.048). This shows that dexamethasone was more effective in preventing nausea episodes. This superior result can be explained by dexamethasone's multiple mechanisms of action, which include reducing central nausea pathways and providing anti-inflammatory effects, leading to longer-lasting prevention (De Oliveira Jr et al., 2013; Apfel et al., 2004). In contrast, metoclopramide's restricted dopaminergic mechanism and shorter half-life likely contribute to its higher incidence in this group (Gan et al., 2014).

Intensity of Nausea (Arrival-24th Hours)

The notice rising nausea intensity in the metoclopramide group contrast to dexamethasone—both on arrival (mean ± SD: 1.78 ± 1.02 vs. 1.29 ± 1.04 :p=0.006) and the 24-hour period in the ward (0.68 ± 0.48 vs. 0.51 ± 0.55: p=0.010) might be refer to differences in their mechanisms of action and duration of effect.

Metoclopramide mainly works as a dopamine D2 receptor antagonist and has a comparatively short half-life, which may limit its sustained efficacy against postoperative nausea and vomiting (Gan et al., 2014) . In contrast, dexamethasone acts as an antiemetic via multiple central and peripheral pathways, exhibiting anti-inflammatory action and inhibiting prostaglandin synthesis, which offers prolonged relief (De Oliveira Jr et al., 2013).

The lower intensity of nausea with dexamethasone supports the notion that corticosteroids provide more effective and longer-lasting control of nausea symptoms than the mechanism-based agents, such as metoclopramide (Apfel & Roewer, 2004).

Rescue Medication (Arrival-24th Hours)

In the early postoperative period (PACU), a larger part of patients in the metoclopramide group need rescue antiemetics (44.4%) compared to only 15.6% in the dexamethasone group with p=0.003 . This may reflect metoclopramide's shorter duration of action, which prepares for quick rest, but its effects disappear relatively soon (Gan et al., 2014). On the

contrary, dexamethasones delayed onset but longer-lasting effect may decrease the need for early intervention in the PACU (Apfel & Roewer, 2004).

Nevertheless, the ward remains over 24 hours. The type of reversal was different: 33.3% of dexamethasone patients required rescue antiemetics, compared to only 6.7% in the metoclopramide group with p=0.002, and the total number of rescue episodes was also higher (8.3% vs. 1.7% : p=0.005). This suggests that dexamethasone's initial benefit may not have lasted for some patients, while the metoclopramide group required fewer later interventions, even though most had already received rescue medication in PACU. These results show the importance of timing and drug action duration in choosing anti-nausea medications (De Oliveira Jr et al., 2013).

Incidence of Headache

The data showed differences between the two treatment groups, but these differences were not statistically significant at any measured time point: arrival, 6th hour, 12th hour, and 24th hour, with all p-values above 0.05. Both groups showed an incidence rate of headache of 77.8% on arrival, which did not change through the observation period (see Table 8). These findings imply that metoclopramide and dexamethasone did not differ in reducing postoperative headache, which is consistent with findings from previous studies that have revealed a very limited antiemetic effect on headache-specific outcomes (Gan et al., 2014; Henzi et al., 2000).

The lack of a considerable divergence between the two interventions has been attributed to different mechanisms of action. Metoclopramide, a dopamine antagonist, acts mainly against nausea and vomiting by facilitating gastric emptying and blocking central D2 receptors (Gershon, 2013; De Oliveira Jr et al., 2012). As opposed to dexamethasone, a glucocorticoid, which has an anti-inflammatory and antiemetic action by inhibiting prostaglandin synthesis and modulating serotonin release in the bowel. (Holte & Kehlet, 2002), (De Oliveira et al., 2011) While the two drugs have been proven for use in PONV prophylaxis, their effect on headache seems to be insignificant, probably because postoperative headaches have a different causation mechanism (dehydration, change in intracranial pressure, or anesthetic effect remnants) (Apfel et al., 2012; Uribe et al., 2021). Headache incidence turned out to be decreased in a remarkable fashion 6 hours after drug administration, yet the difference was not significant in statistical terms

(28.9% for metoclopramide vs. 13.3% for dexamethasone, p = 0.071). This trend has been delineated by (Wallenborn et al., 2006), who stated that dexamethasone, with its delayed anti-inflammatory action, could possibly handle PONV in its late-onset phase but less so the immediate postoperative symptoms. Likewise, our findings presented almost no headache incidence at 12 and 24 hours (≤ 2.2% in both groups), thus corroborating that postoperative headaches are transient in most patients (Ku & Ong, 2003). The authors concluded that dexamethasone showed moderate efficacy in reducing headache recurrence when delivered in the department as an addition to routine headache treatment.

Incidence of Fatigue

Statistically, differences between the two treatment groups were not significant at any measured interval (arrival, 6^{th}, 12^{th}, and 24^{th} hours), p-values being all greater than 0.05 (as shown in Table 9). At arrival, events of fatigue were almost parallel between groups of metoclopramide 88.9% and dexamethasone 84.4%, with no significant differences noted with time. Thus, the findings tend to indicate that neither drug has a better effect on alleviating postoperative fatigue, which is in agreement with another research that postulated antiemetics might not really have much to do with fatigue-related postoperative recovery (Apfel et al., 2012; Holte & Kehlet, 2002).

Fatigue is a multifactorial postoperative symptom influenced by surgical stress, anesthesia, and inflammatory responses (Ippolito et al., 2024). Thus, dexamethasone, a glucocorticoid, may blur the onset of fatigue by virtue of its anti-inflammatory effects and, in doing so, compromise realization of stress responses to surgery (De Oliveira et al., 2011). However, our findings suggested that no particular benefit could be attributed to dexamethasone when compared with metoclopramide, a dopamine antagonist administered almost exclusively for the prevention of nausea and vomiting (Gershon, 2013).

This lack of difference may arise because fatigue is not as directly mediated by the dopaminergic or anti-inflammatory pathways targeted by these agents, but rather is more closely related to metabolic exhaustion and ways in which energy is disrupted by sleep (Glenn S. Murphy et al., 2011).

Fatigue incidence was noted to have dropped sharply by the 6^{th} postoperative hour (22.2% for metoclopramide versus 24.4% for dexamethasone; p = 0.803), and few incidences

were recorded after that (≤ 2.2% for 12th- and 24th-hour intervals). Most patients experienced post-surgical fatigue, which typically disappeared within 6 hours, regardless of the medication they received. This matches findings from other studies where postoperative fatigue peaks immediately after surgery and quickly decreases over time (Holte & Kehlet, 2002). The absence of significant differences further suggests that fatigue is determined more by what kind of surgery one undergoes (e.g., duration, invasiveness) than the choice of antiemetic (Apfel & Roewer, 2004). More investigation is needed to investigate mitigation techniques and alternative dosing strategies to reduce risks.

