



To Study The Occurrence Of Postoperative Nausea And Vomiting In Patient After General Anaesthesia

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ABSTRACT

The growing tendency toward ambulatory and daycare procedures, postoperative nausea and vomiting (PONV) are one of the most challenging and important issues in anesthesia management. The pathogenesis, pharmacological prevention, and rescue therapy for PONV are the main topics of this review. Multiple patient, surgical, pre-, intra-, and post-operative anesthesia-related factors can affect PONV. Medication has a main role effect the neural pathway. The desire to vomit is referred to as nausea. A forceful evacuation of stomach contents is referred to as vomiting. PONV was linked to a history of motion sickness, young age, female status, and non-smoking status. An evaluation of the risk of PONV can be done using a scoring system, such as the Apfel simplified scoring system, which is based on four independent risk factors.

Introduction

During GA, patients are unconscious and do not feel any pain. General Anaesthesia is a more commonly used anaesthesia technique but comes with certain risks and complications. The unconsciousness of the patient is achieved by the inhalational or intravenous anaesthetic agent or both combinations can be used. One of the most prevalent adverse effects of general anaesthetic is post-operative nausea and Vomiting (PONV), second only to pain. Its occurrence is 20 -30 % in patients under GA.¹

Although nausea and vomiting can occur independently, they are quite similar. Medication has a main role effect the neural pathway. The desire to vomit is referred to as nausea. A forceful evacuation of stomach contents is referred to as vomiting. PONV was linked to a history of motion sickness, young age, female status, and non-smoking status.²

In regular postoperative analgesic treatment, opioids play a significant role. Patients controlled analgesia (PCA) is used to relieve pain.¹⁰ As a consequence, patients who receive (IV-PCA) have at least one risk factor for PONV, indicating that a complete assessment of PONV and preventive therapy should be investigated to minimize or prevent PONV.³The vomiting center, which is located in the medulla

oblongata, is made up of the reticular formation and the nucleus of the tractus solitarius. When this center is activated, motor pathways drop from it, triggering vomiting. These efferent routes are carried via the cranial nerves, as well as the vagal and sympathetic nerves, to the upper and lower gastrointestinal systems, respectively.⁴

In patients at moderate to high possibility for postoperative nausea and vomiting, serotonin (5-hydroxytryptamine [5-HT]) receptor antagonists, which reduce serotonin's stimulatory influence on the afferent vagal nerve pathway and the chemoreceptor trigger zone, are among the drugs of choice (PONV).⁵

These medications have been shown to be effective, acceptable, and cost-effective for PONV prevention when administered as monotherapy after the completion of anesthesia.⁶ Ondansetron, which we chose to test for its influence on tramadol's action, is a 5-HT₃ receptor antagonist we chose to test for its influence on tramadol's action, is a 5-HT₃ receptor antagonist that is commonly used for PONV prophylaxis.⁷

Material & Methods



A randomized study was carried out at SGT Medical College, Hospital and Research Institute Budhera, Gurugram, Haryana. The study was conducted after obtaining approval from the ethical committee. Sixty patients undergoing GA were enrolled for the study. In the age group of 18-60 years fitting to American Society of Anaesthesiology (ASA) category I & II. The demographic shape of the study groups such as name, age, sex, surgical procedure was recorded. On the day of surgery, consent was reviewed and willingness to participate was confirmed. Patients were asked to complete a short questionnaire to identify common risk factors for PONV. Following completion of this paperwork, patients were taken to the operating room (OR). Intravenous (IV) line was secured. Standard monitoring including a pulse oximeter, electrocardiogram, end-tidal CO₂, non-invasive blood pressure (NIBP) and the temperature was done. Patients were pre-oxygenated with 100% oxygen for 3 min using a bag-mask and IV analgesia was given with Nalbuphine 0.2 mg/kg, GA was induced with Propofol 2 mg/kg IV.

