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Frequency of Predisposing Factor of Nausea and Vomiting after Chest Surgery under General Anaesthesia	
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Abstract:	
<p>Background: Postoperative nausea and vomiting are common and distressing postsurgical symptoms. These symptoms are of particular concern in outpatient surgery because they may require additional direct resources, such as supplies and antiemetic drugs, and may delay discharge. The objective of this study was to measure the frequency of factors which can cause nausea and vomiting under general anaesthesia after chest surgery.</p> <p>Methodology: This descriptive case series evaluated frequency of predisposing factor of nausea and vomiting in patients of anaesthesia department of Gulab Devi Hospital Lahore. Questionnaire is made and patients were asked about their age, fever, previous surgery, NPO status, smoking history and hospital stay. This study included 140 patients with post-operative nausea and vomiting.</p> <p>Results: In this study, 140 patients were taken in which 65 (46.43%) were female and 75 (53.57%) were male. In 140 patient 134 (95.7%) were NPO and 6 (4.3%) were not NPO, 25 (17.9%) were obese and 115 (82.1%) were not obese, 88 (62.9%) patients were suffering fever and 52 (37.1%) were not suffering fever, 80 (57.1%) were infected and 59 (42.1%) were not infected, 53 (37.9%) patients had previous surgery and 87 (62.1%) had no previous surgery, 94 (67.1%) patients had received nitrous oxide and 46 (32.9%) didn't, 97 (69.3%) received volatile gases and 43 (30.7%) not received, 29 (20.7%) received ketamine and 111 (79.3%) not received, 87 (62.1%) received suxamethonium and 53 (37.9%) not received, 119 (85.0%) received propofol and 21 (15.0%) not received, 110 (78.6%) received naluphine and 28 (20.0%) not received. Out of 140 patients, there were 122 (87.1%) who were suffering from pain and 18 (12.9%) were not. 91 (65.0%) patients had gastric distention and 49 (35.0%) patients didn't. Opioids were given to 34 (24.3%) patients and not given to 106 (75.7%) patient.</p> <p>Conclusion: It is concluded that the nausea and vomiting after surgery under general anaesthesia is due to patient related factors in which most frequent is NPO. Drug related factors include propofol and nalbupin administration. Post operative factors include pain. In whole study of 140 patients, the most frequent is patient related factor (NPO) other than drug related factors and post-operative factors.</p> <p>Key words: Nausea, Vomiting, Anaesthesia</p>	
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Introduction:

Nausea and vomiting are basic human protective reflexes against the absorption of toxins as well as responses to certain stimuli.

(1) The terms nausea and vomiting are often used together, although each phenomenon

should be assessed separately. Nausea is defined as a subjectively unpleasant wavelike sensation in the back of the throat or epigastrium associated with pallor or flushing, tachycardia, and an awareness of the urge to vomit. (2) Sweating, excess

salivation, and a sensation of being cold or hot may occur. Vomiting, or emesis, is characterized by contraction of the abdominal muscles, descent of the diaphragm, and opening of the gastric cardiac resulting in forceful expulsion of stomach contents from the mouth.

Post-operative nausea and vomiting, defined as nausea and or vomiting occurring within 24 hours after surgery, affects between 20% and 30% of patients (3) and as many as 70% to 80% of patients at high risk may be affected. (4) The aetiology of post-operative nausea and vomiting is thought to be multifactorial including female sex, smoking, prior history of post-operative nausea and vomiting, pain, dizziness, opioids, gastric distension, motion sickness, use of opioids during and after surgery, use of inhalational anaesthetics and nitrous oxide, duration of anaesthetics and surgical risk factors. (5) Post-operative nausea and vomiting results in increased patient discomfort and dissatisfaction and in increased costs related to length of hospital stay. One study revealed that the time to discharge was increased by 25% in patients with post-operative nausea and vomiting. (6) Serious medical complications such as pulmonary aspiration, although uncommon, are also associated with vomiting. (7) Post-operative nausea and vomiting is a significant problem for patients. (8) Several thousand studies examining post-operative nausea and vomiting have been published, and several hundred new papers are published each year on the topic. Guidelines for the prevention and management of post-operative nausea and vomiting have been published by anaesthetic journals and societies.(9).

