

Comparison of efficacy of Ondansetron and Metoclopramide in reducing Postoperative Nausea and Vomiting

M. Kawin Kumar 

Assistant Professor, Department of Anaesthesiology, Sri Muthukumaran Medical College Hospital and Research Institute, Chennai, Tamil Nadu, India.

Abstract

Background: Post-operative vomiting and nausea are common conditions faced by cases undergoing surgery under general anesthesia. Ondansetron and metoclopramide are the widely used drug which was proved to reduce the post-operative vomiting and nausea but among metoclopramide and ondansetron, the one drug with better efficacy remains a question and hence this study was conducted to assess the same. **Subjects and Methods :** This randomized controlled trial was conducted in the department of anaesthesiology among the patients who underwent surgery in Sri Muthukumaran Medical College Hospital and Research Institute, Chennai from August 2019 to March 2020. A total of eighty cases were included and the study participants were randomized and divided into two groups with forty cases in each group. Patients in group A received the drug Metoclopramide (10 mg) and group B received Ondansetron (4 mg). Outcome assessed were the incidence of nausea and vomiting and the number of doses of additional antiemetics needed. Data was analyzed using SPSS -17. **Results:** There was no statistically significant difference noted between the two groups for age, gender, weight and duration of surgery whereas vomiting and nausea were found to be significantly low in the ondansetron group compared to the metoclopramide group which in turn results in significantly more doses of antiemetics were needed in the metoclopramide group than the ondansetron group during the post-operative period. **Conclusion:** Single dose of preoperative ondansetron helps to significantly reduce postoperative nausea and vomiting compared to metoclopramide.

Keywords: Metoclopramide, Ondansetron, post operative, Vomiting, Nausea

Corresponding Author: M. Kawin Kumar, Assistant Professor, Department of Anaesthesiology, Sri Muthukumaran Medical College Hospital and Research Institute, Chennai, Tamil Nadu, India.

E-mail: chrishanthajoybell@gmail.com

Received: 03 September 2020

Revised: 15 October 2020

Accepted: 23 October 2020

Published: 16 December 2020

Introduction

Postoperative nausea and vomiting (PONV) is an ever ending issue faced by anesthetist among the cases undergoing surgery under general anesthesia. It is a common problem not only with major surgeries but also with even daycare procedures which involves general anesthesia which results in delayed discharge from the hospital.^[1] Causes of postoperative vomiting and nausea are multifactorial which includes the type of surgery performed, the use of different anesthetic agents used, etc.^[2]

Ondansetron is a widely used drug that was proved to reduce postoperative nausea and vomiting.^[3] Apart from treatment modality, it was used as a prophylactic drug for the prevention of vomiting and nausea following some procedures known to be associated with post-operative nausea and vomiting.^[4]

Metoclopramide, another antiemetic drug that was chosen in this study because it is also a widely used antiemetic drug.^[5] This drug possesses the risk of causing extrapyramidal symptoms and sedation when it is used in the treatment of

emesis.^[6]

Ondansetron was proved to be effective following the strabismus surgery,^[7] tonsillectomy and gynecological laparoscopy.^[8,9] These findings were found to be in contrast to the findings of previous studies.^[10,11] Thus this study was planned to assess the real therapeutic insight of ondansetron and metoclopramide during the post-operative period.

Objectives:

To assess the therapeutic efficacy of metoclopramide and ondansetron among the post-operative cases in a tertiary care hospital.

Subjects and Methods

This randomized controlled trial was conducted in the department of anaesthesiology among the adult patients admitted in different surgical departments like General Surgery, ENT, Orthopedics and Gynecology in Sri Muthukumaran Medical

College Hospital and Research Institute, Chennai during the month of August 2019 to March 2020. Patients who were more than 18 years of age and who belong to ASA grade I and II, who underwent elective surgical procedures were included in the study. Patients allergic to metoclopramide and ondansetron, lactating and pregnant mothers and patients who were under antiemetic drugs were excluded from the study. A total of eighty cases were included in this study.

Before the commencement of the study, informed consent was obtained from each participant. The study participants were randomly divided into two groups with forty cases in each group. Patients in group A received the drug Metoclopramide 10 mg intravenously and group B received Ondansetron 4 mg intravenously.

Based on the group to which the participants were randomization, the drug under the study was injected through the intravenous route, slowly. During the postoperative period, the assessment of vomiting and nausea started after the patient was shifted to the recovery room and observed for 24 hours during the post-operative period. Also patient's vital signs were recorded during the same period. The count of episodes of nausea and vomiting (emetic) and a number of doses of additional antiemetics needed during the postoperative period were observed and recorded. Required doses of non-narcotic analgesics during the same period were noted. The data were analyzed using Statistical Package for Social Sciences (SPSS) version 17 and z test and chi-square tests were used appropriately to check the hypothesis. A P-value of less than 0.05 was considered significant.

