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Post-Operative Nausea, Vomiting and Pain Score in Post Anesthesia Care Unit (PACU) at Jordan University Hospital

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Abstract

A prospective interview based survey on the incidence of postoperative nausea and vomiting of 1007 inpatients aged 1-80 years was conducted during 6 month period. Nausea, vomiting episodes and the need for anti-emetic medication were recorded for 24 hours postoperatively.

The highest incidence of vomiting sequel was observed in neurosurgical patients. The most predictive factors associated with an increased risk for nausea and vomiting were: female gender (51/72), young age 19-35 year old, and body weight 61-80kg.

Keywords: Nausea; Vomiting; Pain score

Introduction

Nausea and vomiting episodes still persist as the most common complaint following anesthesia and surgery, many adults find postoperative nausea and vomiting more distressing than postoperative pain [1]. According to recent reports nausea and vomiting incidence is between 20-30% in the first 24 hours postoperatively after surgery [1-4].

Postoperative nausea and vomiting (PONV) continue to be a common complication of surgery. PONV can lead to increased recovery room time, expanded nursing care, and potential hospital admission for day case surgery patients all factors that may increase total health care costs. Equally important are the high levels of patient discomfort and dissatisfaction associated with PONV [10].

Despite the advance in modern anesthetic practice and surgical techniques there is still room for improvement in identifying the causative factors as well as in prophylaxis and treatment of this problem.

The goal of this audit is to estimate the incidence of postoperative pain score, nausea and vomiting for different types of common surgical procedures. Another aim was also to analyze the predictive factors associated with these symptoms and construct a risk score based on patient related as well as on some anesthetic and surgical factors.

Methods

The study was designed as an observational prospective survey of the incidence of postoperative nausea, vomiting and pain score. We took the approval from our local institutional ethical committee in our department of anesthesia and intensive care.

We collected our data from 11 types of common surgical procedures in different theaters and departments; general surgery, orthopedic, ophthalmology, neurosurgery, otolaryngogical, gynecological and branches of general surgery (plastic, breast, pediatrics).

In patients scheduled to undergo elective surgery requiring general or regional anesthesia and follow up for the first 45 minutes in the recovery room, both genders with ASA status 1-3 were included, but pregnant patients and those requiring intensive care unit were excluded.

General anesthesia included patients didn't receive any pre-medications. All patients were induced with fentanyl as opioid, propofol as hypnotic agent and cisatracurium or rocurounium as muscle relaxant. Morphine as long acting analgesic drug was individually given as needed per case.

All patients were maintained with isoflurane as inhalational agent. Neostigmine and atropine as reversal agents for muscle relaxant were given to each patient received muscle relaxant. Regional anesthesia patients were give bupivacaine (0.5%) 2.5 ml with fentanyl 12-25 μg for intra-thecal analgesia. Postoperatively, patients with APFEL score 1-2 were given metoclopramide, dexamethasone, and ranitidine and for whom APFEL score 3-4 were given ondansetron, dexamethasone and omerprazole. Interviewing study subjects was performed form November 2013-April 2014 all the interviews were conducted by one doctor and all nurses in PACU.

Statistical Analysis

The contribution of potential predictors on the incidence of postoperative nausea and vomiting should be evaluated by logistic regression. Multiple logistic is a commonly used statistical tool that allows the examination of a risk factor for an adverse outcome independently of other covariates associated with the outcome.

Variables that significantly contribute to the variability in the outcome (nausea and vomiting) can be determined by forward stepwise selection and backward deletion [11,12].

Results

The results were shown in Tables 1-11.

Operations	Nausea	Vomiting	Nausea & Vomiting	Total	Percentage (%)
General Surgery	10	12	1	23/211	10.9
Orthopedics	1	5	2	8/141	5.7
Urology	2	3	0	5/98	5.1
E.N.T	0	2	0	2/90	2.2
Plastic	0	4	0	4/45	8.9
Breast	1	1	1	3//27	11.1
Neurosurgery	0	2	0	2/17	11.8
Maxillofacial	0	0	0	0/7	0
Ophthalmology	4	1	0	5//46	10.9
Pediatric	0	0	0	0/73	0
Gynecology	8	8	3	19/252	7.5
Total	26/71	38/71	7/71	71/1007	
%	36.62	53.52	9.86	7.05	

Table 1: Different branches of surgeries and the percentage of nausea and vomiting.

Diseases	Nausea	Vomiting	N&V	Total
Diabetes Mellitus	4	3	0	7
Hypertension	4	5	1	10
Migraine	2	0	0	2
Motion Sickness	0	0	0	0
Hypothyroidism	2	2	1	5
OTHERS	0	2	1	3
Total	12	12	3	27

Table 2: Chronic diseases associated with nausea and vomiting.

Gender	Nausea	Vomiting	N&V	Total	Percentage (%)
Female	21	24	5	50	70.42%
Male	5	14	2	21	29.58%

Table 3: Correlation between nausea, vomiting and gender.

Smoking	Nausea	Vomiting	N&V	Total
Yes	6	6	1	13
No	20	32	6	58

Table 4: Smoking effect on nausea and vomiting.