Succinylcholine 1.5 mg/kg IV was used for intubation. All the patients were intubated with an appropriate sized cuffed endotracheal tube (ETT), bilateral air entry checked by auscultation of lungs and end-tidal CO₂ sampling. GA was maintained with 40% oxygen, 60 % Nitrous oxide, Isoflurane 1% and long-acting neuromuscular blocking agent vecuronium. Inj. Paracetamol 15 mg /kg was be given by IV infusion for further intra-operative analgesia. At the completion of the surgery, all the patients were given Inj. glycopyrrolate 0.008mg/kg mg with Inj. neostigmine 0.05 mg/kg for reversal of neuromuscular blockage.

Pharyngotracheal suction done and exudation done after adequate reversal. The patients were shifted to Post Anaesthesia Care Unit (PACU).

The details regarding medication and duration of surgery were recorded. All the study members were tracked every 15 min breaks in PACU and later 6 hr. intervals for 24hr. All the patients were enquired about the incidence of retching/vomiting episodes at 15min intervals in the PACU and later 6hr intervals in the ward for 24 hr.

Ondansetron 0.1mg/kg IV was be given in case of vomiting. The patient's vital were also recorded. Any other complication in the PACU was also noted. For postoperative pain control inj. Paracetamol and inj. Diclofenac was be used. The specifics of anti-emetics used to treat PONV throughout the postoperative phase were noted, along with dosage and frequency.

Statistical Analysis

The data from all the tests will collected and subjected to appropriate statistical method using SPSS software, Graph pad prisms software. Mean and standard deviations of these value and index will be calculated.

Results

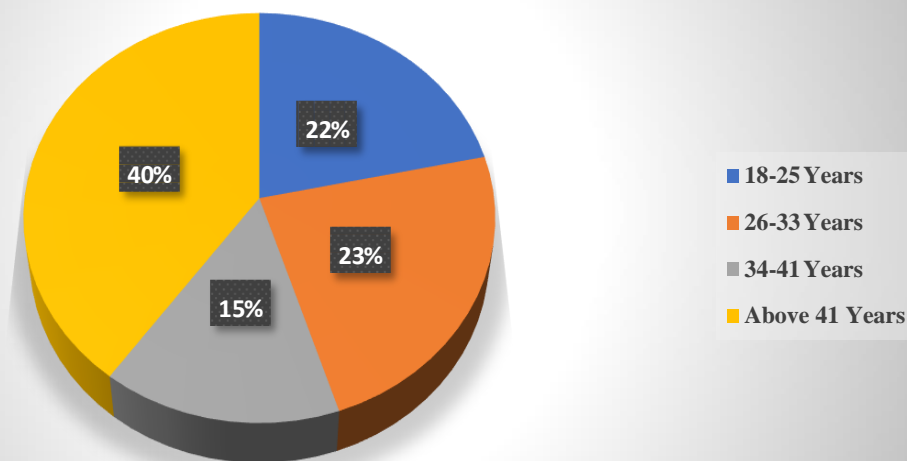
60 patients were taken in this study. From 60 patients we found 32 patients (53%) experienced nausea and 23 patients (38%) experienced vomiting.

GENDER AND AGE

Total patient consisted of 27% Male (16/60) and 73 % Female (44/60).

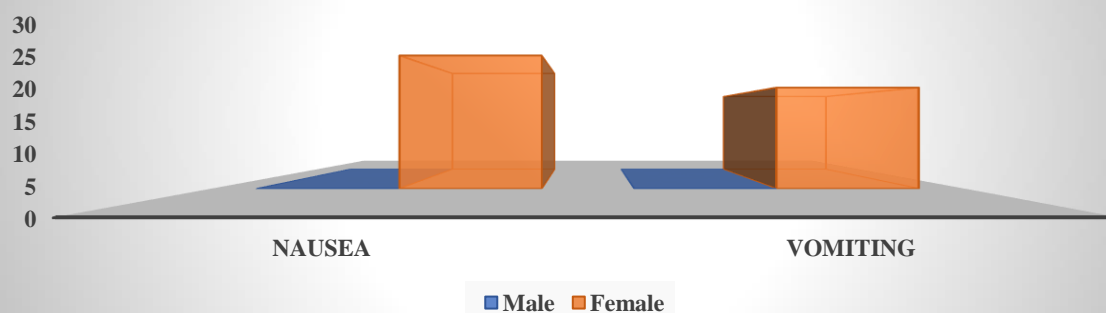
Table 1. Distribution of age group in year

