Effect of Educational Program on Prophylactic Antiemetics Prescribing Practice

Zaid M.A. Yousif*, Ayad Ali Hussein*
Department of Clinical Pharmacy and Therapeutics, Faculty of Pharmacy, University of Kufa, Najaf Governorate, Iraq.

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Corresponding Author email:
ph.zaid1987@gmail.com
orcid: https://orcid.org/0000-0002-4704-5631

Abstract:

Background: Post-operative nausea and vomiting (PONV) continues to be among the main concerns after general anesthesia, impacting approximately 30% of all postoperative patients. PONV is still reported by patients as their most distressing post-surgical outcome even surpassing that of pain. In spite of the presence of PONV prophylaxis guidelines and the availability of multimodal and novel anti-emetics, it is clear that these guidelines are poorly applied with insufficient prescription of pre-emptive anti-emetics. This study aimed at evaluating the effect of educational intervention with general surgeons and anesthesiologists on prophylactic antiemetic prescribing practice.

Methods: An interventional study was carried out at Al-Sader Medical City/ Al-Najaf province/ Iraq. In the observational phase of the study, patients were selected from the general surgery ward to observe the baseline prescribing pattern of the prophylactic anti-emetics and PONV incidence among them. After implementing the educational program, another group (interventional group) of patients was taken to see if there was any alteration in the practice of pre-emptive anti-emetics prescription and the incidence of PONV.

Results: Two groups each of 50 patients were enrolled, namely, observational group and interventional group. In the observational group, only 7 patients (14%) received preoperative prophylactic anti-emetics compared to 24 patients (48%) in the interventional group, ($P<0.001$). No statistically relevant difference was observed in the use of post-operative anti-emetics. The incidence of PONV within the first 24 hours was significantly lower among the interventional patients' group, (28%) versus (54%) before the educational intervention, ($P<0.05$).

Conclusion: This study revealed that the educational program done by the researcher has a positive impact on the prescription of pre-operative prophylactic anti-emetics with subsequent reduction in PONV incidence.

Key words: PONV prophylaxis, educational program

تأثير البرنامج التعليمي على الممارسة الوصفية لمضادات القيء الوقائية

زيد محمد علي يوسف، أياد علي حسين
** كلية الصيدلة / جامعة الكوفة – العراق، النجف.*

الخلاصة:

المقدمة: يعد الغثيان والقيء بعد العمليات الجراحية من المخاوف الرئيسية بعد التخدير العام، حيث يؤثر على ما يقارب 30٪ من جميع المرضى بعد الجراحة. لا يزال المرضى يعتبرون الغثيان والقيء بعد العمليات الجراحية من بين أكثر النتائج المزعجة بعد الجراحة حتى تتجاوز الألم. على الرغم من وجود إرشادات الوقاية من الغثيان والقيء بعد العمليات الجراحية وتوافر مضادات القيء الجديدة والمتعددة طرق العمل، من الواضح أن هذه الإرشادات مطبقة بشكل غير جيد مع وصف غير كافي للأدوية المضادة للقيء. هدفت هذه الدراسة إلى تقييم تأثير التدخل التعليمي مع الجراحين العامين وأخصائيي التخدير على ممارسة وصف مضادات القيء الوقائية.

طرق العمل: أجريت دراسة تدخلية في مدينة الصدر الطبية / محافظة النجف / العراق. في مرحلة قبل إجراء التدخل من الدراسة، تم اختيار المرضى من ردهة الجراحة العامة لمراقبة نمط وصف مضادات القيء الوقائية قبل الجراحة ونسبة حدوث الغثيان والقيء بعد العمليات الجراحية. بعد تنفيذ البرنامج التدخلي التعليمي، تم أخذ مجموعة أخرى من المرضى لمعرفة ما إذا كان هناك أي تغيير في ممارسة وصف مضادات الغثيان والقيء الوقائية.