Dizziness Incidence Patterns

Based on the results of the study, there were no statistically significant differences in dizziness rates between the metoclopramide and dexamethasone groups for any time interval (Table 10). The highest incidence of dizziness was on arrival (68.9% metoclopramide vs. 53.3% dexamethasone, p = 0.130), and then it dropped quickly to 8.9% and 17.8% at 6 hours, respectively. Such a temporal trend suggests that postoperative dizziness is mostly an early event, likely stemming from residual anesthetic effects rather than being affected by the antiemetic that is administered. Apfel et al. (2012), because there was a lack of significance between the groups, it further suggests that neither of the drugs can be said to work against one of the most common postoperative complaints. That said, the consistently higher frequency of complaints in the metoclopramide group may warrant investigation in larger cohorts. The estimated risk for dizziness evaluated in treatment guidelines due to metoclopramide is quite high. This risk should be considered alongside known risk factors when prescribing metoclopramide treatment.

Significant Findings in Blurred Vision

The analysis of blurred vision (see Table E.1 in Appendix E) shows a notable finding: the incidence at arrival was significantly higher in the metoclopramide group (13.3% vs. 0%, p=0.026). This aligns with the known cholinergic effects of metoclopramide, which can disrupt visual accommodation (Sekeroglu et al., 2016). The absence of this symptom in the dexamethasone group may make this drug preferable for patients who need clear vision immediately after surgery. However, by the 6th hour, this difference was no longer

significant. This is to say that the effect was temporary. Overall rates over 24 hours did not differ significantly (13.3% vs. 6.7%, p = 0.485), which questions the clinical importance of this early difference. Metoclopramide can cause acute dystonic reactions, including eye movement disorders, which are rare but serious side effects in young patients. These symptoms can look similar to other neurological conditions, such as eye movement tics. Therefore, medical teams should watch for this side effect to avoid unnecessary neurological testing.

Tremor as a Distinct Adverse Effect

Differing outcomes are emerging more so than mild tremors (Table E.2 in Appendix E). Metoclopramide-diagnosed patients suffer from a significantly higher incidence upon arrival (22.2% vs. 0%, p = 0.001), higher total tremor incidence (22.2% vs. 2.2%, p = 0.004), and higher overall tremor counts (5.6% vs. 0.6%, p = 0.007). The findings strongly suggest tremor as a very specific adverse effect of metoclopramide, probably mediated through its dopaminergic action in the basal ganglia (Gershon, 2013). Tremor was nearly absent with dexamethasone and hence would be preferred for the patient in whom tremor could compromise recovery or who is at a special risk for movement-related complications. Tremors were quite frequently reported in the literature and may therefore be recognized. Prospective collection of complete case data is, however, warranted to better establish predisposing factors, semiology, and best management or prevention.

Incidence and Intensity of Nausea in the Ward (Arrival-6 Hours)

The results demonstrated a significantly higher incidence of nausea upon arrival in the metoclopramide group (84.4%) compared to the dexamethasone group 60% (*p* = 0.010). This aligns with previous research suggesting that dexamethasone has a more sustained antiemetic effect due to its prolonged glucocorticoid-mediated suppression of inflammatory pathways (Gan et al., 2014; Apfel et al., 2012). Patients receiving dexamethasone had lower nausea intensity upon arrival compared to those receiving metoclopramide (1.16 vs. 1.78, p = 0.006). This is to say that dexamethasone's anti-inflammatory effects can control nausea early after surgery (De Oliveira et al., 2011; Henzi et al., 2000). It is worth noting that both drugs were effective at 2, 4, and 6 hours. Similar effectiveness is observed once patients are further along in recovery.

Rescue Antiemetic Use in the Ward (Arrival-6 Hours)

Many dexamethasone patients required rescue antiemetics compared to metoclopramide patients (33.3% vs 6.7%, p = 0.002). This finding differed from the results of previous studies. Previous work found that dexamethasone reduced rescue medication needs (Wang et al., 2000; Alkaissi et al., 2017). The early use of rescue in the metoclopramide group in the PACU contributed to the use of fewer rescue antiemetics in this group. Additionally, the pharmacokinetics of both metoclopramide and dexamethasone influence the duration and onset of action. Dexamethasone needs more time to show the results. Thus, patients may require additional antiemetics after surgery. However, metoclopramide's results were quick in patients ((Kovac, 2013; Golembiewski et al., 2005). By 6 hours, even more dexamethasone patients needed rescue medications (p = 0.006), suggesting the single dose was losing its effectiveness. Combining both drugs might work better (Glenn S Murphy et al., 2011; Habib & Gan, 2004).

Postoperative Pain and Patient Satisfaction

Pain scores were higher in the metoclopramide group at 2 and 4 hours after surgery (p = 0.048 and p = 0.039). This reflects dexamethasone's pain-relieving effects, which have been demonstrated in several meta-analyses (De Oliveira et al., 2011; Holte & Kehlet, 2002). Patients also reported higher satisfaction with dexamethasone (p = 0.049). The researcher believes that this is due to the fact that they had less nausea and pain. Other studies confirm that steroids, such as dexamethasone, improve recovery by reducing inflammation (Glenn S. Murphy et al., 2011).

4.2 Conclusion

Dexamethasone has been shown to have greater efficacy and tolerability than Metoclopramide in preventing postoperative nausea and vomiting. It markedly reduced the severity of nausea, the frequency of adverse effects (such as headaches, fatigue, impaired vision, and tremors), and improved patient satisfaction. Dexamethasone markedly reduced the need for rescue antiemetic medications in the PACU. These findings confirm the preferential application of Dexamethasone as an efficacious antiemetic approach in patients undergoing elective surgery.

Future research with larger samples could further investigate the long-term effects of these medications, including any potential impacts on blood glucose levels and overall postoperative recovery.

4.3 Recommendations

1. To overcome these constraints and build upon existing research, numerous strategic proposals emerge. Future studies should utilize risk-stratified randomization with proven PONV factors (motion sickness history, female sex, non-smoking status, and postoperative painkiller usage) to ensure balanced group allocation.
2. Standardization of surgical parameters is crucial, especially for CO_2 insufflation pressures (12-15 mmHg), breathing techniques to preserve normocapnia, and operating length matching. Such controls would help to separate the pharmacological effects of study drugs.
3. The observed superiority of dexamethasone supports its preferential use as first-line prophylaxis; however, combination regimens with 5-HT3 antagonists are worth investigating, given the multimodal character of PONV pathogenesis. Alternative medicines such as ondansetron may have better safety profiles than metoclopramide for steroid-contraindicated individuals.
4. Longitudinal studies with longer follow-up periods (72-96 hours) would provide important data on late outcomes, whereas multicenter designs would enhance generalizability. Future studies should incorporate patient-centered indicators, such as quality of recovery scores and functional outcomes, to gain a comprehensive understanding of the therapeutic impact of antiemetic selection.
5. Routine preoperative PONV risk assessment using proven techniques would enable more tailored prophylactic strategies in clinical practice, potentially improving outcomes through targeted interventions.

4.4 Limitation

1. Bas eline Characteristics Imbalance: This study found a considerable imbalance in baseline characteristics across treatment groups, particularly in terms of motion sickness prevalence (Metoclopramide: 26.7% vs. Dexamethasone: 8.9%: p=0.027). Because motion sickness is a major component of the Apfel risk rating system for

PONV, this difference may have significantly influenced the observed results. This restriction highlights the importance of using risk-stratified randomization techniques in future antiemetic studies to ensure comparable study groups.

