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Comparison of the Occurrence of Nausea and Vomiting Following General and Regional (Spinal) Anesthesia after Inguinal Hernia

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ABSTRACT

Choosing the type of anesthesia in surgery is affected by intervention of many factors including adverse effects associated with anesthesia. Of these factors Post Operative Nausea and Vomiting (PONV) can be mentioned, which is the most common complication anesthesia professionals deal with that sometimes leads to other serious complications. Thus, choosing of appropriate anesthetic technique seems necessary to reduce the harmful effects of nausea and vomiting after surgery. In this study, by determining the most important risk factors, it is tried to identify patients with a high risk of developing PONV for prophylactic treatment and thus improve the quality of care parents receive. A total of 60 patients 20-60 years (30 males and 30 females) and in class 2 or 1 ASA were selected and randomly divided into two equal groups of 30. A group underwent regional anesthesia and the other general anesthesia. After surgery, during the first 24 hours were evaluated patients were analyzed for nausea and vomiting. The data were analyzed in SPSS software and the occurrence of nausea and vomiting in these two methods of anesthesia were compared. A significant difference was observed between the incidence of nausea and gender (P=0.01). Thus, the incidence of nausea after surgery in women was more than in men. However, there was no significant difference between the incidences of nausea, average age, smoking, BMI, blood pressure, and type of anesthesia. Moreover, in this study, according to a review of PONV in patients at the beginning of the recovery, 6 hours and 24 hours later, it was concluded that in the first 6 hours after inguinal hernia repair surgery this complication occurs more. In agreement with previous studies, gender and type of anesthesia are of the risk factors while age and body mass index were not of the main risk factors. About smoking, it appears that the differences between this study results with the majority of papers is due to differences in methods and precision in asking.

Keywords: Nausea and vomiting after surgery, General anesthesia, Regional anesthesia

INTRODUCTION

Approximately 75 million people worldwide get-anesthesia annually[1]. Selecting anesthesia type is influenced by many interventions including patient and physician preference, comorbidities, surgery area, emergency or elective surgery, likelihood of increase in gastric contents, lack of sureness about the ability difficult managing of the air passages during intubation and patient's age[2].

The adverse side effects associated with anesthesia may also affect the choice of anesthetic technique[2]. Of these complications, Postoperative Nausea and Vomiting (PONV) is a significant problem after surgery and is the most common complication that specialists in intensive care deal with in after anesthesia care unit[2-4].

Without prophylactic intervention, PONG occurs in about a third of patients (10%-80%) under general anesthesia and 10% -25% after regional anesthesia (spinal cord)[3]. Of PONV complications are delay in dismissing patients from Post Anesthesia Care Unit (PACU), unplanned hospital admission, increased risk of lung aspiration, wound dehiscence, esophageal rupture, subcutaneous emphysema and pneumothorax and significant morbidity after surgery[3]. In the case of aggravation of the condition of the patient, there is the risk of dehydration and acute renal failure. There is also the risk of dangerous electrolyte abnormalities such as hypokalemia. Therefore, careful selection of appropriate anesthesia seems necessary to reduce the harmful effects of nausea and vomiting after surgery[3]. Each episode of vomiting, 20 minutes delay the discharge from the recovery room[4].

The ability to identify patients with a high risk of developing PONV for prophylactic treatment can significantly improve quality patient care and satisfaction[3]. In addition PONV leads to additional cost of antiemetic therapy for patients[4] and is sometimes so annoying that patients often express it worse pain even after surgery[5]. Intervention for most patients that even without prophylactic will not suffer from PONV symptoms will not be needed. In addition, the current interventions have side effects and also involve cost and inconvenience as well[6]).Therefore, therapeutic interventions, especially therapy combination for patients with a high risk of PONV is of utmost importance.

It is obvious that knowledge of PONV risk factors is necessary for such an action[6,7]. The aim of this study is to identify the most suitable method of anesthesia considering complication incidence of nausea and vomiting after surgery for inguinal hernia therefore important risk factors associated with PONV patients at high risk for this complication are checked so that prophylaxis for proper treatment are done and the imposition of additional costs and unnecessary hospitalizations to the patient are prevented.

PONV is divided into an early variety that happens at maximum of 2 to 6 hours after surgery and the second group is delay symptoms that occur 24 to 48 hrs after surgery. There are findings denoting that being early or late types may be different at least in the pathogenesis.

Therefore, phosphating anesthesia is the main possible cause for early PONV[11-12] and the use of opioids, nausea and vomiting and motion sickness caused by taking patient to hospital or home as the possible causes of late PONV[4].