النتائج: تم أخذ مجموعتين من المرضى، وهي مجموعة المراقبة (50) مريضاً ومجموعة التداخل (50) مريضاً. في مجموعة المراقبة، تم وصف مضادات القيء الوقائية ل 7 مرضى فقط (14٪) مقارنة مع 24 مريضا (48٪) في مجموعة التداخل، .لم يلاحظ أي فروق ذات دلالة إحصائية في استخدام مضادات القيء بعد العمليات الجراحية. نسبة حدوث الغثيان والقيء في غضون ال 24 ساعة الأولى كانت أقل بشكل ملحوظ في مجموعة التداخل، (28٪) مقابل (54٪) قبل مجموعة المراقبة.

الأستنتاج: كشفت هذه الدراسة أن البرنامج التعليمي الذي قام به الباحث كان له تأثير إيجابي على وصف الأدوية المضادة للقيء ما قبل العمليات مع انخفاض لاحق في الغثيان والقيء بعد الجراحة.

الكلمات المفتاحية: الوقاية من الغثيان والقيء بعد العملية الجراحية، البرنامج التعليمي.

Introduction:

Nausea is a subjective and annoying feeling causing distress in the stomach and mouth which gives the desire to vomit. It can be accompanied by dizziness, increased salivation, and tachycardia. Vomiting and retching are objective symptoms; vomiting (emesis) involves the forcible expulsion of even little volume of the stomach contents throughout the mouth, and retching denotes to the rhythmic abdominal muscle's contraction with no actual emesis [1].

Post-operative nausea and vomiting (PONV) continues to be among the main concerns after general anesthesia, impacting approximately 30% of all postoperative patients [2]. It usually occurs during the first 24 hour after surgery [3]. PONV is still reported by patients as their most distressing post-surgical outcome even surpassing that of pain [4], and they are ready to pay 100$ to preclude PONV [5].

It is clear that the risk factors for PONV are various and can be classified into patient-specific factors, anesthetic factors, and surgical factors. Patient-specific factors involve female sex, past history of PONV/motion sickness, non-smoking status, and age less than 50 years. Anesthetic factors comprise general anesthesia, nitrous oxide, volatile anesthetics, and postoperative opioids usage. The surgery-related factors involve the type and duration of surgery [6-9]. It is recommended that the baseline-risk is objectively assessed using a well-validated risk score that depends on independent factors; therefore, the choice and usage of pre-emptive anti-emetics can be guided in a risk-adapted way. The two most common used risk scores for PONV prediction in adults are Koivuranta and Apfel. The Apfel scoring system relies on 4 highly predictive factors which are: female, previous history of PONV and/or motion sickness, non-smoker, and probable post-operative opioids use. In the Koivuranta

score, the length of surgery (≥ 60 min) was considered as well as to the 4 prognostic factors depended by Apfel [10]. Guidelines for PONV management were released by numerous societies [11-14]. Nevertheless, the most recent guideline about PONV was produced by the Society for Ambulatory Anesthesia (SAMBA) in 2014. In spite of the presence of PONV prophylaxis guidelines and the availability of multimodal and novel anti-emetics, it is clear that these guidelines are poorly applied with insufficient prescription of pre-emptive anti-emetics [15,16]. The suboptimal administration of preoperative anti-emetics might be related to the inadequate physicians' awareness about the clinical relevance of PONV, and the attitude of managing PONV after its occurrence [10,17]. This study aimed at evaluating the effect of educational intervention with general surgeons and anesthesiologists on prophylactic antiemetic prescribing practice.

Patients and Methods

Study Design:

An interventional study was carried out at Al-Sader Medical City/ Al-Najaf province/ Iraq from January to July 2018. In the observational phase of the study, patients were selected from the general surgery ward to observe the baseline prescribing pattern of the prophylactic anti-emetics and PONV incidence among them. After that, a focused educational program was delivered by the investigator to the general surgeons (26) and anesthesiologists (5) who were practicing at this hospital during the study period. This program involved presenting lectures in small group sessions and placing summarized guideline instructors according to the SAMBA guideline in the operating rooms. That was to make awareness about the latest guideline for PONV prevention and consequently encouraging the prescription of prophylactic anti-emetics. Subsequently, another group of patients were taken to see if there was any alteration in the practice of prophylactic anti-emetics prescription and the incidence of PONV. According to the Apfel score, patients' risk for PONV may be low (those with 0-1 Apfel predictors), moderate (with 3 risk factors), or high (with 4 risk factors) [10].