2. Surgical Variables Variation: Important surgical factors differed between the groups and could have influenced the outcomes. The Metoclopramide group had higher CO_2 levels (35.8 vs 34.47 mmHg: p=0.005) and shorter surgery times (70.11 vs 81.44 minutes: p=0.002). Higher CO_2 levels can irritate the diaphragm and cause nausea, while different surgery lengths result in varying anesthetic exposure. Future studies need better control of these surgical variables.
3. Uncontrolled Confounding Factors: The study did not control for postoperative opioids, which commonly cause nausea and could affect how often patients needed rescue antiemetics.
4. ccFollow-up Duration Constraints: The 24-hour monitoring period may have missed late-onset side effects or symptoms that appeared after patients were discharged from the hospital. Longer follow-up would show how long the antiemetic effects last and catch any delayed problems from either drug.
5. The study's single-center design: This single-centre study with a small sample size limits how widely these findings can be applied to other hospitals and patient groups. Different hospitals use different anaesthetic protocols and treat different patient populations, which may affect the results.

4.5 Strengths of the Study

1. Focused Participant Selection: The study included adult patients aged 18 to 65 years with ASA physical status I or II undergoing laparoscopic surgery. This careful selection minimised confounding variables related to comorbidities or advanced age.
2. Homogeneity of the Sample: By limiting the study to patients within a specific age range, ASA classification, and one type of surgery (laparoscopic), the sample was relatively homogeneous. This reduced variability and allowed clearer comparisons between treatment groups and a better ability to link observed outcomes directly to the treatments.
3. Clinical Relevance: The focus on laparoscopic surgeries is highly relevant since PONV is common in these procedures. The results can be directly applied in clinical

practice. It can help anesthesiologists and surgical teams choose effective preventive anti-nausea treatments.

4. Efficient Use of Resources: The study used purposive sampling to select participants who met the specific criteria. This approach ensured the research focused on the most relevant patient population. It saves time and resources without compromising the study objectives.
5. Foundation for Future Research: The study provides a solid foundation for future research comparing different anti-nausea treatments in laparoscopic surgery. The research design, patient selection, and clinical focus create a valuable reference for future research. Future multicenter trials or larger randomized studies can build on these findings and test them in broader populations.

List of Abbreviations

Abbreviation	Meaning
PONV	Postoperative Nausea and Vomiting
CTZ	Chemoreceptor Trigger Zone
RCT	Randomized Controlled Trial
ASA	American Society of Anesthesiologists
BMI	Body Mass Index
IV	Intravenous
IP	Intraperitoneal
CNS	Central Nervous System
VC	vomiting center
GI	Gastrointestinal
NSAID	Non-steroidal Anti-Inflammatory Drug
PACU	Post-Anesthesia Care Unit
POP	Postoperative Pain
IPPV	Intermittent Positive Pressure Ventilation
SPSS	Statistical Package for the Social Sciences
VAS	Visual Analog Scale
WHO	World Health Organization
GABA	Gamma-Aminobutyric Acid
5-HT3	5-Hydroxytryptamine (Serotonin) Type 3
5-HT4	Stimulating5-Hydroxytryptamine Receptor 4
D2	Dopamine D2 Receptor
H1	Histamine H1 Receptor
NK1	Neurokinin-1 receptors
GDPR	General Data Protection Regulation
CRH	Corticotropin-releasing hormone
HPA	Hypothalamic-Pituitary-Adrenal (axis)
MAC	Minimum Alveolar Concentration
ANOVA	Analysis of Variance
CONSORT	Consolidated Standards of Reporting Trials
Cm	Centimeter (s)
Hrs	Hours
Kg	Kilogram(s)
Min	Minute
Ml	Milliliter (s)
Mg	Microgram (s)
Mm	Millimeter (s)
CO2	Carbon Dioxide
NNT	Number Needed to Treat
Nacl	Normal Saline
GERD	Gastroesophageal Reflux Disease
SD	Standard Deviations
CINV	Chemotherapy-Induced Nausea and vomiting
SpO_2	Oxygen Saturation

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Appendices

Appendix A

Consent form

جامعة النجاح الوطنية

كلية الدراسات العليا

موافقة للاشتراك في البحث العلمي:

انا طالبة من كلية الدراسات العليا من جامعة النجاح الوطنية تحت إشراف الدكتورة عائده القيسي نود اخذ الموافقة منك لمشاركتك في بحث علمي سريري سيجرى في مستشفى رفيديا الجراحي في نابلس . الرجاء أن تأخذوا الوقت الكافي لقراءة المعلومات التالية بتأن قبل أن تقرروا إذا كنتم تريدون المشاركة في الدراسة أم لا . بإمكانكم طلب إيضاحات أو معلومات إضافية عن أي شيء مذكور في هذه الاستمارة أو عن هذه الدراسة من الباحث.

عنوان الدراسة:

تقييم فعالية العلاج المشترك بالأوندانسيترون والدكساميثازون مقارنةً بالعلاج الفردي في الوقاية من الغثيان والقيء بعد الجراحة بالمنظار: تجربة سريرية مزدوجة التعمية.

الهدف من الدراسة:

تهدف هذه الدراسة إلى تقييم فعالية العلاج المشترك بالأوندانسيترون والدكساميثازون مقارنةً بالعلاج الفردي لكل منهما في الوقاية من الغثيان والقيء بعد العمليات الجراحية بالمنظار. كما تهدف الدراسة إلى مقارنة معدلات حدوث الغثيان والقيء بعد الجراحة، الحاجة إلى مضادات القيء الطارئة، ودرجة رضا المرضى، والآثار الجانبية المرتبطة بهذه العلاجات.

فترة المشاركة في الدراسة:

تبدأ مشاركتك في الدراسة قبل بدء العملية الجراحية المخطط لها بـ 30 دقيقة، حيث سيتم التحضير والإشراف على حالتك الصحية. بعد ذلك، ستتم مراقبة حالتك الصحية على مدار 24 ساعة بعد العملية، بما في ذلك قياس المؤشرات الصحية وتقييم حالة الغثيان والقيء، وتسجيل أي مضاعفات أو آثار جانبية.

إجراء الدراسة:

في هذه الدراسة، سيتم إشراك المرضى في تجربة سريرية مزدوجة التعمية لتقييم فعالية العلاجات المختلفة في الوقاية من الغثيان والقيء بعد الجراحة. سيتم توزيع المرضى عشوائيًا إلى ثلاث مجموعات علاجية: مجموعة الأوندانسيترون، مجموعة الدكساميثازون، ومجموعة الأوندانسيترون والدكساميثازون المشتركة. سيُعطى كل مريض العلاج المخصص لمجموعته بعد التخدير.

بعد الجراحة، سيتم نقل المرضى إلى وحدة العناية بعد التخدير (PACU) ، حيث سيتم مراقبة حالتهم الصحية بشكل دقيق، بما في ذلك قياس درجة الحرارة، النبض، والتنفس، وتقييم الغثيان والقيء. سيتم تسجيل أي مضاعفات أو آثار جانبية قد تحدث. تستمر المتابعة والتقييم لمدة 24 ساعة بعد الجراحة لضمان تقديم الرعاية المناسبة وتحليل فعالية العلاجات.

