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Occurrence of Post-Operative Nausea and Vomiting among Adult Patients Undergoing Laparoscopic Procedures in The Post Anesthesia Care Unit: Cross sectional study at Tertiary Care Hospital.

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Abstract

Background: Post-operative nausea and vomiting is a common complication occurs after laparoscopic procedures and it have been associated with after procedure morbidity. There were scarce data that examined the occurrence of post-operative nausea and vomiting after laparoscopic procedures. The aim of this study was to estimate the occurrence of post-operative nausea and vomiting among adult patients underwent laparoscopic procedures.

Methods: we carried out a prospective single cohort study among adult patients who were scheduled for laparoscopic procedure under general anesthesia between October 2013 to 2018. Each eligible patient was interviewed using structured questioner after the procedure. Other related demographic and clinical factors were extracted from patient's electronic medical file. Chi-Square test was used to find the association between the variables (and the incidence of post-operative nausea and vomiting.

Results: A total of 130 patients were included in this study, 39 (30%) of them were males, and the mean age of the sample was 41.43 (27.855 to 55) year. The result revealed that only 3.1% of patients experienced post-operative nausea and vomiting after the laparoscopic procedure. The study showed that the relationship between the incidences of post-operative nausea and vomiting and the history of post-operative nausea and vomiting, motion sickness, smoking status, and gender was statistically insignificant with $P > 0.05$.

Conclusions: The result of this study showed that the incidence of post-operative nausea and vomiting was 3.10%. History of post-operative nausea and vomiting, motion sickness, smoking status, and gender were consider as independent risk factors for postoperative nausea and vomiting

Introduction

Many patients undergoing elective surgeries have post-operative complications that can lead to related morbidity.[1],[2]A laparoscopic procedure is a surgical technique which use carbon dioxide to be insufflated into the abdomen in continuous flow to maintain a

pneumoperitoneum at a constant pressure to provide enough space for the laparoscope to be placed inside the abdomen.[3]Laparoscopic procedures which are performed under general anesthesia have been associated with post-operative nausea and vomiting that commonly occurs in post anesthesia care unit .[3]Although laparoscopic procedures are considered as a risk factor of post-operative nausea and vomiting, the use of general anesthetics have also been linked to the occurrence of post-operative nausea and vomiting.[4] Excessive post-operative nausea and vomiting can be associate with high risk of dehydration and electrolyte imbalance.[1] Delay in the recovery time from the post-operative nausea and vomiting can lead to a delay in patient discharge, which in return increases the cost on the hospital.[1][5],[6]

Recently, laparoscopic procedures are widely used these days in different operations such as, cholecystectomy, appendectomy, gynecology, and other surgeries more than open surgeries or regular surgeries[7],[8]. Thus, laparoscopic procedures have the many advantages such as less recovery time, less pain, and low incidence of wound infection.. [7] Many studies have indicated that laparoscopic procedures were associated with high risk of post-operative nausea and vomiting compare to regular surgeries. [9] For instance, a study conducted by Iitomi *et al*, showed that laparoscopic cholecystectomy has a high risk of post-operative nausea compared to open cholecystectomy. [9] The suggested pathophysiological mechanism of the nausea and vomiting after the laparoscopic procedure is related to the pneumoperitoneum pressure that created during laparoscopy and the residual gas in the abdomenal cavity. [10],[11]

Several studies showed that in order to prevent post-operative nausea and vomiting, utilization of regional anesthesia rather than general anesthesia is recommended, because the use of agents that induce emesis is avoided when regional anesthesia is possible[12],[13] Since volatile agents provoke nausea and vomiting, the use of total intravenous anesthesia (TIVA) is advised because propofol is considered an antiemetic agent. [14],[15]

There is few studies that have examined the occurrence of post-operative nausea and vomiting after laparoscopic procedure. This study, therefore; intended to estimate the incidence of post-operative nausea and vomiting among adult patients undergoing laparoscopic procedures in the post-anesthesia care unit at National Guard Health Affairs (NGHA). The secondary objective of this study is to identify the main risk factors that induce post-operative nausea and vomiting in laparoscopic procedures and proper lines of management of this complication.

Methodology

An observational single cohort study was conducted prospectively in the post-anesthesia care unit (PACU) between 7th Oct to 13th Nov in 2018. We included adult patients who

were underwent laparoscopic surgery and admitted after surgery to post-anesthesia care unit to recover from anesthesia at King Abdulaziz Medical City/ National Guard Health Affairs in Riyadh. Patients have to be ASA I and II who took antiemetic intraoperatively in order to be included in this study. ASA stands for American Society of Anesthesiologists which are classified patients depend on their conditions. Class I normal healthy patients such as, healthy, non-smoking, and non-obese (BMI under 30) and class II a patient with a mild systemic disease such as, controlled hypertension, controlled diabetes mellitus, and pregnancy. we excluded all patients with cardiovascular diseases, pulmonary diseases, gastrointestinal diseases, cancer, and patients who take medications that induce emesis. Non-random convenience sampling technique were used in selecting the study population.