Nausea and vomiting after surgery can be due to different routes such as toxins within the gastrointestinal tract, toxic or absorbed drugs circulating in the bloodstream that stimulate the vestibular system induction[3].

Whether the type of intravenous drugs used during surgery is related to PONV or not is still debated, but the evidence shows that doses of opioids and not the type of them is of the major factors that predict (or are the reason of) PONV[3].

Most large multivariate studies have shown that the use of opioids doubles the chance of PONV after surgery. In this case, the dose of opioid after surgery is important, and not the type of it. Since nonsteroidal anti-inflammatory drugs the selected type (NSAIDs) 2 have reduced the use of opioids up to 20% to 40% PONV have been declining.

However, regional anesthesia has certainly reduced the incidence of PONV (3). Studies have shown that every 30 minutes increase in surgery increases the risk of PONV to 60% (14). Dehydration is also considered an important factor and hydrating the patient enough can reduce PONV[3].

Most prospective cohort studies have seen female gender (in adults) as the strongest independent prediction factor for PONV, the use of antiemetic therapy, and overall PONV as non-related to anesthesia techniques. Women have a lower threshold for motion sickness and pregnancy vomiting.

The reason for more sensitivity of women to nausea and vomiting remain uncertain, but all remain after menopausal[24, 25]. So far, antiemetic regimens have not been established in children and adolescents[26].

MATERIALS AND METHODS

Among patients undergoing inguinal hernia repair referred to a hospital operating room, of 20-60 years, 60 patients (30 males and 30 females) were selected in class 2 or 1 ASA and randomly divided into two equal groups of 30. NPO in all patients was over 8 hrs and all patients with a history of gastrointestinal problems (Dyspepsia), medication for nausea and vomiting and nausea caused by motion (motion sickness) were excluded.

Of the two groups in the study, one group underwent general anesthesia in a stable and common method, and since the start of induction to intubation and inflation of the cuff of the endotracheal tube were Mask Ventilated by a skilled person so that minimal air passes into the stomach and the other group under regional anesthesia were under a fixed method. All of the above took place under the supervision of an experienced anesthesiologist.

After surgery, patients were studied for nausea and vomiting at the beginning of the recovery, 6 hours, and 24 hrs later. Nausea assessment method is prescribed based on the patient feels and in a four-point scale.

No nausea (none), mild nausea (mild), nausea average (moderate), severe nausea (severe) and severity of vomiting over 24 hours is as no vomiting (none), once (mild), two to three times (moderate) and more than three (severe). In the event of severe nausea or vomiting more than once, patients are treated with 10 mg intravenous metoclopramide.

The data then analyzed by a statistician at SPSS program and the effects of nausea and vomiting in anesthesia were compared, and the incidence of nausea and vomiting in these two types of anesthesia are compared while other patient data such as age, sex, smoking habits, BMI, pressure blood, anesthesia methods were also explored.

Vomiting assessment is based on patient's feeling sick and on a four-point scale: no nausea (none), mild nausea (mild), nausea average (moderate), severe nausea (severe) and vomiting is expressed as: no vomiting (none), once (mild), two to three times (moderate) and more than three (severe).

RESULTS

The mean age of all patients was 40.8 years and the average age of men was 40.4 years and 40.4 in women. In occurrence of nausea in total 50% of patients were without nausea, 20% mild nausea, 23.3% moderate nausea and 7.6% reported severe nausea (Fig.1).

Nausea disease by gender in men was 66.7 no nausea, 16.7% mild nausea, 13.3% moderate nausea and 3.3% had severe nausea (Fig.2).

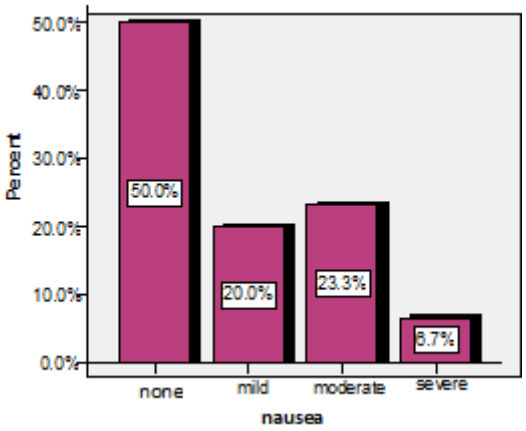

Fig.1: The frequency of nausea in the total patients

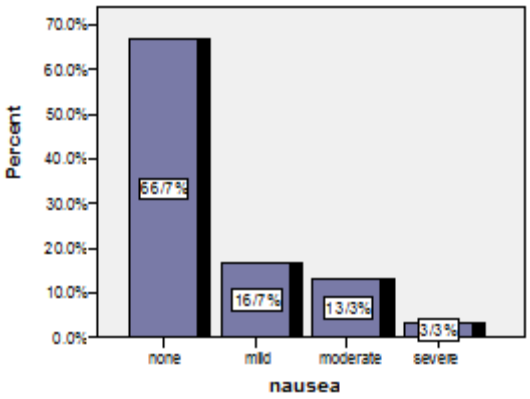

Fig.2: The frequency of nausea in the men patients

In women 33.3% had no nausea, 23.3% mild nausea, 33.3% moderate and 10% had severe nausea (Fig.3).

