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ORIGINAL ARTICLE

Decrease in Incidence of PONV by using Ondansetron as Preemptive Antiemetic Agent in Liver Donors

RIFFAT SAEED[1], AMER LATEF[2], SYED MEHMOOD Ali[3], TARIQ BANGHASH[4], IRFAN ALI[5], KHAWAR SHAHZAD[6], MUHAMMAD SARWAR[7], SABIN SHAHJEHAN[8]

[1]*Assistant Professor Anesthesia, Sheikh Zayed Hospital, Lahore*
[2]*Associate Professor of Hepatobiliary, Sheikh Zayed Hospital, Lahore*
[3]*Associate Professor Anesthesia, Sheikh Zayed Hospital, Lahore*
[4]*Associate Professor of Hepatobiliary, Sheikh Zayed Hospital*
[5]*Consultant Anaesthetist, Sheikh Zayed Hospital, Lahore*
[6]*Assistant Professor, Sheikh Zayed Hospital, Lahore*
[7]*Consultant Anaesthetist, Sheikh Zayed Hospital, Lahore*
[8]*Consultant Anaesthetist, Sheikh Zayed Hospital, Lahore*
Correspondence to Dr. Riffat Saeed Email: riffatsaeeddr@gmail.com, Cell: +92 302 4615150

ABSTRACT

Objective: To determine the role of preemptive ondansetron in reducing the incidence of post-operative nausea and vomiting in liver donors.

Design of the Study: It was a randomized controlled trial.

Study Settings: This study was carried out at Department of Anaesthesia and Hepatobiliary Unit, Sheikh Zayed Hospital Lahore from August 2017 to August 2019.

Material and Methods: The study involved 100 male and female patients undergoing surgery for liver donation. These patients were randomly allocated into two arms. Subjects in the experimental group received a single pre-emptive dose of ondansetron before surgery. Outcome variable was incidence of post-operative nausea and vomiting as compared to controls. A written informed consent was obtained from every patient.

Results of the Study: The mean age of the patients was 34.8±9.4 years. We observed a male predominance among these patients with male to female ratio of 1.9:1. The frequency of post-operative nausea (18.0% vs. 36.0%; p-value=0.043) and vomiting (6.0% vs. 24.0%; p-value=0.012) was significantly lower in patients receiving pre-emptive ondansetron.

Conclusion: Preemptive administration of ondansetron substantially reduced the incidence of post-operative nausea and vomiting in patients undergoing surgery for liver donation which advocates preferred use of prophylactic ondansetron among such patients in future practice of donor liver transplant anaesthesia.

Keywords: Liver Donors, Post-Operative Nausea, Post-Operative Vomiting, Ondansetron

INTRODUCTION

Nausea and vomiting in the post-operative period is a common complaint and results from multiple factors related to anesthesia, surgery and the primary condition necessitating the surgery itself.[1] As for post-operative pain, the psychological effects of nausea and vomiting in the post-operative patients lasts longer than immediate post-operative period and are major contributor of patients dissatisfaction and delayed recovery.[1,2] In a number of surveys and interviews conducted on post-operative patients, post-operative nausea and vomiting (PONV) was persistently categorized higher than a number of other post-operative concerns and complications including post-operative pain.[3] Though vomiting appears to be of greater risk and concern, it is important that the discomfort and subsequent immobility resulting from nausea should not be underestimated.[1,3] Patients undergoing general abdominal surgery are already prone for prolonged bed rest and delayed mobilization therefore this PONV among such patients is not that much of a concern as compared to patients undergoing surgery for organ donation which are otherwise healthy and anticipate an uneventful and speedy recovery and discharge.[4,5,6] Therefore prophylaxis and prevention of PONV among such patients becomes much more important and demands active research in this regard.

Ondansetron is a 5-hydroxytryptamine 3 (5-HT3) receptor antagonists which have been widely used for the treatment of PONV.[7] However, its preemptive role in the prevention of PONV is under estimated where only few studies evaluated the incidence of PONV after prophylactic ondansetron administration before surgery.[8-10] We conducted this trial to evaluate the role of preemptive ondansetron in reducing the incidence of post-operative nausea and vomiting in liver donors.

