

Efficacy comparison of ondansetron with dexamethasone in preventing nausea and vomiting in post laparoscopic surgeries

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ABSTRACT

Background: Incidence of post operative nausea and vomiting is high following laparoscopic surgeries. It is a major cause of morbidity and extended hospital stay. A considerable number of drugs are used for managing PONV with fewer side effects.

Aim: To compare the effects of intravenous Ondansetron and Dexamethasone to prevent PONV following laparoscopic surgeries.

Methods: This is a prospective, double blind study comprising 50 patients between 15-50 yrs and ASA grade I and II scheduled for laparoscopic surgery under general anesthesia. Patients were randomly divided into Group O (Ondansetron 4mg iv) and Group D (inj.Dexamethasone 8mg iv). The drug was given half an hour prior to surgery. All the vital parameters of patients were observed during intraoperative and postoperative period for next 24 hrs; episodes of nausea, vomiting or retching and any other side effects were evaluated on a 3 -point ordinal scale. Rescue antiemetic was administered if the patient had 2 or more episodes of emesis.

Results: Incidence of nausea and vomiting as well as rescue drug requirement was higher in group D as compared to group O.

Conclusion: Efficacy of Ondansetron was found better than Dexamethasone with lesser side effects.

Keywords: laparoscopic surgery, post-operative nausea and vomiting, PONV, ondansetron, dexamethasone

INTRODUCTION

Post-operative nausea and vomiting (PONV) after laparoscopic surgeries under general anesthesia (G.A) are one of the frequent causes of prolonged hospital stay in day care surgery. Although it is self-limiting however, it can cause significant morbidity including dehydration, electrolyte imbalance, suture tension and wound dehiscence, venous hypertension and bleeding, oesophageal rupture and life threatening airway compromise.¹

Many drugs are used for management of PONV but few of them have side effects like sedation, dysphoria, extrapyramidal symptoms, dry mouth, restlessness and tachycardia.² 5HT₃ receptors antagonists are devoid of such side effects. Ondansetron and Dexamethasone are commonly used drugs from this group to prevent PONV.^{3,4}

In our study, we used intravenous Ondansetron 4mg and compared its effect with intravenous Dexamethasone 8mg to prevent PONV following elective laparoscopic surgeries under G.A.

MATERIALS AND METHODS

This prospective, randomized, double blind study was carried out after approval from institutional ethics committee in 50 patients of age group 15-50 years and ASA physical status of grade I and II scheduled for various elective laparoscopic procedures under general anesthesia in a tertiary care hospital at Bhavnagar, Gujarat. Patients with history of diabetes mellitus, allergic to local anaesthetics, acid peptic disorders, hepatic disorders, and history of PONV or taking antiemetic medication were excluded from the study.

After pre-anaesthetic evaluation and investigations, the patients were explained about the procedure and informed written consent was obtained. Standard pre-operative procedure was followed and baseline vital parameters were recorded. They were pre-medicated with inj. Diclofenac 1.5 mg/kg, inj Ranitidine 1mg/kg, inj. Glycopyrrolate 4mcg/kg iv half an hour before surgery and randomly allocated into two group; Group O and Group D. Inj Ondansetron 4 mg and

inj Dexamethasone 8mg iv was administered respectively half an hour prior to surgery. After pre-oxygenation with 100% oxygen, induction was done with inj sodium thiopentone 5 – 7 mg/kg iv and endotracheal intubation was facilitated by using inj. Succinylcholine 2mg/kg. Gastric distention during induction was avoided by using low airway pressure ventilation after the muscle relaxant had begun to take effect. Intubation was done with appropriate sized portex cuffed endotracheal tube. After checking bilateral air entry, patients were placed on controlled ventilation. Anaesthesia was maintained with oxygen 50 % + N₂O 50% and halothane/isoflurane with inj. Vecuronium bromide 0.08 mg/kg iv as a non-depolarising muscle relaxant. Non-invasive monitoring continued intraoperative through ECG, SpO₂, NIBP, ETCO₂ and peripheral nerve stimulator.

