

Comparison of Ondansetron and Metoclopramide in the Prevention of Post-Operative Nausea and Vomiting after Laparoscopic Cholecystectomy

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ABSTRACT

Aim: To compare the efficacy of ondansetron and metoclopramide in the control of post-operative nausea and vomiting after laparoscopic cholecystectomy and to record side effects of either drug.

Method: The study was carried out from 2007 to 2008 in the Department of Anaesthesia, Mayo Hospital, Lahore. Sixty female patients were divided into two groups of 30 each. Group O (ondansetron) was given injection ondansetron 2mg intravenously before induction. Group M (metoclopramide) was given inj metoclopramide 10mg slow intravenously before induction. The parameters like postoperative nausea and vomiting were measured at 12 hours post operatively.

Results: In group O nausea was seen in 11(36.7%) patients and in group M it was seen in 17 (56.7%) patients. Severity of nausea was less in group O as compared to group M. Postoperative vomiting occurred in 12 (40%) patients in group O, 16 (53.33%) patients in group M. Severity of vomiting was also less in group O than M.

Conclusion: Ondansetron was found to have better anti-emetic efficacy when compared with metoclopramide in control of PONV after laparoscopic cholecystectomy.

Key words: Postoperative nausea and vomiting, Ondansetron, metoclopramide.

INTRODUCTION

Postoperative nausea and vomiting (PONV) are distressing and frequent events of anaesthesia and surgery, with a relatively high incidence after laparoscopic cholecystectomy^{1,2,3,4}. Moreover, it was found in various studies that females undergoing laparoscopic cholecystectomy were more susceptible to postoperative nausea and vomiting⁵. PONV can cause prolonged post-anaesthesia care unit (PACU). Stay and unanticipated admissions following ambulatory surgery, therefore, increase medical costs⁶. Nausea and vomiting are also amongst the most unpleasant experiences associated with surgery and one of the most common reasons for poor patient satisfaction rating in the postop period⁶.

Metoclopramide [which has a dose-dependent action on central dopaminergic D2 receptors, central and peripheral 5-HT₃ receptors, and peripheral 5-HT₄ receptors], has been one of the most popular antiemetic for decades.⁷ It is still used widely in clinical practice for the prevention of postoperative nausea and vomiting, although conflicting results are present^{8,9}.

Ondansetron, which was thought to represent the first universally effective anti-emetic for postoperative nausea and vomiting, was shown to have a role in preventing of PONV. However, the

high cost of ondansetron has been a major constraint in its routine prophylactic use¹⁰. Dexamethasone also was used as a stand alone drug in both pediatric and adult patients undergoing surgery^{10,11,12}.

The study was performed in order to compare the efficacy of ondansetron to that of metoclopramide and placebo in prevention of postoperative nausea and vomiting after laparoscopic cholecystectomy^{13,14}.

So, 5-HT₃ receptor antagonists were found highly efficacious whenever their effects were compared with routine anti-emetics in the prevention of post-operative nausea and vomiting associated with laparoscopic cholecystectomy

PATIENTS AND METHODS

The study was carried out from 2007 to 2008 in the Department of Anaesthesia, Mayo Hospital, Lahore. Sixty female patients having ASA status I and II scheduled for elective laparoscopic cholecystectomy were included in the study. All patients were randomly divided into two equal groups; group O and group M. **Group-O:** 30 patients were given injection ondansetron 2mg/ml intravenously before induction. **Group-M:** 30 patients were given injection metoclopramide 10mg/2ml intravenously before induction.

All patients were given general anaesthesia and whole anaesthesia record was maintained. Induction of anaesthesia was done with injection propofol 1.5mg/kg followed by injection atracurium 0.6mg/kg

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for intubation. Complete record of anaesthesia technique, the drug used and postoperative nausea and vomiting was maintained for 24 hours. The end points evaluated were frequency of nausea, intensity of nausea from mild to severe, frequency of vomiting and need for rescue anti-emetics. These parameters were measured after surgery 12 hr postoperatively.

The collected data was entered into SPSS version 10.0 and analyzed. The comparison between group O and M in time of first episode of nausea, postoperative nausea and vomiting was analyzed by using t-test as test of significance. P value <0.05 was considered as significant.

RESULTS

In our study, the incidence of vomiting in group O was in 12 (40.0%) patient. In group M in 16 (53.3%) patients had vomiting episodes. The incidence of nausea in group O was in 11 (36.7%) patients, group M it was in 17 (56.7%) patients.

On comparison of frequency of nausea between group O and M, P value was 0.12, which was statistically not significant.

On comparison of frequency of vomiting between group O and M, P value was 0.3, which was statistically not significant. Intensity of nausea and vomiting were less severe in group O than group M.