الفوائد المتوقعة للمشاركة في الدراسة:

تخفيف المضاعفات المحتمل حدوثها بعد العملية (الغثيان والتقيؤ)

التأثيرات السلبية للمشاركة في الدراسة:

التأثيرات المتوقعة هي من الأعراض الجانبية للأدوية ، لذلك الأدوية سوف تعطى في جرعات خفيفة ولمرة واحدة فقط مما يقلل من الأعراض الجانبية لها ، وفي حال حدوث هذه الأعراض سيتم تقديم العلاج المناسب لها بغض النظر في أي مجموعة انت.

سرية المعلومات:

لحماية خصوصيتك ، سوف يتم تسجيل النتائج مع رمز سري . سوف يتم تسجيل فقط اسمك في نموذج الموافقة وسيتم الإبقاء على رمز السري المعين في ملف مغلق ومحمي بعناية وسيكون الوصول لهذه المعلومات يتم فقط من قبل الباحث الرئيسي للدراسة والأفراد المرخص لهم . مع ذلك، قد تتم مراجعة سجلات الدراسة من قبل اللجنة الأخلاقية التي تجري على البشر في جامعة النجاح الوطنية. ستتم مراقبة السجلات الخاصة بك ويمكن مراجعتها دون انتهاك السرية وأية بيانات يمكن أن تنتج عن هذه الدراسة لن تذكر أسماء المشاركين في الدراسة.

المشاركة الطوعية/ الانسحاب:

إن مشاركتك في هذه الدراسة طوعية تماما، يمكنك سحب موافقتك في أي وقت . وإذا اخترت عدم مشاركة في الدراسة أو الانسحاب في وقت لاحق من هذه الدراسة لن تتأثر الرعاية الطبية المقدمة لك أو تتغير بأي شكل من الأشكال. إذا كنت ترغب بالانسحاب من الدراسة، يمكنك الاتصال بالباحث.

الاتصال للحصول على أجوبة على أسئلتك ومخاوفك وشكوك:

إذا كان لديكم أي أسئلة، مخاوف أو شكاوى، يرجى الاتصال بالباحث للدراسة على الرقم المدرج أسفل الصفحة من هذه الموافقة.

الموافقة على المشاركة في الدراسة:

لقد قرأنا الوصف أعلاه من هذه الدراسة وقد تمت الإجابة على جميع أسئلتنا . ونحن نعلم بإمكاننا أن نرفض مشاركة أو الانسحاب من الدراسة في أي وقت وعلى ذلك نعطي موافقة بحرية للمشاركة في هذه الدراسة.

الباحث : رغد عبد اللطيف عوض عطيه

0593963660 رقم الهاتف:

اسم المشارك في البحث:

التوقيع:

التاريخ:

Appendix B

Collecting Data Sheet

Demographic data

Demographic Data

Variable	
Name	
Age (year)	
Type of surgery	
History of PONV in previous operation (Yes/No)	
History of motion sickness (Yes/No)	
Planning for Opioid use postoperatively (Yes/No)	
Smoking (Yes/No)	
Apfel simplified risk score for PONV (%) 1 factor: 20% 2 factor:40% 3 factor: 60% 4 factor: 80%	
Weight (kg)	
Height (Cm)	
BMI	

Surgical Variables

Variable	
Total fentanyl (µg)	
Total propofol (mg)	
End-tidal sevoflurane concentration (%)	
End-tidal CO2 (mmHg)	
Duration of surgery (min)	
Duration of anesthesia (min)	
Intraoperative fluid intake (ml)	
Intraoperative FIO2 (%)	

Intraoperative Monitoring

Variable	15 min	30 min	45 min	60 min	75 min	90 min	105 min	120 min
Systolic BP								
Diastolic BP								
MAP								
Respiratory rate								
SPO2								

Postoperative Monitoring

In PACU

Variable	On Arrival
Systolic BP	
Diastolic BP	
MAP	
Respiratory rate	
SPO2	
Incidence of nausea (Yes/No)	
Intensity of nausea (0-6)	
Incidence of vomiting (Yes/No)	
Antiemetic rescue medication (Yes/No)	
Incidence of headache (Yes/No)	
Incidence of fatigue (Yes/No)	
Incidence of dizziness (Yes/No)	
Incidence of blurred vision (Yes/No)	

In the Ward

Variable	On Arrival	6^{th} Hour	12^{th} Hour	24^{th} Hour
Systolic BP				
Diastolic BP				
MAP				
Respiratory rate				
SPO2				
Incidence of nausea (Yes/No)				
Intensity of nausea (0-6)				
Incidence of vomiting (Yes/No)				
Antiemetic rescue medication (Yes/No)				
Incidence of headache (Yes/No)				
Incidence of fatigue (Yes/No)				
Incidence of dizziness (Yes/No)				
Incidence of blurred vision (Yes/No)				

Time Interval	Incidence	Severity (0-6)	Rescue	Pain (0-10)	Side Effects	Satisfaction (VAS) scal
On Arrival	Nausea: Yes/No		Antiemetics: Yes/No			
2 Hours	Nausea: Yes/No		Antiemetics: Yes/No			
4 Hours	Nausea: Yes/No		Antiemetics: Yes/No			
6 Hours	Nausea: Yes/No		Antiemetics: Yes/No			

Appendix C

IRB form

An-Najah National
University
Faculty of Medicine &
Health Sciences
Institutional Review Board

جامعة النجاح الوطنية
كلية الطب وعلوم الصحة
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Ref: Mas. Oct. 2024/9

IRB Approval Letter

Title of Research:
Efficacy of prophylactic antiemetic in patients undergoing Laparoscopic Surgeries: A descriptive study

Submitted by:
Raghad Abd Alltife Awad Atieh

Supervisor:
Aidah Alkaissi

Approved:
13th October. 2024

Your Study Title "***Efficacy of prophylactic antiemetic in patients undergoing Laparoscopic Surgeries: A descriptive study.***" Reviewed by An-Najah National University IRB committee and was approved on 13th October 2024.

Hasan Fitian, MD

IRB Committee Chairman

IRB
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Appendix D

Certificate of English Proofreading and Editing

Certificate of English Proofreading and Editing

This certificate confirms that the thesis mentioned below was proofread by a copy editor and edited by a native speaker.

The following issues were corrected: grammar, punctuation, sentence structure, and phrasing.

Faculty of Graduate Studies at An-Najah National University may contact us for a copy of the edited document that the author submitted.