Post-operative nausea and vomiting (post-operative nausea and vomiting) continues to be a common complication of surgery. It is a limiting factor in the early discharge of ambulatory surgery patients and is a leading cause of unanticipated hospital admission. (10) Post-operative nausea and vomiting can lead to increased recovery room time, expanded nursing care, and potential hospital admission — all factors that may increase total health care costs. Among high-risk patients, the incidence of post-operative nausea and vomiting can be as frequent as 70% to 80% (11). Published evidence suggests that universal post-operative nausea and vomiting prophylaxis is not cost-effective. Although some advocate prophylactic antiemetic therapy for high-risk patients and rescue antiemetic treatment for episodes of post-operative nausea and vomiting, the optimal approach to post-operative nausea and vomiting management remains unclear to many clinicians. Guidelines for prevention and treatment of post-operative nausea and vomiting based on data from systematic reviews of randomized trials have been published the panel agreed that not all patients should receive post-operative nausea and vomiting prophylaxis. In general, patients at small risk for post-operative nausea and vomiting are unlikely to benefit from prophylaxis and would be put at unnecessary risk from the potential side effects of antiemetic. Thus, prophylaxis should be reserved for those patients at moderate to high risk for post-operative nausea and vomiting. in developing these guidelines, the panel deliberately chose, for several reasons, not to quantify the percentage of patients who would be in the

low-, moderate-, and high-risk categories. The sensitivity and specificity of the various risk scoring systems are not 100% (only approximately 70%) and hence have a degree of uncertainty. (12) Even if health care providers knew with confidence the true underlying risk, the need for prophylaxis, would be universally accepted.

The aim of this study is to find frequency of predisposing factors of nausea and vomiting after chest surgery under general anaesthesia.

Materials and Methods:

This descriptive case series includes 140 cases at post-operative ward of chest surgery department at Gulab Devi Hospital and General Hospital Lahore. Cases were included through non-probability sampling technique. Patients with chest and cardiac surgery in general anaesthesia were included only.

Table 3. Frequency of Patient Related Factors

Factors	Total	Yes	No
NPO	140	134(95.7)	6(4.3)
Obesity	140	25(17.9)	115(82.1)
Fever	140	88(62.9)	52(37.1)
Infection	140	80(57.1)	59(42.1)
Previous surgery	140	53(37.9)	87(62.1)

This descriptive case series evaluated frequency of predisposing factor of nausea and vomiting in patients of anaesthesia department of Gulab Devi Hospital Lahore and Lahore General Hospital. Questionnaire was made and age, fever, previous surgery, NPO status, infection, abdominal distention, pain, opioids, smoking history, and hospital stay of participants were included.

The data analysed by using SPSS version 20.0. The qualitative data is presented in the form of charts and tables along its percentage. The pie chart is made for qualitative data.

Results:

Gender distribution of patients is illustrated in Figure 16, frequency of patient related factors are enlisted in In this study of 140 patients including 65 (46.43%) females and 75 (53.57%) males, 134 (95.7%) were NPO, 25 (17.9%) was obese, 88 (62.9%) patients were suffering fever, 80 (57.1%) were infected, 53 (37.9%) patients had previous surgery. Drug related factors are found as 94 (67.1%) patients had received nitrous oxide, 97 (69.3%) received volatile gases, 29 (20.7%) received ketamine, 87 (62.1%) received suxamethonium, 119 (85.0%) received propofol, 110 (78.6%) received nalbuphine. Frequency of post-operative related factors was as 122 (87.1%) were suffering from pain, 91 (65.0%) patients had gastric distention and opioids were given in 34 (24.3%) patients.