Study Population and Groups: In both phases of the study, a purpose designed data collection sheet was utilized to obtain patients' information. Data concerning the patients' demographic variables, contact data, medical history, Apfel's predictors, preoperative anti-emetics, and PONV incidence were documented. Eligible patients were adults, undergoing general anesthesia for elective surgical procedure. Patients receiving regional anesthesia, pregnant patients, those on chronic steroids, and those with contraindication to one of the anti-emetics were all excluded from the study. Verbal consent was obtained from all patients.

Group A (**Observational group):** Of 79 patients assessed for eligibility, 50 patients were enrolled in this part.

Group B (Interventional group): Among the 84 patients reviewed for eligibility, 50 patients matched the inclusion criteria and included in this phase.

Statistical Analysis:

The statistical package for social sciences (SPSS) version 25 software for windows was used for data analysis. For categorical variables, chi-square test was used and applied in all comparisons. The level of significance was set less than 0.05 in which the difference considered as significant and of P of less than 0.001 is highly significant.

Results

Patients' Variables

Two groups each of 50 patients were enrolled, namely, observational group and interventional group. As shown in **(Table 1)**, no statistically significant differences had been found between both groups with regards to their demographic variables:

age, sex, smoking, and the others in all comparisons of these variables, (P>0.05). Both patients' groups were corresponded for the same type of surgery. Furthermore, the distribution of Apfel Score and risk class between the two studied patients' groups were statistically insignificant, (P>0.05), **(Table 2)**.

Table (1): Patients' Variables between the Two Patients Groups

Variable		Group A		Group B		P. value
		No.	%	No.	%	
Age (year)	18 – 20	6	12	5	10	0.48 NS
	21 – 30	15	30	10	20	
	31 – 40	10	20	14	28	
	41 – 50	12	24	9	18	
	> 50	7	14	12	24	
Sex	Male	14	28	9	18	0.34 NS
	Female	36	72	41	82	
Smoking history	Smoker	8	16	11	22	0.61 NS
	Non-smoker	42	84	39	78	
PONV history	Yes	13	26	10	20	0.63 NS
	No	37	74	40	80	
History of motion sickness	Yes	12	24	15	30	0.65 NS
	No	38	76	35	70	
Usage of postoperative opioids	Yes	20	40	22	44	0.84 NS
	No	30	60	28	56	
Type of surgery	Laparoscopic surgery	20	40	20	40	1.00 NS
	Breast lump removal	12	24	12	24	
	Umbilical hernia repair	10	20	10	20	
	Thyroidectomy	6	12	6	12	
	Hepatic hydatid cysts removal	2	4	2	6	

- Data expressed as number and percent
- No: number, %: percentage
- NS:Non.Significant
- Chi-square test was used in all comparisons

Table (2): Distribution of Apfel Score among Patients' Groups

	Group A		Group B		P. value
Apfel Score	**No.**	**%**	**No.**	**%**	
Low	7	14	5	10	0.82 NS
Moderate	38	76	40	80	
High	5	10	5	10	
Chi-square test					

- Data expressed as number and percent
- No: number, %: percentage
- NS:Non.Significant
- Chi-square test was used in all comparisons

Pre-emptive Post-operative Anti-emetics Usage

As shown in **(Table3)**, in the observational group, only 7 patients (14%) received preoperative prophylactic anti-emetics compared to 24 patients (48%) in the interventional group, (P<0.001). Although the use of postoperative (rescue) anti-emetics was higher in the observational patients' group compared to those after intervention, 36% vs. 24%, respectively, the difference did not reach statistical significance, (P>0.05).