MATERIAL AND METHODS

This was an RCT (randomized controlled trial) which was carried out at Department of Anaesthesia and Hepatobiliary Unit, Sheikh Zayed Hospital Lahore from August 2017 to August 2019. Sample size of 100 patients was calculated with 95% level of significance and 80.0% power of test using expected frequency of post-operative vomiting to be 27.5% with and 55.0% without preemptive ondansetron.[11] Patients of both genders with ages in the range of 18-50 years undergoing elective surgery for liver donation were included. Those with deranged liver and renal functions and history of previous abdominal surgery were excluded. These patients were segregated indiscriminately into two treatment arms. Patients in both the groups received ranitidine and metoclopramide as routine prophylaxis

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against PONV. Patients in the experimental group received additional preemptive ondansetron before surgery. Following surgery, patients received standard post-operative care and were monitored for the incidence of PONV in the first 24 hours. All this information was recorded in a predesigned proforma along with age and gender of the patient. Age has been described by mean ±SD while gender and incidence of PONV have been described by frequency and percentage. Chi-square test has been used to compare the incidence of post-operative nausea and vomiting between the experimental and control groups considering p≤0.05 as significant.

STUDY RESULTS

The mean age of the patients was 34.8±9.4 years (ranged from 18 to 50 years). We observed a male predominance among these patients with male to female ratio of 1.9:1 as shown in Table 1. Both the study groups were comparable in terms of age and gender as shown in Table 2. The frequency of post-operative nausea (18.0% vs. 36.0%; p-value=0.043) and vomiting (6.0% vs. 24.0%; p-value=0.012) was significantly lower in patients receiving pre-emptive ondansetron as shown in Table 3.

Table 1: Demographic features of study cohort

Characteristics	Participants n=100
Age (years)	34.8±9.4
Gender	
• Male	65 (65.0%)
• Female	35 (35.0%)

Table 2: Demographic features of study groups n=100

Characteristics	Ondansetron n=50	Controls n=50	P-value
Age (years)	35.2±9.2	34.4±9.7	0.697
Gender			
• Male	33 (66.0%)	32 (64.0%)	0.834
• Female	17 (34.0%)	18 (36.0%)	

Observed difference was statistically insignificant on independent sample t-test and chi-square test

Table 3: Comparison of incidence of post-operative nausea and vomiting between the study groups n=100

Study Outcome	Ondansetron n=50	Controls n=50	P-value
Post-Operative Nausea			
• Yes	9 (18.0%)	18 (36.0%)	0.043*
• No	41 (82.0%)	32 (64.0%)	
Post-Operative Vomiting			
• Yes	3 (6.0%)	12 (24.0%)	0.012*
• No	47 (94.0%)	38 (76.0%)	

*Observed difference was statistically significant on chi-square test

DISCUSSION

Along with pain, nausea and vomiting in the post-operative period continue as a distressing complication of anesthesia and surgery and adversely affects the post-operative recovery of the patient.[12] The incidence of post-operative nausea and vomiting is further added by the need of post-operative analgesics which are frequently opioids and promote PONV.[12,13] In general surgical practice, these adverse events of anesthesia and surgery are partially bearable owing to overall debilitating condition of the patient undergoing surgery, but are potentially dissatisfying and unacceptable in liver donors who are otherwise healthy and prefer early return to work.[10] Therefore the aim of the current study was to evaluate the role of preemptive ondansetron in minimizing the incidence of post-operative nausea and vomiting among liver donors.

In the present study we found that prophylactic administration of ondansetron prior to surgery significantly reduced the occurrence of PONV as compared to controls. Our observation is in line with a similar previous study where Zhang et al.[11] (2013) evaluated the role of ondansetron in patients undergoing laparoscopic gynecological surgery and reported that ondansetron considerably reduced the incidence of post-operative nausea (30.0% vs. 55.0%; p-value<0.05) and vomiting (27.5% vs. 55.0%; p-value<0.05) as compared to controls. In another similar trial conducted in patients undergoing general abdominal surgery, Yu et al.[14] (2015) also reported similar reduced incidence of vomiting after prophylactic administration of ondansetron (27.5% vs. 50.0%; p-value<0.05) . Similar beneficial effect of preemptive ondansetron has also been reported by Sinha et al.[15] in 2004 (20.0% vs. 60.0%; p-value<0.05) and Larijani et al.[16] in 1991 (22.0% vs. 72.0%; p-value<0.001) in terms of post-operative vomiting.

The present study is first of its kind and evaluated the role of preemptive ondansetron in preventing post-operative nausea and vomiting in healthy liver donors. The strengths of the present study were its large sample size of 100 cases and a randomized study design. We also followed strict exclusion criteria to minimize bias. In the light of results of the present study, we encourage routine administration of ondansetron prophylactically in patients undergoing surgery for organ donation to minimize the likelihood of post-operative nausea and vomiting which will augment the post-operative recovery and improve the patient's satisfaction. Such a study is highly recommended in future clinical research.

CONCLUSION

Preemptive administration of ondansetron substantially reduced the incidence of post-operative nausea and vomiting in patients undergoing surgery for liver donation which advocates preferred use of prophylactic ondansetron among such patients in future practice of gastroenterology.

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