Table 4. Frequency of Drug Related Factors, frequency of drug related factors are entitled in **Error! Reference source not found.** and frequency of post operative factors are resumed in **Error! Reference source not found.**

Drug	Total	Effect	No effect
Nitrous oxide	140	94 (67.1%)	46 (32.9%)
Volatile gases	140	97 (69.3%)	43 (30.7%)
Ketamine	140	29 (20.7%)	111 (79.3%)
Suxamethonium	140	87 (62.1%)	53 (37.9%)
Factor	Total	Yes	No
Propofol	140	119 (85.0%)	21 (15.0%)
Pain	140	122 (87.1%)	18 (12.9%)
Gastric	140	91 (65.0%)	49 (35.0%)
Nalbuphine	140	110 (78.6%)	20 (14.3%)
Opioids	140	34 (24.3%)	106 (75.7%)

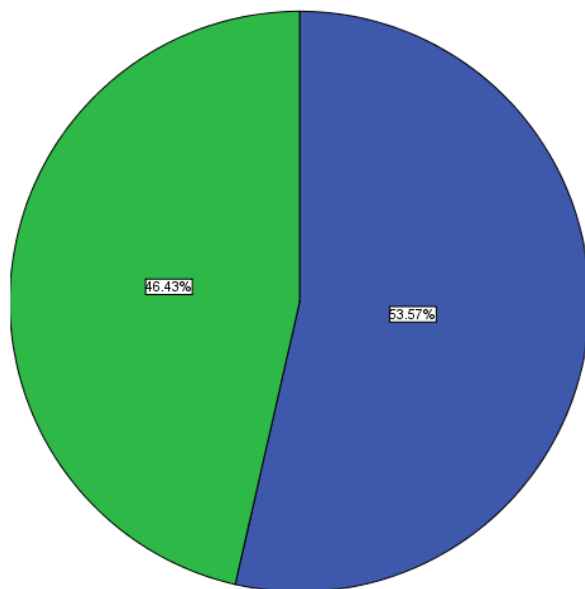


Figure 16. Gender Distribution of Participants

In this study of 140 patients including 65 (46.43%) females and 75 (53.57%) males, 134 (95.7%) were NPO, 25 (17.9%) was obese, 88 (62.9%) patients were suffering fever, 80 (57.1%) were infected, 53 (37.9%)

patients had previous surgery. Drug related factors are found as 94 (67.1%) patients had received nitrous oxide, 97 (69.3%) received volatile gases, 29 (20.7%) received ketamine, 87 (62.1%) received suxamethonium, 119 (85.0%) received propofol, 110 (78.6%) received nalbuphine. Frequency of post-operative related factors was as 122 (87.1%) were suffering from pain, 91 (65.0%) patients had gastric distention and opioids were given in 34 (24.3%) patients.

Table 4. Frequency of Drug Related Factors

Table 5. Frequency of Post-Operative Factors

Discussion:

A study was conducted in 2003 by Tatić Milanka reporting postoperative nausea and vomiting (PONV) and the pain are the most common complaints following anaesthesia and surgery. Due to negative emotional impact on patients, they cause prolonged postoperative recovery. The incidence of PONV is 20-30% during the first 24 hours after anaesthesia. Both peripheral and central mechanisms are involved in control of emesis. Many factors associated with anaesthesia and surgery may affect PONV: patient's age, sex, history of PONV after pervious anaesthesia, administration of antiemetic's prior to operation, type and duration of operation, type of premedication, induction agent, maintenance agent, reversal of muscle relaxation, treatment of postoperative pain and movement of patients. Antagonists of 5-hydroxytryptamine-3 (5-HT3) receptors, ondansetron is a competitive serotonin type-3 receptor antagonist important in prevention of PONV. However, if 5-HT3 receptor antagonists are effective against nausea and vomiting after variety of anaesthetic and surgical procedures then at least one way of prophylaxis is available. Prophylaxis with a combination of antiemetic

drugs is more effective in prevention of PONV.