Age Group	Frequency(n=60)	Percentage
18-25 Years	13	22.00%
26-33 Years	14	23.00%
34-41 Years	9	15.00%
Above 41 Years	24	40.00%

**Figure 1: Age distribution of the study participants**

In the present study (Table 1 and figure 1) show the distribution of study participants according to age. Majority of group was above 41 years (40%), followed by age group 26-33 years were 23%. About 22.00% belonged age group 18-25 years and rest 15.00% was under the age group of 34-41 years. None of the male

patient experienced either nausea or vomiting, among the female patients 48% experienced nausea and 37 % vomiting. Clearly in our limited study, it can be understood that most of the PONV symptoms are much more prominent in female in comparison to males.

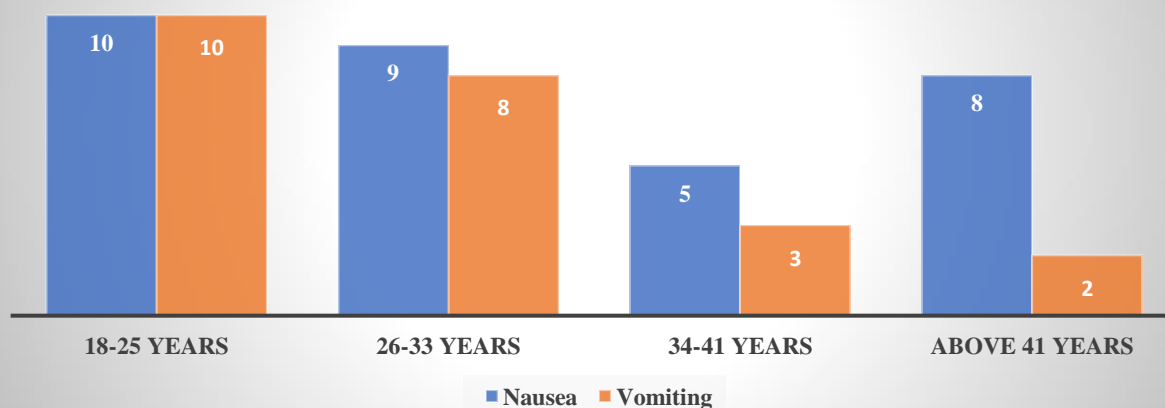
Figure 2: sex-Wise distibursion of the study partiipants according to nausea and Vomiting

In our study we take 19 to 60 years patients with an average of 37.8 mean. 18-25 years patients showed greatest incidence of PONV (77%). It can be inferred from the data that there is a significant reduction in PONV symptoms with increase

the age. There is an inversely proportionate relationship between the age of patients and PONV symptoms.



Figure 3: Distribution of Nausea and Vomiting Complications according to the age



Intraoperative Factors and PONV

Types of surgery

There are 5 types of surgery performed within the scope of our study.

1. Craniotomy
2. Hernioplasty

3. Laminectomy

4. Laparoscopic cholecystectomy

5. Lumpectomy

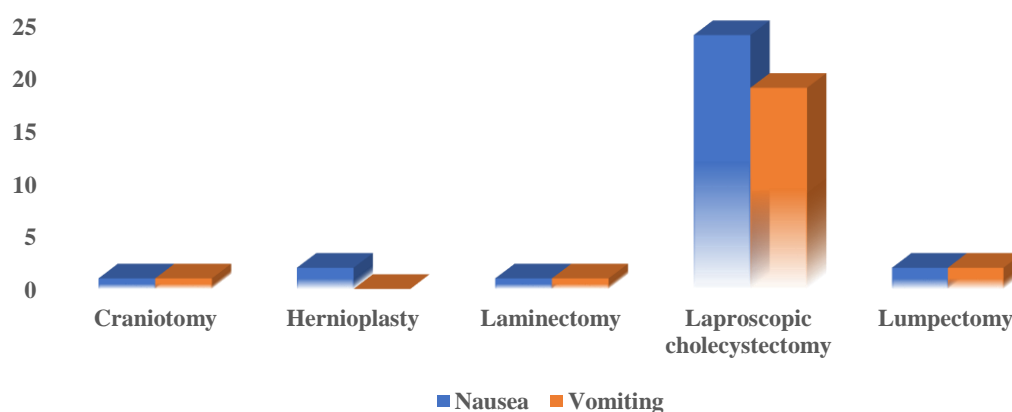
Most of the patients 40 (67%) underwent laparoscopic cholecystectomy