Results

In this study, among the participants in group A, there were 27.5%, 32.5%, 25%, 10% and 5% of cases belong to age group 19-25 years, 26-35 years, 36-45 years, 46-55 years and 56-65 years, respectively. Similarly in group B, there were 17.5%, 22.5%, 35%, 15% and 10% of cases belongs to age group 19-25 years, 26-35 years, 36-45 years, 46-55 years and 56-65 years, respectively. The mean age of participants in group A and group B was found to be 38.21 ± 11.91 years and 35.82 ± 13.55 years, respectively. In group A there were 60% and 40% of males and female participants, respectively were included whereas in group B there were 47.5% and 52.5% of male and female participants, respectively were included. On assessing the weight of the cases in group A, there were 17.5%, 22.5%, 30%, 17.5% and 12.5% of cases in weight categories of 41-50 kgs, 51-60 kgs, 61-70 kgs, 71-80 kgs and more than 80 kgs, respectively whereas in group B there were 22.5%, 27.5%, 25%, 17.5% and 7.5% of cases in weight categories of 41-50 kgs, 51-60 kgs, 61-70 kgs, 71-80 kgs and more than 80 kgs, respectively. There was no statistically significant difference in the distribution of cases with respect to age, gender and

weight, noted between group A and group B, in this study. [Table 1]

In group A, there were 30%, 22.5%, 25% and 22.5% of cases who underwent surgical procedures in the department of general surgery, gynecology, ear nose and throat (ENT) and orthopedics, respectively whereas in the group B there were 32.5%, 22.5%, 17.5% and 27.5% of cases who underwent surgical procedures in the department of general surgery, gynecology, ENT and orthopedics, respectively. On assessing the mean duration of surgical procedure in group A and group B, 95.5 ± 74.7 minutes and 106.3 ± 61.5 minutes was noted with no statistically significant difference between the two groups ($P=0.4823$) [Table 2]. The proportion of cases with respect to the different duration of surgical procedures is shown in [Figure 1].

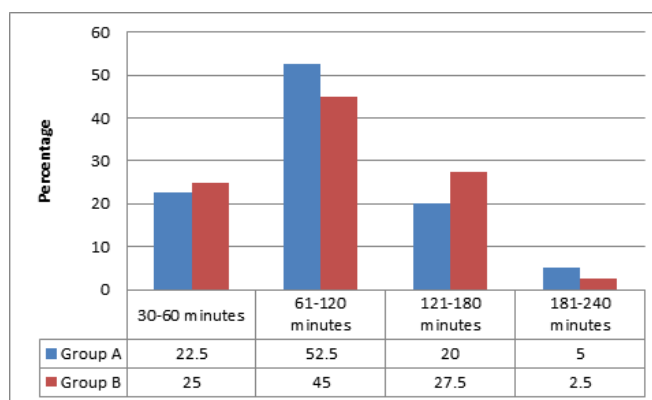


Figure 1: Proportion of cases with a duration of surgery

In the present study, overall 35% of cases from group A were found to have nausea with or without vomiting whereas in group B, overall 12.5% of cases were reported to have nausea with or without vomiting. The difference in the proportion of cases with nausea and with or without vomiting between two groups was found to be statistically significant ($p=0.0188$). There were 20% and 5% of cases with both nausea and vomiting in group A and group B, respectively and the difference in this proportion was found to be statistically significant ($p=0.0438$) whereas the cases with only nausea were reported in 15% and 7.5% of cases in group A and group B, respectively but the difference was found to be statistically insignificant ($p=0.2915$). [Table 3]

The proportion of cases who has one episode of vomiting was 12.5% and 2.5% in group A and group B, respectively and two episodes of vomiting was reported among 5% and 2.5% of cases in group A and group B, respectively whereas 2.5% of cases from group A was found to have three episodes of vomiting. The association between different episodes of vomiting in group A and group B was found