Table (3): Pre-emptive Post-operative Anti-emetics Used among the Patients' Groups

		Group A		Group B		P. value
		No.	**%**	**No.**	**%**	
Pre-emptive anti-emetics use	**Yes**	7	14.0	24	48.0	<0.001 HS
	No	43	86.0	26	52.0	
Postoperative rescue anti-emetics	**Yes**	18	36.0	12	24.0	0.190 HS
	No	32	64.0	38	76.0	
Chi-square test						

- Data expressed as number and percent
- No: number, %: percentage
- HS:highly Significant
- Chi-square test was used in all comparisons

Postoperative Nausea and Vomiting Incidence

Regarding to the occurrence of PONV within the first 24 hours post-operatively, a statistically significant change, (P<0.05), had been found between the two studied patients' groups. Among the observational patients' group 27 (54%) had PONV

within 24 hours compared to 14 (28%) of patients enrolled after the study intervention, **(Table 4)**.

Table (4): Postoperative Nausea and Vomiting Incidence among the Patients' Groups

	Group A		Group B		P. value
PONV within 24 hours	**No.**	**%**	**No.**	**%**	
Yes	27	54.0	14	28.0	**0.008 HS**
No	23	46.0	36	72.0	
Chi-square test					

- Data expressed as number and percent
- No: number, %: percentage
- HS:highly Significant
- Chi-square test was used in all comparisons

Discussion

Despite the clinical relevance and impact of PONV, poor guideline adherence and suboptimal prescription of the prophylactic anti-emetics is a well-recognized dilemma [16]. This study tried to find out the role of educational program in improving the practice of PONV prophylaxis.

The present study has shown that the educational program done by the researcher has a considerable impact on encouraging the prescription of pre-operative prophylactic anti-emetics as reflected by the finding that (48%) of the patients in the interventional group received pre-emptive anti-emetics compared to (14%) of patients before the study intervention. Additionally, the use of post-operative (rescue) anti-emetics was higher in the observational group than that of the interventional group, (36%) versus (24%) respectively; however, the difference was without statistical significance. This result was in line with a previous study carried out in the U.K which revealed that after enhanced protocol intervention the proportion of prophylactic anti-emetics increased markedly from (36%) to (64%) [18]. Possible reasons for this finding are increased doctors' awareness concerning the PONV outcome and to decrease its incidence besides the probable alteration in their attitude regarding the equivalency between prophylactic and as needed (rescue) approaches. However, these results are not parallel with that demonstrated by a French educational study which showed that the overall prescription of pre-emptive anti-emetics was not remarkably changed among the patient's groups before and after intense educational approaches, (31.4%) versus (36.8%) respectively [19]. The most likely justifications for such dissimilarity could be due to differences in the prescribers' behavior and baseline awareness, and the perceived benefits from PONV prophylaxis. Another interesting result of the current study is the incidence of PONV between the two patients' groups, where PONV occurrence in the interventional patients' group dropped significantly from (54%) before intervention to (28%) after intervention. Similar pattern of results was reported by Sigaut et al., (2010) who stated that an educational method aimed at PONV prediction by means of Apfel's scoring was useful in minimizing PONV incidence [19]. Moreover, this finding is in accordance with a retrospective cohort review performed in U.S which confirmed

that implementing evidence-based PONV prophylaxis strategies produced important reduction in PONV [20]. Reduced PONV incidence rate after the educational program of the present study could be directly associated with the increased use of the prophylactic anti-emetics. On the other hand, a former randomized trial done in the Netherlands revealed that PONV incidence was not significantly reduced despite the increased administration of pre-emptive anti-emetics [21]. This inconsistency might be attributed to differences in the anesthetic drugs and procedures, variations in patients' characteristics and type of surgical procedure.

Limitations of the current study could be linked to the relatively small sample size, and being carried out in a single medical center, therefore, the results cannot be generalized. However, the study was conducted in the biggest hospital in Al-Najaf province.

Conclusion:

This study revealed that the educational program done by the researcher has a positive impact on the prescription of pre-operative prophylactic anti-emetics with subsequent reduction in PONV incidence.

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Study approval

This study was approved by the Scientific Committee of Researches of Al-Najaf Health Directorate (Ref#2018-689).

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