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Appendix E

Tables

Table E.1

Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the incidence of dizziness in the ward (N=90)

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Incidence of Dizziness on Arrival	31(68.9%)	24(53.3%)	55(61.1%)	0.130
Incidence of Dizziness at 6th Hour	4(8.9%)	8(17.8%)	12(13.3%)	0.215
Incidence of Dizziness at 12th Hour	1(2.2%)	0(0%)	1(1.1%)	0.315
Incidence of Dizziness at 24th Hour	1(2.2%)	0(0%)	1(1.1%)	0.315
Total Incidence of Dizziness in the Ward (Arrival-24th Hours)	31(68.9%)	24(53.3%)	55(61.1%)	0.130
Total Number of Times of Incidence of Dizziness in the Ward (Arrival-24th Hours)	37/180(20.6%)	32/180(17.8%)	69/360(19.2%)	0.547

Table E.2

Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the incidence of blurred vision in the ward (N=90)

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Incidence of Blurred Vision on Arrival	6(13.3%)	0(0%)	6(6.7%)	0.026
Incidence of Blurred Vision at 6^{th}	0(0%)	3(6.7%)	3(3.3%)	0.242
Incidence of Blurred Vision at 12^{th}	0(0%)	0(0%)	0(0%)	----
Incidence of Blurred Vision at 24^{th}	0(0%)	0(0%)	0(0%)	----
Total Incidence of Blurred Vision in the Ward (Arrival-24th Hours)	6(13.3%)	3(6.7%)	9(10%)	0.485
Total Number of Times of Incidence of Blurred Vision in the Ward (Arrival-24th Hours)	6/180(3.3%)	3/180(1.7%)	9/360(2.5%)	0.317

Table E.3

Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the incidence of tremor in the ward (N=90)

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Incidence of tremor on Arrival	10(22.2%)	0(0%)	10(11.1%)	0.001
Incidence of tremor at 6th	0(0%)	0(0%)	0(0%)	----
Incidence of tremor at 12th	0(0%)	1(2.2%)	1(1.1%)	0.315
Incidence of tremor at 24th	0(0%)	0(0%)	0(0%)	----
Total Incidence of tremor in the Ward (Arrival-24th Hours)	10(22.2%)	1(2.2%)	11(12.2%)	0.004
Total Number of Times of Incidence of tremor in the Ward (Arrival-24th Hours)	10/180(5.6%)	1/180(0.6%)	11/360(3.1%)	0.007

Table E.4

Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the incidence of nausea in the ward (N=90)

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Incidence of Nausea on Arrival	38(84.4%)	27(60%)	65(72.2%)	0.010
Incidence of Nausea at 2 Hours	32(71.1%)	27(60%)	59(65.6%)	0.267
Incidence of Nausea at 4 Hours	15(33.3%)	17(37.8%)	32(35.6%)	0.660
Incidence of Nausea at 6 Hours	15(33.3%)	15(33.3%)	30(33.3%)	1.000
Total Incidence of Nausea (Arrival-6 Hours)	38(84.4%)	30(66.7%)	68(75.6%)	0.050
Total Number of Times of Incidence of Nausea (Arrival-6 Hours)	100/180(55.6%)	86/180(47.8%)	186/360(51.7%)	0.305

Table E.5

Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the intensity of nausea in the ward (N=90)

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Intensity of Nausea on Arrival	1.78 ± 1.02	1.16 ± 1.07	1.47 ± 1.08	0.006
Intensity of Nausea at 2 Hours	1.2 ± 0.94	0.91 ± 0.85	1.06 ± 0.9	0.130
Intensity of Nausea at 4 Hours	0.6 ± 0.89	0.53 ± 0.76	0.57 ± 0.82	0.703
Intensity of Nausea at 6 Hours	0.56 ± 0.84	0.62 ± 1.11	0.59 ± 0.98	0.749
Total Intensity of Nausea (Arrival-6 Hours)	1.03 ± 0.83	0.81 ± 0.82	0.92 ± 0.83	0.194

Table E.6

Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the Antiemetics in the ward (N=90)

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Antiemetics on Arrival	3(6.7%)	7(15.6%)	10(11.1%)	0.180
Antiemetics at 2 Hours	0(0%)	0(0%)	0(0%)	----
Antiemetics at 4 Hours	0(0%)	0(0%)	0(0%)	----
Antiemetics at 6 Hours	0(0%)	8(17.8%)	8(8.9%)	0.006
Total Antiemetics (Arrival-6 Hours)	3(6.7%)	15(33.3%)	18(20%)	0.002
Total Number of Times of Antiemetics (Arrival-6 Hours)	3/180(1.7%)	15/180(8.3%)	18/360(5%)	0.005

Table E.7

*Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the pain(N=90)**

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Pain on Arrival	3.18 ± 0.53	2.91 ± 0.85	3.04 ± 0.72	0.078
Pain at 2 Hours	3.07 ± 0.58	2.82 ± 0.58	2.94 ± 0.59	0.048
Pain at 4 Hours	2.42 ± 0.58	2.11 ± 0.8	2.27 ± 0.72	0.039
Pain at 6 Hours	1.67 ± 0.64	1.53 ± 1.14	1.6 ± 0.92	0.496
Total Pain (Arrival-6 Hours)	2.58 ± 0.46	2.34 ± 0.69	2.46 ± 0.59	0.056

* Pain is a scale (0-10).

Table E.8

Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the side effects (N=90)

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Side Effects on Arrival	0(0%)	0(0%)	0(0%)	----
Side Effects at 2 Hours	0(0%)	0(0%)	0(0%)	----
Side Effects at 4 Hours	0(0%)	0(0%)	0(0%)	----
Side Effects at 6 Hours	0(0%)	0(0%)	0(0%)	----
Total Side Effects (Arrival-6 Hour)	0(0%)	0(0%)	0(0%)	----
Total Number of Times of Side Effects (Arrival-6 Hours)	0/180(0%)	0/180(0%)	0/360(0%)	----

Table E.9

Comparisons between Metoclopramide drug and Dexamethasone drug in regards of the satisfaction (N=90)

Variable	Drug Group		Total (N=90)	P-value
	Metoclopramide (N=45)	Dexamethasone (N=45)		
Satisfaction on Arrival (VAS Scale)	2.78 ± 0.42	2.96 ± 0.42	2.87 ± 0.43	0.049
Satisfaction at 2 Hours (VAS Scale)	3.16 ± 0.56	3.33 ± 0.64	3.24 ± 0.61	0.165
Satisfaction at 4 Hours (VAS Scale)	4.16 ± 0.74	4.47 ± 0.99	4.31 ± 0.88	0.095
Satisfaction at 6 Hours (VAS Scale)	5.16 ± 0.82	5.11 ± 2.04	5.13 ± 1.54	0.892
Total Satisfaction (Arrival-6 Hours)	3.81 ± 0.47	3.97 ± 0.8	3.89 ± 0.66	0.265

Appendix F

Figures

Figure F.1

Incidence of Blurred Vision (Arrival-24th Hours)