Table 1: Characteristics of the participants in each group

Variables	Group A (n=40) N (%)	Group B (n=40) N (%)	P-value
Age group			
19-25 years	11 (27.5)	7 (17.5)	0.5011
26-35 years	13 (32.5)	9 (22.5)	
36-45 years	10 (25)	14 (35)	
46-55 years	4 (10)	6 (15)	
56-65 years	2 (5)	4 (10)	
Age (Mean \pm SD)	38.21 \pm 11.91	35.82 \pm 13.55	0.4047
Sex			
Male	24 (60)	19 (47.5)	0.2622
Female	16 (40)	21 (52.5)	
Weight			
41-50 kgs	7 (17.5)	9 (22.5)	0.8891
51-60 kgs	9 (22.5)	11 (27.5)	
61-70 kgs	12 (30)	10 (25)	
71-80 kgs	7 (17.5)	7 (17.5)	
> 80 kgs	5 (12.5)	3 (7.5)	
Mean weight (\pm SD)	67.5 \pm 17.14	62.7 \pm 19.45	0.2452

Table 2: Surgical Characteristics of the participants in each group

Variables	Group A N (%)	Group B N (%)	P-value
Surgical departments			
General surgery	12 (30)	13 (32.5)	0.8567
Gynecology	9 (22.5)	9 (22.5)	
ENT	10 (25)	7 (17.5)	
Orthopedics	9 (22.5)	11 (27.5)	
Mean duration of surgery (\pm SD)	95.5 \pm 74.7	106.3 \pm 61.5	0.4823

Table 3: Proportion of cases with nausea and vomiting in each group

Variables	Group A N (%)	Group B N (%)	P-value
Nausea and Vomiting	8 (20)	2 (5)	0.0438*
Nausea alone	6 (15)	3 (7.5)	0.2915
Overall (combined)	14 (35)	5 (12.5)	0.0188*

*Significant

to be statistically insignificant ($p=0.7128$). On assessing the number of antiemetic doses needed 35% and 12.5% of cases needed one or more doses of anti-emetics during the post-operative period from group A and group B, respectively and the association between the numbers of anti-emetic doses needed in group A and group B was found to be statically significant. [Table 4]

Discussion

In the present study, there was no statistically significant difference noted between the two groups with respect to age, gender, weight and duration of surgery whereas vomiting and nausea were significantly low in the ondansetron group compared to the metoclopramide group which in turn results in significantly more doses of antiemetics were needed in the metoclopramide group than the ondansetron group during the

Table 4: Proportion of emetic episodes and antiemetic doses needed in each group

Variables	Group A N (%)	Group B N (%)	P-value
No. of emetic episodes			
One Episode	5 (12.5)	1 (2.5)	0.7128
Two Episodes	2 (5)	1 (2.5)	
Three Episodes	1 (2.5)	0	
No of antiemetic doses needed in postoperative period			
None	26 (65)	35 (87.5)	0.0277*
1-2 doses	6 (15)	4 (10)	
> 2 doses	8 (20)	1 (2.5)	

*Significant

post-operative period.

Inconsistent with the findings of this study, several studies reported that a decrease in the frequency of postoperative vomiting and nausea were reported in the ondansetron group than the metoclopramide group.^[12,13] However the requirement of rescue doses of antiemetics in group A shows that ondansetron provides greater benefit.^[14] Ondansetron was reported to have benefits in terms of less sedation and extrapyramidal effects whereas Metoclopramide is well known to cause sedation and extrapyramidal side effects.^[15,16] Furst et al conducted a study and reported that ondansetron is ineffective when used as a prophylactic drug among the children who underwent craniotomy.^[17] Fabling et al in their study reported that there was no significant reduction in emesis when it is used as a prophylactic among adult cases who underwent supratentorial craniotomy.^[18]

Raphasel JH et al,^[12] reported that 82% and 47% of participants who received ondansetron and metoclopramide, respectively were free of vomiting and nausea, in their study. Similarly, Alon E et al,^[19] reported that incidence of vomiting was 13% and 45% in the ondansetron group and Metoclopramide group, respectively and hence they stated that pre-operative ondansetron is comparatively better and superior to Metoclopramide.

Conclusion

We concluded that ondansetron is highly effective in terms of reducing nausea and vomiting compared to metoclopramide. Also, it was found that there was an increase in additional doses of anti-emetics required in the metoclopramide group than ondansetron group during the postoperative period. Thus a single dose of pre-operative ondansetron helps to significantly reduce vomiting and nausea and also it reduces the postoperative distress which is caused in terms of nausea and vomiting.

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How to cite this article: Kumar MK. Comparison of efficacy of Ondansetron and Metoclopramide in reducing Postoperative Nausea and Vomiting. *Acad. Anesthesiol. Int.* 2020;5(2):66-70.

DOI: [dx.doi.org/10.21276/aan.2020.5.2.14](https://doi.org/10.21276/aan.2020.5.2.14)

Source of Support: Nil, **Conflict of Interest:** None declared.