Regarding the occurrence of nausea by the type of anesthesia in the spinal anesthesia group, 60% of patients were without nausea, 26.7% had mild nausea and 13.3% had moderate nausea. These amounts in general anesthesia group were 40% with no nausea, 13.3% mild nausea and 33.3% had moderate and 13.3 had severe nausea (Figs. 4 &5).

In the case of vomiting, of total patients 56.7% were without vomiting, 18.3% mild vomiting, 21.7% moderate vomiting and 3.3% had severe vomiting (Fig.6).

Vomiting occurrence by sex in men: 70% without vomiting, 20% mild vomiting, and 10% moderate, and in women: 43.3% without vomiting 16.7%, mild vomiting, 33.3% moderate vomiting, and 6.7% had severe vomiting (Figs. 7& 8).

In the case of vomiting by the type of anesthesia in the spinal anesthesia group, 70% of patients were without vomiting, 13.3% mild vomiting, and 16.7% had moderate vomiting

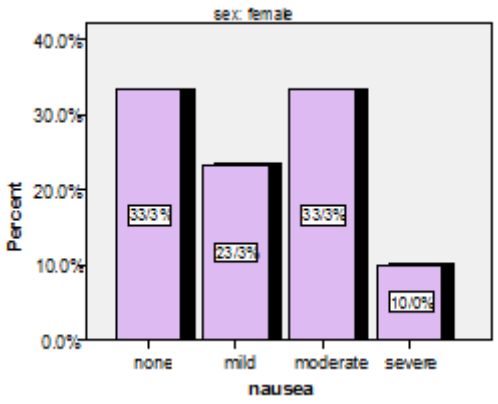

Fig. 3. The frequency of nausea in the women patients

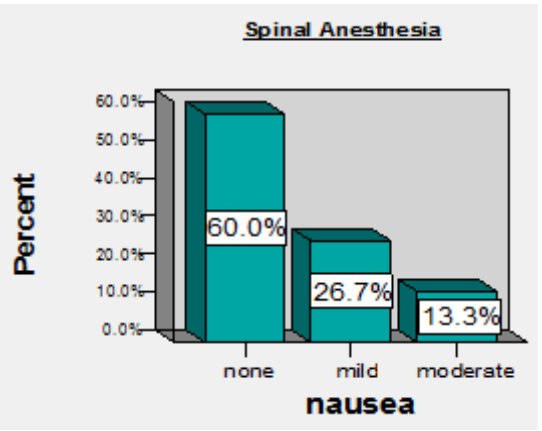

Fig. 4: The frequency of nausea according to anesthesia type in the spinal group

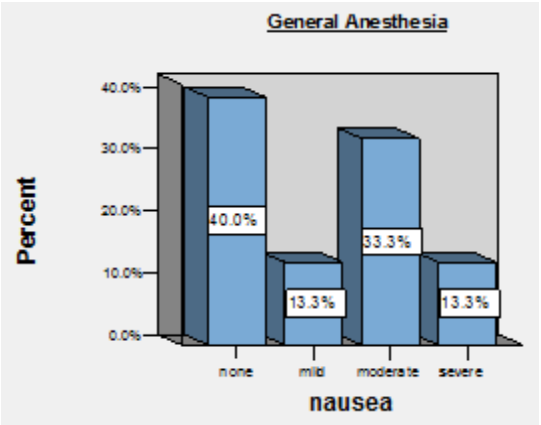

Fig. 5: The frequency of nausea according to anesthesia type in the general anesthesia group

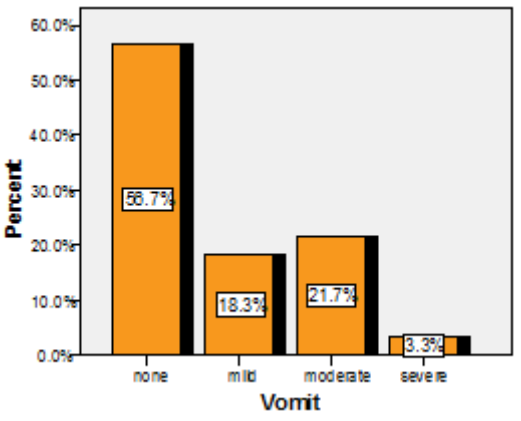

Fig. 6: The frequency of vomit in the total patients

(Fig. 9). These values are the general group was 43.3% without vomiting, 23.3% mild vomiting, 26.7% moderate vomiting and 6.7% had severe vomiting (Fig. 10).