Table 2. Distribution of nausea and vomiting according to the types of surgery

Types of Surgery	Nausea		Vomiting	
	Yes (%)	No (%)	Yes (%)	No (%)
Craniotomy	1(13%)	7(87%)	1(13%)	7(87%)
Hernioplasty	2(40%)	3(60%)	0(0%)	5(100%)
Laminectomy	1(20%)	4(80%)	1(20%)	4(80%)
Laparoscopic Cholecystectomy	24(60%)	16(40%)	19(48%)	21(52%)
Lumpectomy	2(100%)	0(0%)	2(100%)	0(0%)



FIGURE 4: DISTRIBUTION OF TYPES OF SURGERY OF THE STUDY PARTICIPANTS ACCORDING TO THE NAUSEA AND VOMITING

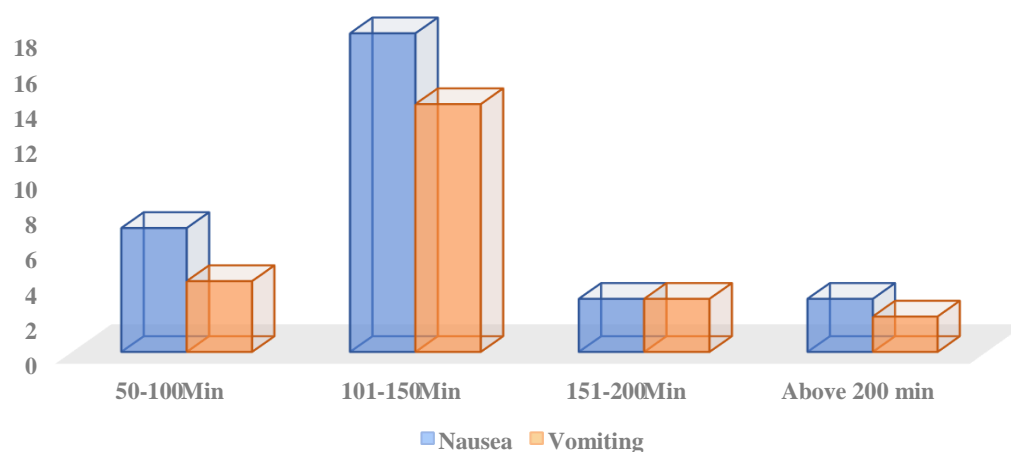


In present study we found that most of the patients 40(67%) underwent the Laparoscopic cholecystectomy. 8(13%) Patient underwent craniotomy, 5(8%) patients underwent hernioplasty, 5(8%) Patients underwent laminectomy, 2(4%) patients underwent Lumpectomy.

Out of 40 patients that's underwent Laparoscopic cholecystectomy surgery, 24 (60%) showed symptoms of nausea and 19 (48%) showed symptoms of vomiting.

Duration of surgery

FIGURE 5: DISTRIBUTION OF DURATION OF SURGERY OF THE STUDY PARTICIPANTS ACCORDING TO THE NAUSEA AND VOMITING



Most of the patients in our study (47%) have undergone a surgery with in the time limit of 101 -150.

Duration of anaesthesia

**Table 3.** Distribution of nausea and vomiting according to duration of anesthesia

Duration of Anaesthesia	Nausea		Vomiting	
	Yes (%)	No (%)	Yes (%)	No (%)
40-90 Min	9(43%)	12(57%)	6(29%)	15(71%)
90-140 Min	12(55%)	10(45%)	11(50%)	11(50%)
140-190 Min	6(55%)	5(45%)	4(36%)	7(64%)
Above 190 Min	3(50%)	3(50%)	2(33%)	4(67%)

Most of the patients in our study (37%) that were under the effect of anaesthesia belong to the time group (90-140 min).