A study was conducted in 1992 by J. LERMAN describing three kinds of vomiting. First, attributed to anaesthetics such as ether, the second to reflex responses e.g., pain and the last to opioids e.g., morphine. Before this study, anaesthetics alone were thought to be responsible for postoperative nausea and vomiting. (13) Subsequent investigations unfolded a spectrum of non-anaesthetic factors in the pathogenesis of PONV including age, gender, motion sickness, body habitus, surgical site and postoperative feeding procedures. It is evident that PONV is affected by many factors including age and gender of the patient, premedication, anaesthetic technique and medication, postoperative analgesia and regional blocks, and type of surgery. (14) The incidences of PONV have remained fairly constant at 10% in the recovery room and 30% for the first 24 hours after anaesthesia in several large series of patients for the past several decades. (13) A study conducted in 2004 reported numerous pathophysiological mechanisms to cause post-operative nausea and vomiting. Volatile anaesthetics, nitrous oxide and opioids appear to be the most important causes for PONV. (15) Female gender, non-smoking and history of motion sickness are the most important patient specific risk factors. With these risk factors an objective risk assessment is achievable as a good rational basis for a risk dependent antiemetic approach. When the risk is low, moderate, or high, the use of none, a single or a combination of prophylactic antiemetic interventions respectively seems to be justified. (16) Performing a total intravenous anaesthesia (TIVA) with Propofol is a reasonable prophylactic approach, but does

not solve the problem satisfactorily alone if the risk is very high, reducing the risk of PONV only by 30%. This is comparable to the reduction rate of antiemetic's such as serotonin antagonists, dexamethasone and droperidol. It must be stressed that metoclopramide is ineffective. Data from IMPACT indicate that prophylaxis is not very effective if the patients risk is low. At a moderate risk the use of TIVA or an antiemetic is reasonable and only a high risk justifies the combination of several prophylactic antiemetic intervention. (15, 17) (18)

Conclusion:

It is concluded that the nausea and vomiting after surgery under general anesthesia is due to patient related factor in which most frequent is NPO, in drug related factors most frequent is propofol and nalbupin and in post-operative factors, most frequent is pain. In whole study of 140 patients, the most frequent is patient related factor (NPO).

Conflict of interest: Authors do not have any conflict of interest.

Human and Animal Rights: No human rights violated during the study.

Informed Consent: An informed consent was obtained by each case.

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**Supplementary File 1:
Study Questionnaire**

Frequency of predisposing factor of nausea and vomiting after chest surgery under General

Anesthesia

Patient name _____ s/o w/o d/o _____

Age _____ Gender _____

MR# _____ date _____

Patient related Factors:

fever	yes	<input type="checkbox"/>	no	<input type="checkbox"/>
obesity	yes	<input type="checkbox"/>	no	<input type="checkbox"/>
Infection	yes	<input type="checkbox"/>	no	<input type="checkbox"/>
Previous surgery	yes	<input type="checkbox"/>	no	<input type="checkbox"/>
NPO	yes	<input type="checkbox"/>	no	<input type="checkbox"/>

anesthetics drug related Factors:

Nitrous oxide	yes	<input type="checkbox"/>	no	<input type="checkbox"/>
Propofol	yes	<input type="checkbox"/>	no	<input type="checkbox"/>
ketamine	yes	<input type="checkbox"/>	no	<input type="checkbox"/>
Suxamethonium	yes	<input type="checkbox"/>	no	<input type="checkbox"/>
Nalbrphine	yes	<input type="checkbox"/>	no	<input type="checkbox"/>

Post-operative Factors:

Pain	yes	<input type="checkbox"/>	no	<input type="checkbox"/>
Dizziness	yes	<input type="checkbox"/>	no	<input type="checkbox"/>
Opioids	yes	<input type="checkbox"/>	no	<input type="checkbox"/>
Gastic distion	yes	<input type="checkbox"/>	no	<input type="checkbox"/>