Table 1: Comparison of mean age

Group	Mean \pm SD
Ondansetron (Group-O)	40.03 \pm 12.75
Metoclopramide (Group-M)	38.43 \pm 12.79

P>0.64 (Not significant)

Table 2: Comparison of nausea

Nausea	Group O(n=30)	Group M (n=30)
Yes	11(36.7%)	17(56.7%)
No	19(63.3%)	13(43.3%)

Chi square=2.411, P value = 0.12

Table 3: Comparison of vomiting

Vomiting	Group O(n=30)	Group M (n=30)
Yes	12(40%)	16(53.3)
No	18(60%)	14(46.7%)

Chi square=1.071, P value =0.30

DISCUSSION

The incidence of post-operative nausea and vomiting (PONV) depends on the type of anaesthesia and surgery, but overall is estimated to be 20-30%². The incidence of nausea and vomiting has been shown to be 25-42% with no anti-emetic treatment in patients undergoing laparoscopic cholecystectomy². Recently 5-HT₃ receptor antagonist especially ondansetron have been found useful in controlling post-operative nausea and vomiting.

The frequency of nausea was significantly higher in group A (31.2%) compared to group B (14%) at 12 hours postoperatively (P<0.01). However, patients of group A had significantly lower nausea scores at 3 hours post-operatively compared to group B. Postoperative vomiting occurred in 13.8% of patients in group A and 9.6% of patients in group B throughout the whole study period. So conclusion was that ondansetron may be more effective in controlling nausea intensity during the first 3 hours after laparoscopic cholecystectomy, while ondansetron has a longer acting activity, with a major impact on nausea frequency at 12 hours postoperatively¹⁵.

In our study, the incidence of vomiting in group O was 40%, in group M was 53.3%. Intensity of vomiting episodes was less in ondansetron than metoclopramide. As compared with the study of Biljin et al⁵ the incidence of vomiting in group O and M was 5% respectively, which is much less from our study.

In our study incidence of nausea in group O was 36.7%, in group M it was 56.7%. Intensity of nausea judged by a rating scale from mild to severe was also less in ondansetron group than metoclopramide group. As compared with the study of Biljin et al⁵ the incidence of nausea in group O was 25% and in group M was 30% comparable with our study.

Melkkila et al studied a comparative, placebo controlled study in patients undergoing ophthalmic surgery comparing ondansetron with metoclopramide in prevention of PONV. One hundred and twenty patients undergoing elective ophthalmic surgery under general anaesthesia, were investigated in a randomized, double blind parallel group study of post-operative nausea and vomiting. Patients received ondansetron 0.1mg/kg, metoclopramide 0.25mg/kg or placebo given at the end of anaesthesia. In comparison with placebo, ondansetron significantly reduced the degree of nausea (P<0.01) whereas metoclopramide reduced both nausea (<0.05) and vomiting (P<0.05). There were no statistically significant difference between the two active agents in their efficacy to PONV. The patients in the placebo group required rescue anti-emetics more after in the post anaesthesia care unit (PACU)¹⁶.

In our study, the incidence of vomiting in group O was 40%, in group M was 53.3%. Intensity of vomiting episodes was less in ondansetron than metoclopramide. Incidence of nausea in group O was 36.7%, in group M it was 56.7%. Intensity of nausea judged by a rating scale from mild to severe was also less in ondansetron group than metoclopramide group. On comparison of nausea between group O and M, P value was 0.12 which was non significant.

In our study on comparison of vomiting between group O and M, P value was 0.3, which was not

significant. Intensity of nausea and vomiting was less severe in ondansetron group than other group.

In another study by Muhammad and Abbas in which ondansetron was compared with metoclopramide in controlling PONV in patients undergoing minilaparotomy cholecystectomy. Fifty consecutive patients of all ages and both sexes who had simple cholelithiasis and underwent minilaparotomy cholecystectomy were included in a randomized prospective, controlled trial. PONV was recorded at 2 hours at 24 hours and requirement of rescue anti-emetics. Ondansetron was found better than metoclopramide in controlling PONV. It also reduces the need for rescue anti-emetic significantly^{17,18}.

Jokela and Korvuranta conducted a randomized, prospective, double blind trial in which 120 female patients received ondansetron 5mg or droperidol 1.25mg intravenously at the beginning of surgery. Nausea, emetic episodes and the need for rescue medications were recorded for 24 hours postoperatively. Nausea was experienced by 55% of the patients in the ondansetron group and by 62% in the droperidol group. The incidence of emetic episodes was 20% and 52% (P 0.001) in the two groups, respectively. Rescue anti-emetic medication was needed in 42% and 50% of the patients respectively. So conclusion was that ondansetron, when compared with droperidol, had no better efficacy on the prevention of postoperative nausea but resulted in a significantly lower incidence of vomiting after laparoscopic cholecystectomy^{19,20}.

So ondansetron, whenever compared with traditional anti-emetics was found to be highly effective in the prevention of postoperative nausea and vomiting.

So after all this discussion and consultation of results from different studies it is concluded that 5-HT₃ receptor antagonists such as ondansetron has been shown to be more effective in the control of PONV than metoclopramide especially after laparoscopic cholecystectomy.

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