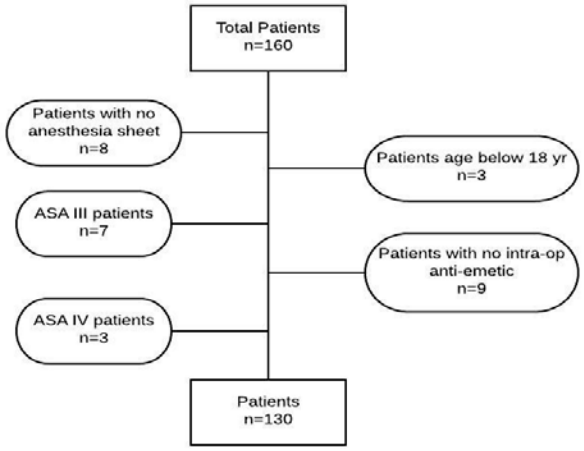
Research instrument:

A questionnaire have been used to collect information from the study participants. The questioner have been developed by experts and panel in anesthesia department . The questionnaire was directed to patients who admitted to post-anesthesia care unit obtaining information about their sense of nausea and vomiting, previous history of post-operative nausea and vomiting, previous laparoscopic procedures, history of anesthesia complication, history of nausea and vomiting, or motions sickness, receiving antiemetic medication and how the patients respond to it, and smoking status. The remaining patient's information were extracted from patients medical file using standardized data collection sheet. The data collection sheet included the following information: patient code number, demographic details such as age, gender, weight, and BMI, basic vital signs on arrival to PACU (heart rate, blood pressure, Spo2, temperature, and pain score), analgesics and antiemetics given in post-anesthesia care unit, and duration of anesthesia and surgery. However, the main variables or data that included in the study results are demographic data, smoking status, motion sickness, previous laparoscopic procedures, history of post-operative nausea and vomiting, history of anesthesia, and history of nausea and vomiting.

The collected data was entered to MS excel sheet and then exported to SPSS version 20 to obtain the results. Chi-Square test was used to find the association between the variables (gender, motion sickness, smoking status, and history of post-operative nausea and vomiting), and the incidence of post-operative nausea and vomiting, and it is presented as percentage and frequencies, whereas the continues variables which are age and BMI were presented as mean and standard deviation (SD).

Results

The whole sample was collected which are 160 patients, but 30 of them were excluded as shown in figure1 because 22 of them haven't met the study inclusion criteria, and 8 of them haven't anesthesia sheet which mean some of their information were missing.



A summary of the demographic data is shown in table 1. The table shows that 39 (30%) of patients who went under laparoscopic procedures were males, and 91 (70%) of them were females (figure2). Figure 2 illustrates that the vast majority of respondents were females 70% , whilst the males were 30%. The mean (± SD) age and BMI of the subject were 41.43(± 13.575) years and 29.35(± 5.533) Kg\m^2 respectively.

Table 1: demographic details of the subject.

Variable		Frequency (percentage)
Gender	Male	39 (30)
	Female	91 (70)
Variable		**Mean ± SD**
Age (year)		41.43 ± 13.575
Body mass index		K29.35 ± 5.533g\m²)

clarifies the personal & medical history. It shows that there were 15 (11.5%) of the patients who went under laparoscopic procedures are smokers and the same number had previous laparoscopic procedure, and only 6 (4.6%) had motion sickness. There were 49 (37.7%) of these patients experienced nausea and vomiting in their normal life, and 1 (6.7%) of these had history of post-operative nausea and

vomiting. The last variable is history of anesthesia complication which no one experienced it.

Table 2: personal & medical history:

Variable	Frequency (percentage)
Smoking	15(11.5)
Motion sickness	6 (4.6)
Previous laparoscopic procedure	15 (11.5)
History of post-operative nausea and vomiting	1(6.7)
History of anesthesia complication	-
History of nausea and vomiting	49 (37.7)

Figure 3 shows the incidence of post-operative nausea and vomiting. There were 17 (13.10%) of patients who went under laparoscopic procedures were nauseated after the surgery, and 4 (3.10%) of them vomited after the surgery. The patients who experienced both post-operative nausea and post-

operative vomiting were 4 (3.10%).