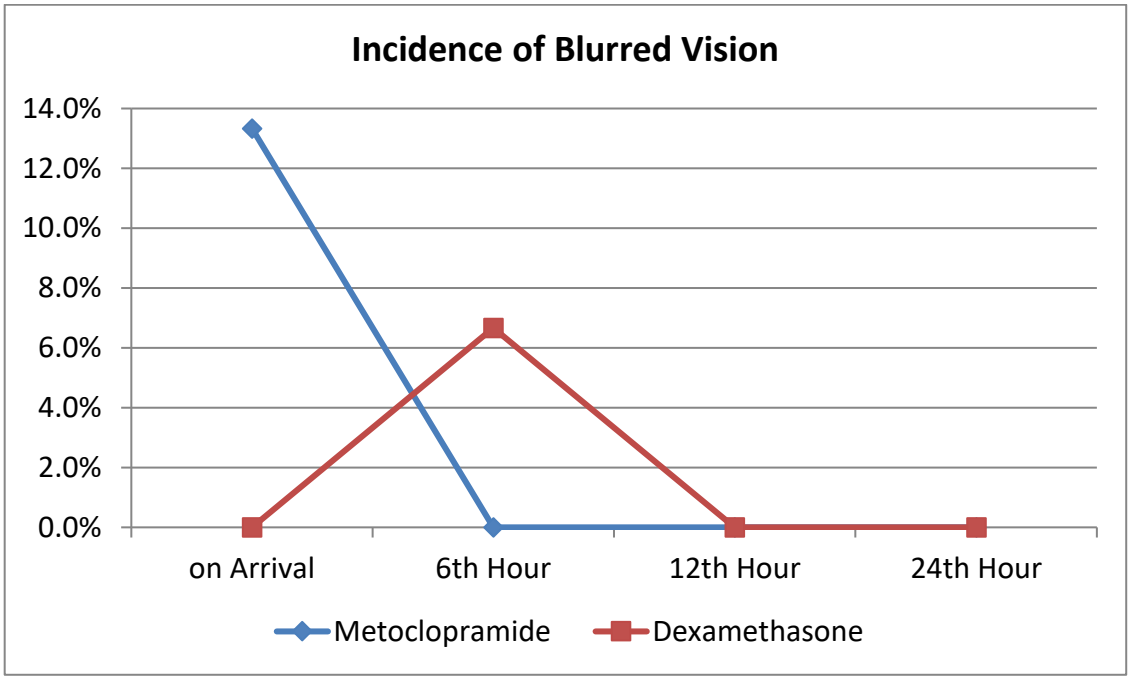


Figure F.2

Incidence of tremor (Arrival-24th Hours)