Discussion

The present study showed the incidence of 20% -30% PONV after general anaesthesia. Nowadays new technique & equipment reduces life-threatening complications. But none of the activities can fully prevent PONV. PONV incidence depends on various factors. such as surgery like ENT, tonsillectomy and laparoscopy. It depends on age, sex, duration of surgery, duration of anaesthesia and drugs.

The study conducted showed 53% experienced nausea and 38 % experienced vomiting after PONV after GA. IT is important that the surgeon and anesthesiologist know the risk factor associated with the condition to identify the patient who is at high risk or surfing from PONV.

Younger patients (15–25 years old) have more incidence of PONV. Other factors also depend according to Silva et al.⁸ We found in our study that age was significantly related to PONV. Younger patients less than 25 years they have higher incidence of PONV. Older age has less incidence of PONV.

In a similar study, Alexander et al.⁹ discovered a link between PONV and female sex. They found that female have more risk PONV as compare to male sex. Female has been more risks factors for PONV after surgery. This is also seen in previous thesis and article. We also find that female have more incidence of PONV as compare to male.

In our study we also found that duration of anesthesia is also affect the incidence of PONV. If the duration of anesthesia is longer than 2 hours, they have more risk of incidence of PONV.

Similarly, duration of anesthesia also affects the PONV incidence. If anesthesia is shorter than PONV is low risk. if they have longer duration of anesthesia than higher the risk of PONV.

Conclusion

The following conclusion can be derived from the study:

1. Patients in the younger age group 18 -25 years show more the incidence of PONV then other ages.
2. Females with PONV have more than males. The value of statistically not significant.
3. Duration of surgery is longer than incidence of PONV is higher.
4. Duration of anaesthesia is longer than incidence of PONV is also higher.

Though our sample size consisted of only 60 patients, still, significant-conclusion can be derived from our study.

References

1. Apipan B, Rummasak D, Wongsirichat N. Postoperative nausea and vomiting after general anesthesia for oral and maxillofacial surgery. *J Dent Anesth Pain Med.* 2016; 16(4):273-281.
2. Silva AC, O'Ryan F, Poor DB. Postoperative nausea and vomiting (PONV) after orthognathic surgery: a retrospective study and literature review. *J Oral Maxillofac Surg.* 2006; 64(9):1385-97.
3. Yi MS, Kang H, Kim MK, Choi GJ, Park YH, Baek CW, Jung YH, Woo YC. Relationship between the incidence and risk factors of postoperative nausea and vomiting in patients with intravenous patient-controlled analgesia. *Asian J Surg.* 2018; 41(4):301-306.
4. Becker DE. Nausea, vomiting, and hiccups: a review of mechanisms and treatment. *AnesthProg.* 2010 Winter;57(4):150-6; quiz 157. doi: 10.2344/0003-3006-57.4.150. PMID: 21174569; PMCID: PMC3006663.
5. A. L. Kovac, "Updates in the management of postoperative nausea and vomiting," *Advances in Anesthesia*, vol. 36, no. 1, pp. 81–97, 2018.
6. L. Kovac, "Prophylaxis of postoperative nausea and vomiting: controversies in the use of serotonin 5-hydroxytryptamine subtype 3 receptor antagonists," *Journal of Clinical Anesthesia*, vol. 18, no. 4, pp. 304–318, 2006.



7. T. J. Gan, P. Diemunsch, A. S. Habib et al., "Consensus guidelines for the management of postoperative nausea and vomiting," *Anesthesia & Analgesia*, vol. 118, no. 1, pp. 85–113, 2014.
8. Silva AC, O'Ryan F, Poor DB. Postoperative nausea and vomiting (PONV) after orthognathic surgery: a retrospective study and literature review. *J Oral Maxillofac Surg.* 2006;64(9):1385-97.
9. Alexander M, Krishnan B, Yuvraj V. Prophylactic antiemetics in oral and maxillofacial surgery: a requiem? *J Oral Maxillofac Surg.* 2009;67(9):1873-7.
10. J. L. De Witte, B. Schoenmaekers, D. I. Sessler, and T. Deloof, "The analgesic efficacy of tramadol is impaired by concurrent administration of ondansetron," *Anesthesia & Analgesia*, 2001; 92(5):1319–1321.