Figure3: Bar diagram showing the incidence of post op nausea and vomiting among the subjects.

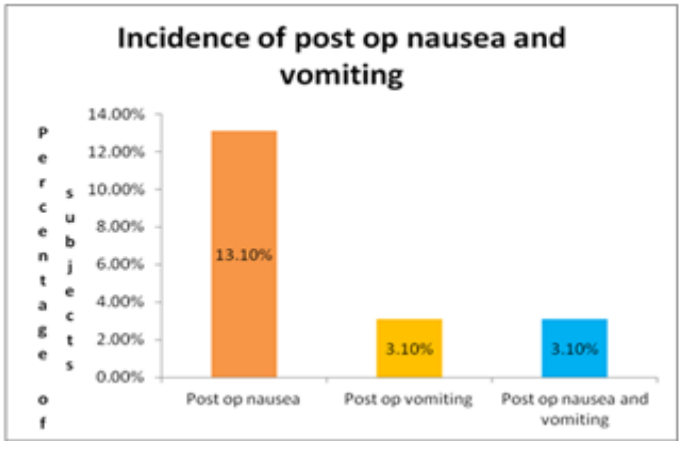


Table 3 gives the relationship between the incidence of post-operative nausea and vomiting with the risk factors. Chi-Square test was used to find the relationship between the variables, and it was found to be statistically insignificant with $P > 0.05$. The table shows that 130 patients, only 4 (100%), all of which were females, experienced PONV, whereas 126 patients did not experience it. 87 (69%) of the latter patients were females, and 39 (31%) of it were males. Of the 130 patients, 15 (11.9%) were smokers and they did not experience PONV, whereas 4 patients were non-smoker experience it, which means there is no relationship between smoking and PONV. Also, there were 6 (4.8%) patients had motion sickness and they did not experience PONV, and 1 (50%) patient had a previous history of post-operative nausea and vomiting, who actually vomited, while 1 (50%) patient had not a previous history of PONV, and also experienced post-operative nausea and vomiting.

Table 3: Risk factors for post-operative nausea &vomiting

Variable	Post-operative nausea & vomiting		Total
	yes	no	
Gender			
Female	4 (100%)	87 (69%)	91 (70%)
Male	-	39 (31%)	39 (30%)
Total	4 (100%)	126 (100%)	130 (100%)
Smoking			
Yes	-	15 (11.9%)	15 (11.9%)
No	4 (100%)	111 (88.1%)	115(88.5%)
Total	4 (100%)	126 (100%)	130 (100%)
Motion sickness			
Yes	-	6 (4.8%)	6 (4.8%)
No	4 (100%)	120 (95.2%)	124 (95.4%)
Total	4 (100%)	126 (100%)	130 (100%)
History of post-operative nausea &vomiting			
Yes	1 (50%)	-	1 (6.7%)
No	1 (50%)	13 (100%)	14 (93.3%)
Total	2 (100%)	13 (100%)	15 (100%)

Discussion

Post-operative nausea and vomiting is a serious complication that frequently associated with laparoscopic procedures. Therefore, this study tests the hypothesis which is adult patients undergoing laparoscopic procedures have a high incidence of post-operative nausea and vomiting in the post anesthesia care unit in National Guard Health Affairs. The result of this study showed that the incidence of post-operative nausea and vomiting was 3.10% which contradicts with the research hypothesis. Also, the

relationship between the variables or the risk factors and the incidence of post-operative nausea and vomiting was found to be statistically insignificant with $P > 0.05$.

A previous study conducted by *Iitomi et al* showd that laparoscopic procedures were associated with a high incidence of Post-operative nausea and vomiting. [9] However, in this study the incidence of post-operative nausea and vomiting was low which contradicts with the previous study. The possible reason for the difference is the anti-emetic medications. In the previous study, the incidence of Post-operative nausea and vomiting was high because intraoperative antiemetics weren't used, whereas in this study all patients were given intraoperative anti-emetics have a low incidence of PONV. In another study, two groups of patients were compared: a group to receive intraoperative antiemetics and a group to receive none. [16] The first group significantly experienced less symptoms of Post-operative nausea and vomiting, similar to this study. [16]

Previous studies showed that there is no significant relationship between the incidence of Post-operative nausea and vomiting and the variables which are motion sickness, history of PONV, and smoking status which consistent with the finding of this study. [9] However, several studies reported that the only variable or risk factor that associated with Post-operative nausea and vomiting was the female gender. [16–18] In their study, the report showed that female gender is the most reliable patient-specific predictor for Post-operative nausea and vomiting, indeed, the incidence of Post-operative nausea and vomiting was two to three times higher in females than males. [16–18] It was shown that females were more susceptible than males by being the majority of the patients who have experienced Post-operative nausea and vomiting. [16–18] In this study, all subjects who experienced the symptoms of Post-operative nausea and vomiting were females only, but the association between the incidence of Post-operative nausea and vomiting and female gender consider to be insignificant with $P > 0.05$.