ASA	Nausea	Vomiting	N&V	Total
I	17	29	5	51
II	7	8	1	16
III	2	1	1	4

Table 5: ASA correlation with nausea and vomiting.

Age	Nausea	Vomiting	Nausea & Vomiting
<1 year	0	1	0
1-5 year	0	2	0
6-12 year	0	4	0
13-18 year	1	1	0
19-35 year	9	11	3
36-50 year	7	11	3
51-75 year	8	8	1
>75 year	1	0	0

Table 6: Age incidence with nausea and vomiting.

Weight	Nausea	Vomiting	Nausea & Vomiting
<10 kg	0	1	0
11-30 kg	0	5	0
31-60 kg	6	8	3
61-80 kg	13	13	4
81-100 kg	5	10	0
>100 kg	2	1	0

Table 7: Weight effect on nausea and vomiting.

Duration	Nausea	Vomiting	Nausea & Vomiting	Total
<30 min	6	5	1	12
31-60 min	11	16	2	29
61-90 min	3	5	2	10
>91 min	6	13	1	20

Table 8: Duration of surgery effect on nausea and vomiting.

Discussion

The current study is a prospective epidemiological survey to get representative numerical estimates of postoperative nausea and vomiting as perceived by the patient for different types of common surgical procedures in a tertiary care hospital setting. The aim was to determine the predictive factors associated with these symptoms and construct a risk score based on patient related as well as on some anesthetic and surgical factors.

Pain Score		
0/10 s	Nausea	1
	Vomiting	0
	Nausea & Vomiting	0
1/10 s	Nausea	3
	Vomiting	5
	Nausea & Vomiting	0
2/10 s	Nausea	12
	Vomiting	21
	Nausea & Vomiting	6
3/10 s	Nausea	5
	Vomiting	8
	Nausea & Vomiting	0
4/10 s	Nausea	1
	Vomiting	3
	Nausea & Vomiting	0
5/10 s	Nausea	2
	Vomiting	1
	Nausea & Vomiting	0
6/10 s	Nausea	1
	Vomiting	0
	Nausea & Vomiting	0
7/10 s	Nausea	0
	Vomiting	0
	Nausea & Vomiting	1
8/10 s	Nausea	1
	Vomiting	0
	Nausea & Vomiting	0
9/10 s	Nausea	0
	Vomiting	0
	Nausea & Vomiting	0
10/10 s	Nausea	0
	Vomiting	0
	Nausea & Vomiting	0

Table 9: Correlation between pain score with nausea and vomiting.

Our findings indicate that the occurrence of nausea and vomiting is 7.05%; the proportion of severe nausea and vomiting was generally below 10% [1-4]. The highest incidence was in neurosurgical patients followed by breast oncology then general surgeries. The highest percentage was in female gender of age between 19-50 years of body weight 61-80 kilograms. Diabetes, hypertension and hypothyroidism as chronic illnesses have the higher incidence of nausea and vomiting. Interestingly non-smokers have higher incidence of nausea and vomiting but we don't encourage smoking in this survey.

	Nausea	Vomiting	Nausea & Vomiting	Total	Percentage (%)
PACU	15	17	2	34	47.887
Ward	8	21	2	31	43.662
Both	2	2	2	6	8.45
Total	25	40	6		
%	35.21	56.34	8.45		

Table 10: Distribution of patient in post-anesthesia care unit (PACU) and in ward with percentage of nausea and vomiting.

APFEL Score	No % Patients	Total Percentage%
0	4	5.6
1	20	28.2
2	33	46.5
3	13	18.3
4	1	1.4

Table 11: Correlation between APFEL score with nausea and vomiting.

Duration of surgery between 31-60 minutes and more than 91 minutes in patients with ASA I have a higher incidence of nausea and vomiting. Although, we found patients were having a higher pain score and given analgesia (such as meperidine), their pain score decreased significantly but they developed higher score of nausea and vomiting.

This study was conducted personally by interviewing all the subjects during the first day of surgery while still in hospital, thus reducing the risk of memory lapse found with subsequently self-completed questionnaires. The intensity of nausea, as perceived by the patient, can be measured only by a subjective scale and the same approach was chosen with pain evaluation [5,6].

In interpreting our results some consideration must be taken into an account, the proportion of gynecological patients contributed to imbalance of gender distribution as well on percentages of results. The incidence of nausea and vomiting after regional anesthesia (mostly spinal) was insignificant than that reported by Carpenter et al [8] but our sample size was too small.

Our survey confirmed as previously mentioned that female gender, a history of previous postoperative emetic sequel and a history of motion sickness as the most important risk factors as in APFEL score [13]. These items were also included in the risk score model of Palazzo Evans [7]. Obesity showed a minor effect on nausea in females [9].

Smokers had a decreased risk of nausea and vomiting, a fact also observed by Cohen et al [3]. This survey has enhanced our awareness of postoperative sickness and the raised the possibility of recognizing the patients at risk for nausea and vomiting pre-operatively could prevent or at least reduce these adverse symptoms. It would be desirable to have a mnemonic attached to the 'ideal' score, something like Abstinence from nicotine, Prior PONV, Female sex, Emesis while travelling, longer than 1 h surgery; as giving APFEL [13].

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