After completion of surgery the neuromuscular blockade was reversed with inj. neostigmine 0.04 – 0.06mg/kg and inj. glycopyrrolate 8µg/kg IV. Patients were extubated after recovery of active oropharyngeal reflexes. Vital parameters, duration of surgery and anesthesia were recorded. Patients were observed for next 24 hrs in the recovery room and ward for any episodes of nausea and vomiting or retching which were evaluated on a 3 point ordinal scale. Rescue antiemetic (inj Metoclopramide 10 mg IV) was given if the patient had 2 or more episodes of emesis and was also recorded. All the patients were observed for side effects such as drowsiness, sedation, muscle pain, constipation, diarrhea or extrapyramidal reaction and treated accordingly upto 24 hrs.

Data were analyzed using unpaired “t” test and p value < 0.05 was considered statistically significant. Data was presented as mean ± standard deviation and percentage.

RESULTS

The demographic data with respect to age, sex, height and weight were comparable in both the groups (Table-1). There was no statistically significant difference in respect to duration of surgery and duration of anesthesia in both the groups.

Table 1. Patient's characteristics and duration of surgery and anesthesia

Parameters	Group- O N-25	Group N-25	p value
Mean age (year)	35.28±11.63	36.64 ± 9.78	> 0.05 (NS)
Sex (M:F)	52%:48%	52%:48%	
Weight (kg)	58.88 ± 5.80	55.6± 7.15	> 0.05 (NS)
Height (cm)	156.9 ± 5.02	155.22± 6.00	> 0.05 (NS)
Duration of Surgery (minutes)	47.8± 27.8	45.6± 26.67	> 0.05 (NS)
Duration of Anaesthesia(min)	60.2± 30.05	57.28± 27.41	> 0.05 (NS)

Post-operative episode of nausea was observed immediately after surgery in 8% of patients in both groups. Episode of nausea in next two hours was 4% in group O and 12% in group D. Between 2- 6 hours; it was 8% in group O and 20% in group D. No episode of nausea was observed in group O after 6 hours whereas it was 8% between 6 to 12 hours in group D. (Table-2). No episode of vomiting was observed in both the groups after 24 hours which was found statistically significant. Difference in the PONV score between two groups was statistically highly significant (p<0.05) (Table-3).

Table. 2. Distribution of patients experiencing postoperative nausea from 0- 24 hours

Nausea	Group - O		Group - D	
	No. of Pts.	%	No. of pts	%
Immediately	2	8%	2	8%
0-2 hrs	1	4%	3	12%
2-6 hrs	2	8%	5	20%
6-12 hrs	0	0	2	8%
12-24 hrs	0	0	0	0%
Total	5	20%	12	48%

Table.3. PONV score

PONV SCORE	Group-O No. (%)	Group -D No. (%)
No nausea & vomiting	18 (72 %)	8 (32%)
1(episode of nausea)	5 (20%)	12 (48%)
2(episode of retching & vomiting)	2 (8%)	5 (20%)
Total	25 (100%)	25 (100%)
P value <0.05(highly significant)		

Rescue antiemetic was given when PONV score was 2. Requirement of rescue antiemetic was minimum, i.e., 8% in group O. Incidence of side effects (headache, constipation and dizziness) was less in group O as compared to group D.

DISCUSSION

Limited studies have compared the effects of dexamethasone and ondansetron on PONV, and their findings are contradictory. A study report that effect of ondansetron is comparable with dexamethasone another study showed that ondansetron was better than dexamethasone and yet another study showed that dexamethasone was a little more effective than ondansetron in preventing PONV.^{5,6,7}

The difference in the findings of the above studies might be related to wide range of differences in sample sizes, patients qualities, type of surgical operations and anesthetic techniques, the way that PONV was defined and studied, and most important of all the dosage of the antiemetic drugs and the timing of their administration.

The present study showed that ondansetron was more effective than dexamethasone in preventing PONV. The results were comparable with a study wherein the demographic profile, types of laparoscopic surgeries, duration of anaesthesia and surgeries were similar with this study.⁸The

component like incidences of early and late nausea and vomiting and rescue drugs were also comparable with similar studies^{8,9} Incidence of side effects was comparable with the study of Henzi I⁹ and Prabhat Kumar.¹⁰

CONCLUSION

Prophylactic therapy with ondansetron is more effective than Dexamethasone for prevention of PONV with least side effect. We advocate, ondansetron may be added routinely as a pre-medication of general anesthesia for laparoscopic surgeries.

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