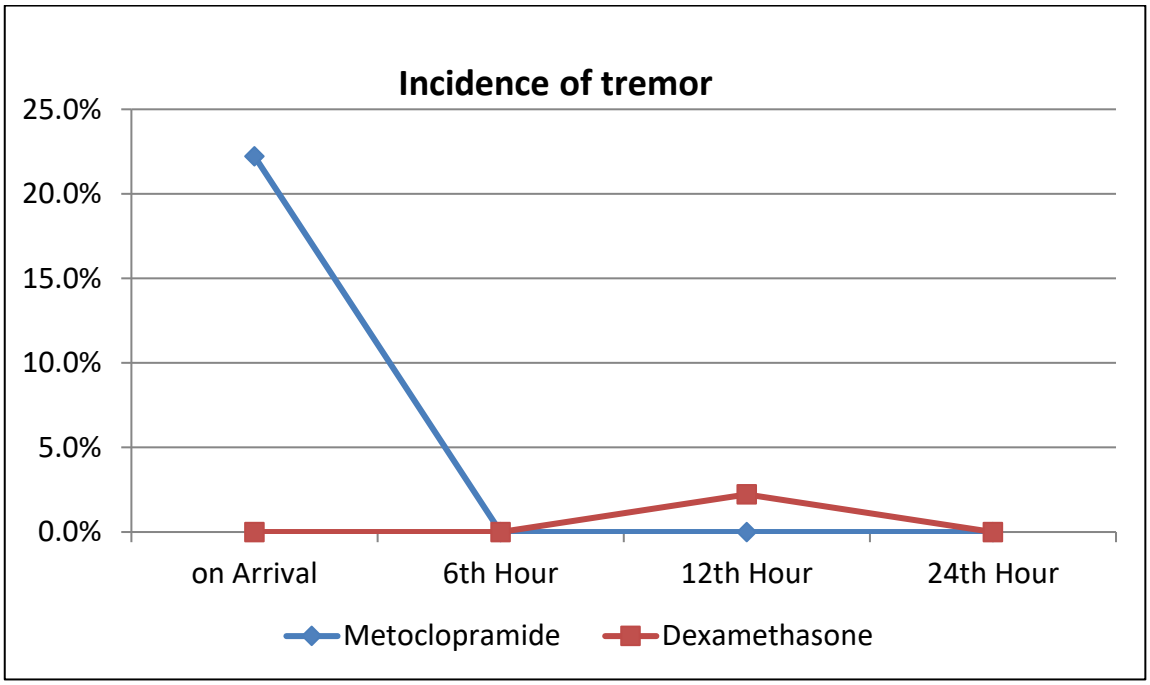


Figure F.3

Incidence of Nausea VAS scale

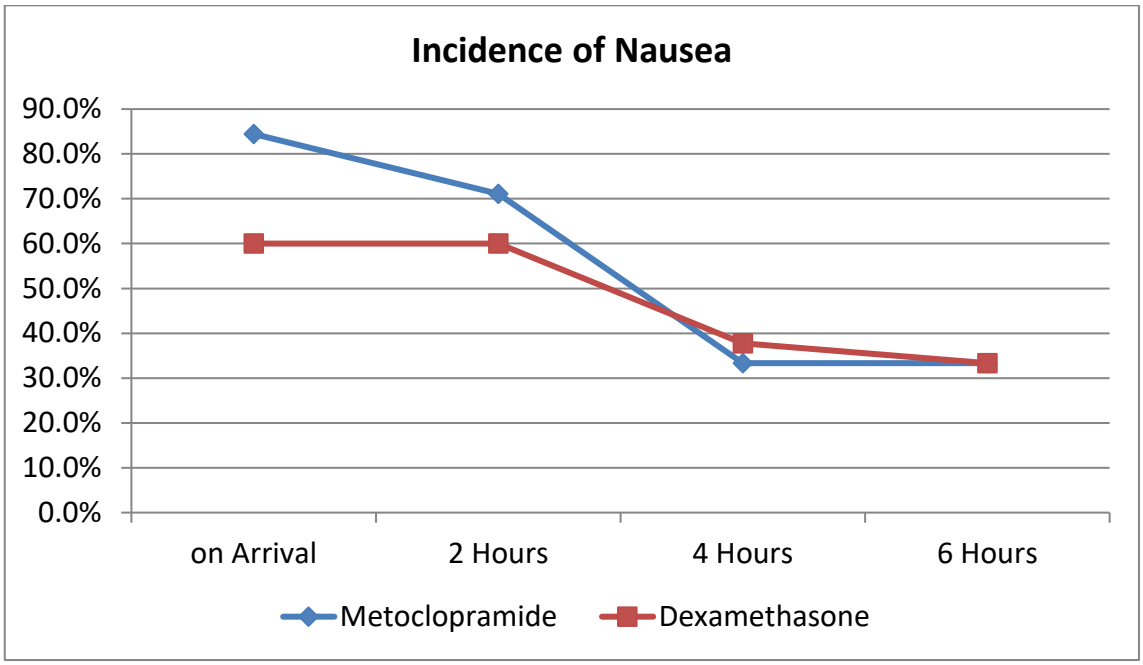


Figure F.4

Intensity of Nausea VAS scale

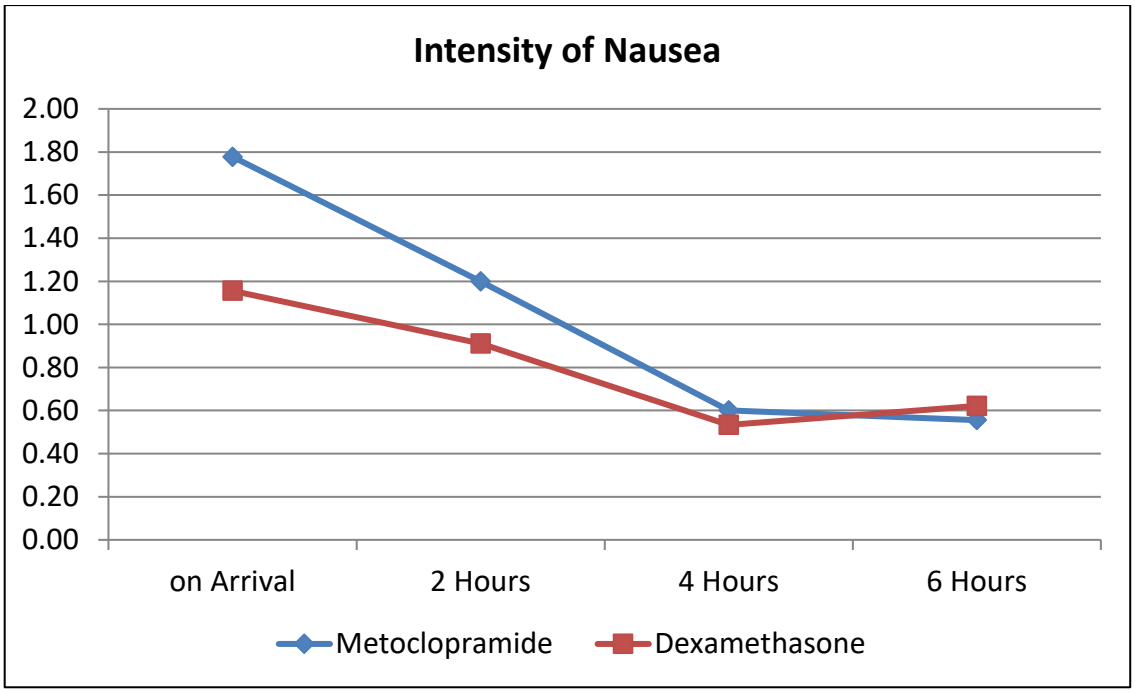


Figure F.5

Antiemetics use VAS scale

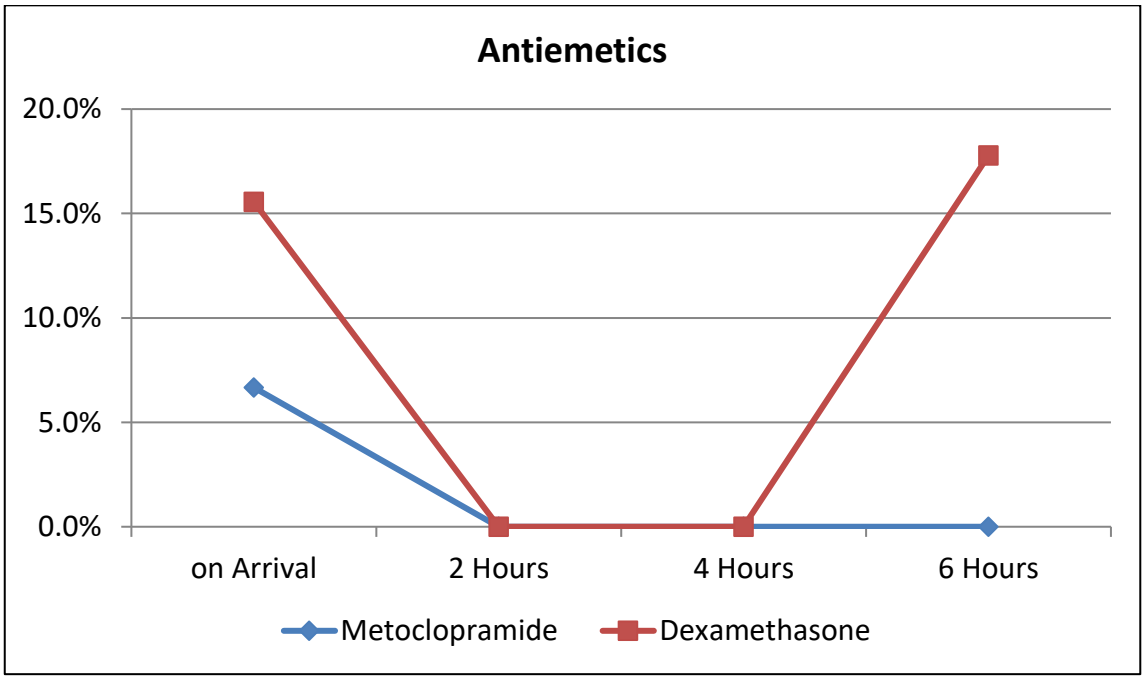


Figure F.6

Intensity of Pain VAS scale

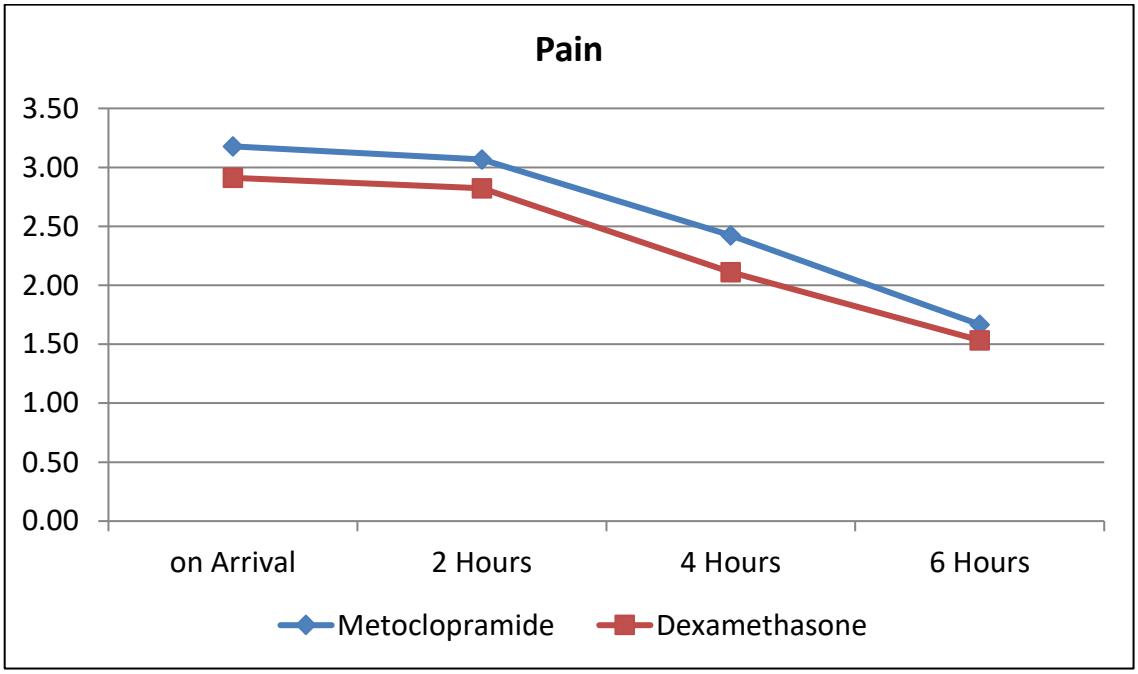
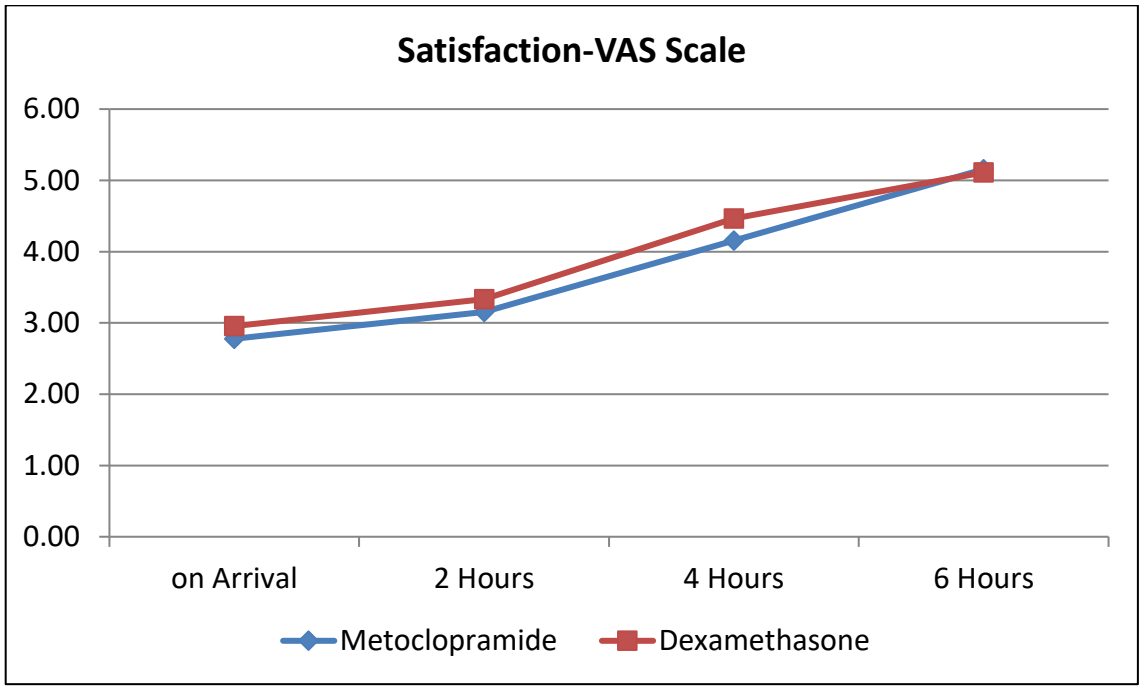


Figure F.7

Satisfaction-VAS Scale



جامعة النجاح الوطنية
كلية الدراسات العليا

فعالية مضادات القيء الوقائية لدى المرضى الخاضعين لجراحات بالمنظار: دراسة وصفية

اعداد
رغد عطية

اشراف
د. عايدة القيسي
د. أكرم الكحلة

قُدّمت هذه الرسالة استكمالاً جزئياً لمتطلبات درجة الماجستير في تمريض التخدير، من كلية الدراسات العليا، جامعة النجاح الوطنية، نابلس، فلسطين.
2025

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الملخص

الخلفية: يعد الغثيان والقيء بعد العملية الجراحية من المضاعفات الجراحية الشائعة وغير المريحة خاصة تحت التخدير العام؛ بالإضافة إلى أنه لم يتم تطوير مضادات دوائية فعالة للتقيؤ.

الأهداف: هدفت هذه الدراسة إلى مقارنة فعالية الميتوكلوبراميد الوقائي عن طريق الوريد (10 ملغ) الذي يُعطى قبل التنبيب مع ديكساميثازون (8 ملغ) الذي يُعطى عند بدء التخدير في الوقاية من التقيؤ التالي للجراحة بالمنظار خلال الـ 24 ساعة الأولى بعد جراحة المناظير. سعت الدراسة أيضًا إلى تقييم تأثيرها على الحاجة إلى الأدوية المضادة للقيء المنقذة وحدوث الألم بعد الجراحة وشدته وحدوث الآثار الجانبية ورضا المريض طوال مرحلة التعافي.