Regarding body mass index of all patients 5% were with low weight, 21.7% normal weight, 60% overweight and 13.3% were obese (Fig. 11). The frequency distribution of body mass index according to the gender in men, 6.7% were with low weight, 30% normal weight, 60% overweight, and 3.3% were obese. In the women 3.3% were with low weight, 13.3% normal weight, 60% overweight, and 23.3% were obese.

In order to compare the mean BMI and nausea and vomiting, T-test was used that due to the results (P = 0.34) and (P= 0.78) were not statistically significant.

Mean blood pressure of patients was 120.77. To compare the incidence of nausea and vomiting with an average systolic blood pressure, T-test did not show a significant difference ((P= 0.23) and (P= 0.28) respectively) (Figs 12, 13).

In this study, although nausea after general anesthesia was more than spinal (60% vs. 40%), this difference was not statistically significant (P= 0.12), this is while there was a significant

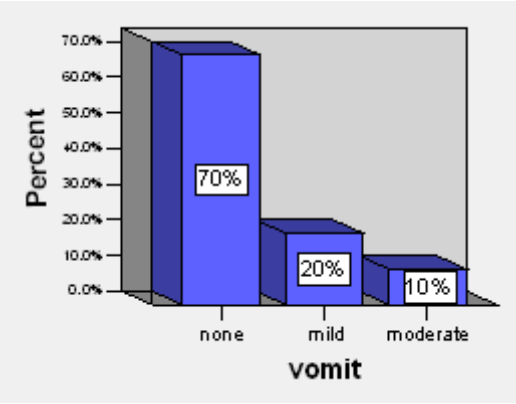

Fig. 7: The frequency of vomit in the male patients

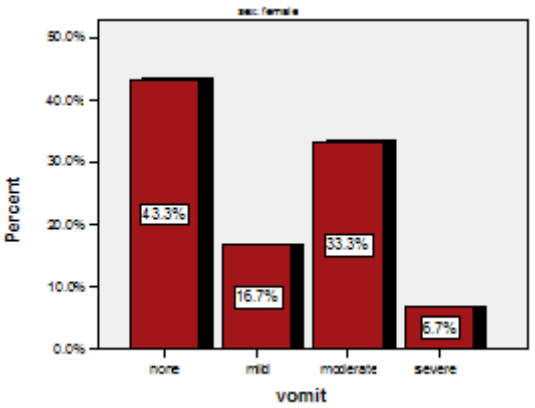

Fig. 8: The frequency of vomit in the women patients

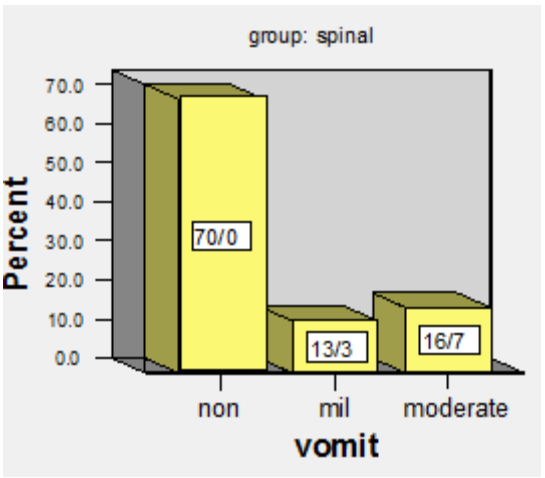

Fig. 9: The frequency of vomit according to the anesthesia type in the spinal anesthesia patients

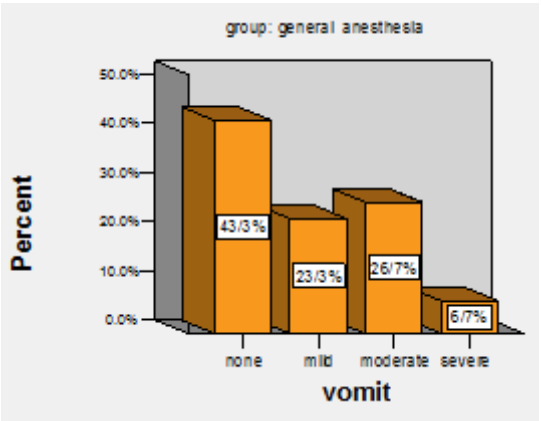

Fig. 10: The frequency of vomit according to the anesthesia type in the general anesthesia patients

difference between vomiting and the type of anesthesia (P= 0.037).