The strengths of this study include that there is no bias in patient's selection, all patients who underwent laparoscopic procedures and admitted to PACU were selected. Another strength, we use a primary source for collecting the data, the data were taken with direct contact with the patients to obtain accurate information. However, this study has several limitations. First, we couldn't collect the whole sample which is 160, due to limited time and receiving the approval late. Second, some of the data were missing in the BestCare, so we had to ask PACU nurses for a printed sheet for the information which consume more time. Third, the study design that we chose required more time to end up with satisfying results.

Conclusion

In conclusion, the study demonstrates that there is no significant association between the incidence of Post-operative nausea and vomiting and the variables which are motion sickness, history of Post-operative nausea and vomiting, and smoking status , whereas the female gender is the only variable that has an association with the incidence of Post-operative nausea and vomiting, but the association remained insignificant. In addition, the authors found that the incidence of Post-operative nausea and vomiting in adult patients who underwent laparoscopic procedures in National Guard Health Affairs was 3.1% which means the prophylactic measures of the anesthetic techniques that NGHA used was effective. Finally, the recommendation for future research is to pick a big sample size from different institutions to obtain satisfying results. Also, dividing the sample into controlled groups for different types of laparoscopic procedures to identify which type has a high incidence of Post-operative nausea and vomiting.

References

1. Beattie WS, Lindblad T, Buckley DN, Forrest JB. The Incidence Of Postoperative Nausea And Vomiting In Women Undergoing Laparoscopy Is Influenced By The Day Of Menstrual Cycle. Can J Anaesth 1991;38(3):298-302
2. Bhakta P, Ghosh BR, Singh U, Et Al. Incidence Of Postoperative Nausea And Vomiting Following Gynecological Laparoscopy: A Comparison Of Standard Anesthetic Technique And Propofol Infusion. Acta Anaesthesiol Taiwanica 2016;54(4):108-13.
3. Rose DK, Cohen MM, Soutter DI. Laparoscopic Cholecystectomy. The Anaesthetist's Point Of View. Can J Anaesth 1992;39(8):809-15.
4. Jessica Feinleib, MD, Phdlori H Kwan, Mdammar Yamani M. Postoperative Nausea And Vomiting. Uptodate. Available From: Https://Www. Uptodate. Com/Contents/Postoperative-Nausea-And -Vomiting [Cited On 2018 Dec 18]
5. Thompson HJ. The Management Of Post-Operative Nausea And Vomiting. J Adv Nurs 1999;29(5):1130-6.
6. Understanding Nausea And Vomiting. American Cancer Society. Available From: Https://Www.Cancer.Org / Treatment/Treatments-And -Side-Effects/Physical-Side-Effects/Nausea-And -Vomiting/What-Is-It.Html [Cited On 2018 Dec 18]
7. Mishra RK. Textbook Of Practical Laparoscopic Surgery. Jaypee Brothers Pvt 2013.P.67-71.
8. Rosenblatt A, Bollens R, Espinoza Cohen B. Manual Of Laparoscopic Urology. Springer 2008.P.7,21.
9. Postoperative Nausea And Vomiting In Laparoscopic Versus Open Cholecystectomy At Two Major Hospitals In Jamaica. West Indian Med J 2009;58(2).
10. Nursal TZ, Yildirim S, Tarim A, Et Al. Effect Of Drainage On Postoperative Nausea, Vomiting, And Pain After Laparoscopic Cholecystectomy. Langenbeck's Arch Surg ;388(2):95-100
11. Lerman J. SURGICAL AND PATIENT FACTORS INVOLVED IN POSTOPERATIVE NAUSEA AND VOMITING. Br J Anaesth 1992;69:24-32.
12. Wilhelm SM, Dehoorne-Smith ML, Kale-Pradhan PB. Prevention Of Postoperative Nausea And Vomiting. Ann Pharmacother 2007;41(1):68-78.
13. Kovac AL. Prevention And Treatment Of Postoperative Nausea And Vomiting. Drugs 2000;59(2):213-43.
14. Apfel CC, Stoecklein K, Lipfert P. PONV: A Problem Of Inhalational Anaesthesia? Best Pract Res Clin Anaesthesiol 2005;19(3):485-500.