الأساليب: أُجريت الدراسة في أحد مستشفيات شمال الضفة الغربية في الفترة من أكتوبر 2024 إلى أبريل 2025، وشملت 90 مريضًا خضعوا لجراحة المناظير الاختيارية. قُسّم المرضى إلى مجموعتين: تلقت إحدى المجموعتين 8 ملغ من الديكساميثازون في الوريد عند تحريض التخدير، وتلقت المجموعة الأخرى 10 ملغ من الميتوكلوبراميد قبل التنبيب. تم قياس شدة الغثيان باستخدام مقياس ليكرت، وتم تقييم الألم بعد الجراحة باستخدام مقياس تقييم الألم بعد الجراحة باستخدام مقياس تقييم الألم. تم تقييم النتائج في وحدة الإنعاش وفي 6 و12 و24 ساعة بعد الجراحة.

النتائج: أظهرت مجموعة الميتوكلوبراميد نتائج أقل إيجابية بشكل ملحوظ، مع ارتفاع شدة الغثيان (1.82 مقابل 1.07)، واستخدام مضادات التقيؤ (44.4% مقابل 15.6%)، وآثار جانبية أكثر مثل الصداع

(73.3% مقابل 42.2%)، والإرهاق (77.8% مقابل 46.7%)، وعدم وضوح الرؤية (33.3% مقابل 8.9%)، والرعشة (35.6% مقابل 0%) في وحدة العناية المركزة. في الجناح (من 0–24 ساعة)، كان لديهم أيضًا نسبة عالية من الغثيان (84.4% مقابل 60%)، وشدة غثيان أكبر (1.78 مقابل 1.16)، ورؤية غير واضحة ورعشة أكثر. ومع ذلك، احتاجت مجموعة ديكساميثازون إلى مضادات الإقياء بشكل أكبر في وقت لاحق (في 6 ساعات: 17.8% مقابل 0%؛ 6.7% مقابل 33.3% من الوصول إلى 24 ساعة). كانت درجات الألم في 2 و4 ساعات أعلى مع ميتوكلوبراميد، وكانت درجات الرضا أقل (2.78 مقابل 2.96).

الخلاصة: يعد ديكساميثازون أفضل من ميتوكلوبراميد في منع الغثيان والقيء بعد الجراحة، مما يقلل من شدة الغثيان وتكرار الآثار الضارة ويحسن من رضا المريض. كما أنه يقلل من الحاجة إلى الأدوية المنقذة المضادة للقيء في وحدة العناية المركزة للعمليات الجراحية مما يؤكد تفضيله لمرضى الجراحة الاختيارية.

الكلمات المفتاحية: الغثيان والقيء بعد الجراحة، ديكساميثازون، ميتوكلوبراميد، الجراحة بالمنظار، أدوية مضادة للقيء الطارئة، رضا المرضى.