Thus, the incidence of vomiting in the spinal anesthesia was more than in general. These results suggest that the use of regional anesthesia in this surgery can be safer and more convenient regarding nausea and vomiting than general anesthesia. This finding is consistent with the findings of Jellish et al's study that has examined the PONV in laminectomy surgery[22].

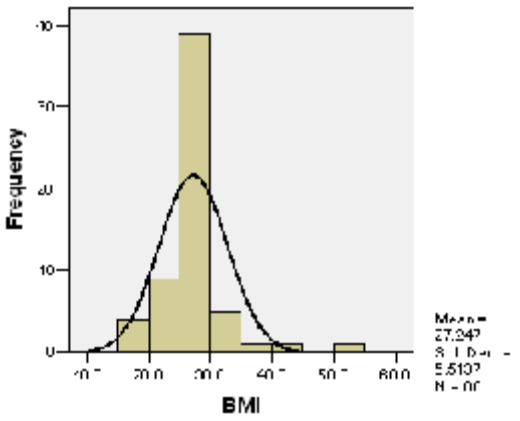

Fig. 11: The frequency distribution of body mass index in all patients

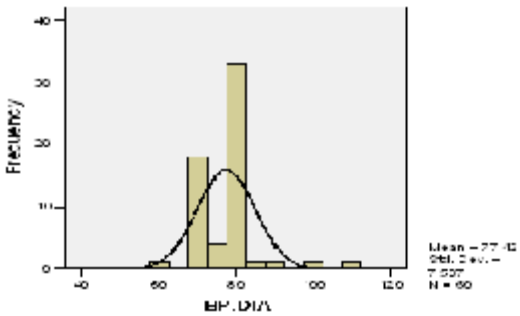

Fig.12. Comparison of frequency of vomit with diastolic blood pressure in the patients

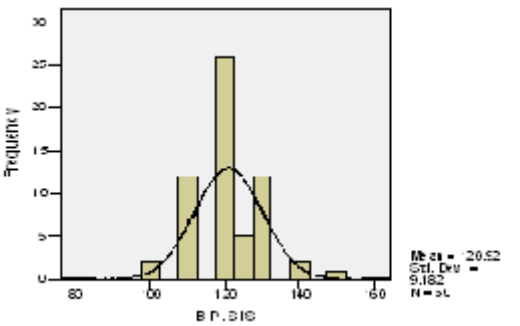

Fig.13: Comparison of frequency of vomit with systolic blood pressure in the patients

In addition, we observed a significant difference between gender and problems of nausea and vomiting. Thus, the incidence of nausea and vomiting after surgery was more in women than in men.

This finding is consistent with results from most studies that took female as the strongest independent predictor of PONV. For example, these findings are consistent with the results of the review by Gan et al who reviewed articles related to PONV between 1990 and 2005[4].

Given that in this study there was no statistically significant relationship between average age and the incidence of nausea and vomiting after surgery, it can be concluded that in this study age is not considered as an independent forecasting factor that may be because in this study, people between 20 and 60 years were studied.

However, Gan et al reported a relationship between age and incidence of nausea and vomiting after surgery.

This relationship was observed in patients ranging in age from childhood and early adolescence. This result does not approve the results of studies denoting that with increase of each decade of age, the risk of PONV decreases 10%[17, 28].

In the present study, although nausea and vomiting after surgery was more in non-smokers than in smokers (40% vs. 53% to 26% versus 48% for nausea and vomiting), no statistically significant correlation was observed between them.

In the study by Whalen et al on the impact of smoking on the incidence of PONV in 2006 on 140 smoking women patients, studying the hypothesis that recent use of cigarettes (24 hrs before surgery) reduces the chance of PONV, showed that there are no direct significant correlations.

In this study, the history of motion sickness/

PONV, the use of antinausea prophylaxis, duration of anesthesia and postoperative use of opioids showed a clear correlation with PONV[29]. These findings are consistent with results of our study, however, at odds with some studies results[16, 29, 30].

Comparing the average BMI and the incidence of nausea and vomiting after surgery in this study showed no significant correlation that is consistent with the results of prior studies that found BMI as a non-influential factor[31].

Given that this study is single-centered and surgeries were performed by different surgeons and under unequal conditions and because the sample size is small, it is recommended that further studies be done in this field in a multi-centered form, and with the same conditions and with a larger sample size, to ensure reliable results.

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