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Original Article

Comparative Study of Metoclopromide with Ondansetron and Dexamethasone in Prevention of Post-Operative Nausea and vomiting in Abdominal Surgeries

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***ABSTRACT*:**

PONVcommon complications of all type of abdominal surgeries.Increased morbidity due to Electrolyte imbalance, severe dehydration, Suture line tension surgical wound dehiscence and life threatening airway compromise. Multifocal in origin no single stimulus. The occurrence of PONV was lower in combination (ondansetron + dexamethasone) group than metoclopramide alone.

Key words: Abdominal Surgeries, metoclopramide, Ondansetron, Dexamethasone.

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INTRODUCTION

Postoperative nausea and vomiting are common complications of all type of abdominal surgeries. It results in significant morbidity and longer stays in the hospital, especially in patients underwent laparoscopic cholecystectomy.[1] It can be reason for significant morbidity including electrolyte imbalance, severe dehydration, suture line tension and surgical wound dehiscence and life threatening airway compromise.[2]

PONV have been associated for many years with the use of general anaesthetics for operative procedures. John Snow reported this phenomenon. He suspected that movement immediately after surgery may have triggered vomiting.[3] Plenty of antiemetic drugs available, no single agent is 100% effective. This may be due to PONV is multifocal in origin and there is no single stimulus.[4]In current years interest has been focused on combination remedy. Hence the present study was carried to find the role and safety of metoclopromide, and ondansetron plus dexamethasone in preventing PONV in patients undergoing abdominal surgery.

Duration of study: Six month

Objective

1) To compare the efficacy of METACLOPROMIDE with combination of ondansetron and dexamethasone in preventing postoperative nausea and vomiting after abdominal surgery.

2) To compare side effects of METACLOPROMIDE with the combination of ondansetron & dexamethasone when used for prevention.

Dexamethasone

It is a synthetic Adrenocorticosteroid with glucocorticoid activity. It is one of the most active glucocorticoids, very potent and highly elective. Dexamethasone has anti-inflammatory and immunosuppressant activity. It antagonize prostaglandin or release endorphins that elevate mood, improve one's sense of well-being, and stimulate appetite. It reduce postoperative fatigue, pain, total opioid requirements, and levels of C-reactive protein, in addition if given 90 minutes before laparoscopic cholecystectomy significantly reducing the frequency of PONV and improve surgical outcome.[5] Prolonged administration may result in hypothalamic-pituitary-adrenal (HPA) suppression.

Metoclopramide

It is dopamine-receptor antagonists.[6] used for stomach and oesophageal problems.[7] Commonly used to treat and prevent nausea and vomiting, & help with emptying of the stomach in people with delayed stomach emptying, gastroenteritis and to help with gastroesophageal reflux disease. Metoclopramide increases peristalsis of the duodenum and jejunum , increases tone and amplitude of gastric contractions, and relaxes the pyloric sphincter and duodenal bulb, while simultaneously increasing lower esophageal sphincter tone. In pregnancy no evidence of harm has been found after being taken by many pregnant women.[8] The antiemetic action of metoclopramide is due to its antagonist activity at D_2 receptors in the chemoreceptor trigger zone atcentral nervous system. This action prevents nausea and vomiting triggered by most stimuli.[9] At higher doses, 5-HT_3 antagonist activity may also contribute to the antiemetic effect.[10]The gastroprokinetic activity of metoclopramide is mediated by muscarinic activity, D_2 receptor antagonist activity, and 5-HT_4 receptor agonist activity.][11] The gastroprokinetic effect itself may also contribute to the antiemetic effect. Metoclopramide also increases the tone of the lower esophageal sphincter.[12]

Ondansetron

Is a potent, highly selective serotonin 5HT3 receptor-antagonist. Effective in the management of the nausea & vomiting induced by cytotoxic chemotherapy and radiotherapy by blocking 5HT receptors in the brainstem as well as in gut wall, which trigger vomiting reflex. Highly effective in reducing the incidence of post-anaesthetic nausea and vomiting. The mechanisms of action for postoperative nausea and vomiting are not known but there may be common pathways with cytotoxic induced nausea and vomiting. Ondansetron is an antiemetic agents used for the vomiting phase of cyclic vomiting syndrome. Ondansetron is extensively metabolised in the liver & excreted by the kidney. Arrhythmias, chest pain with or without ST segment depression, bradycardia reported especially after i.v. injection.

METHODOLOGY

A prospective a randomized controlled double blind study was done. Total of 60 patients were enrolled for the study & divided into two groups of 30 patients in each group:

Group M: Inj. Metaclopromide(4mg) i.v

Group O: Inj. ondansetron(4mg)i.v and inj. dexamethasone(4mg) i.v

INCLUSION CRITERIA:

1. Patients of ASA Grade I and II undergoing laparoscopic surgery.
2. Patients between age 18 & 55 years.
3. Patients weighing between 30 & 75 kg.

EXCLUSION CRITERIA:

1. Patients belonging to ASA Grade III and IV.
2. Patients who had received opioids, steroids, and antiemetic agents 24 hours Preoperatively.
3. Patients with a history of PONV.
4. Patient refusal

Randomization was done in the operation theatre prior to starting the case with a sealed envelope. Appropriate patients were selected after preoperative assessment. &investigation. Informed consent of the patient was taken. A day prior to surgery, preoperative evaluation done. All patients received Tab alprazolam 0.5mg and Tab ranitidine 150 mg on prior night of the surgery. Patients was kept nil by mouth from midnight. On the day of surgery, after checking preoperative orders, nil by mouth status, informed consent, equipment and anaesthesia machine the patient shifted to the operation theatre and the following monitors was attached for continuous monitoring pulse oximeter, non-invasive blood pressure, electrocardiography, capnography. An intravenous access was secured with a 20G cannula and Ringer Lactate infusion was started. Patients preoxygenated for 3 min & premedicated with Inj. Glycopyrrolate 2mcg/kg,Inj. Fentanyl 2mcg/kg,Inj. Midazolam 0.03mg/kg and then propofol was given for induction of anaesthesia in a dose of 2mg/kg. to the loss of eyelash reflex, neuromuscular blockade was achieved with inj. Atracuronium 0.5 mg/kg. After 3 mins of assisted ventilation, the patient was given the 'morning sniffing' position endotracheal intubation was done with an appropriate-sized endotracheal tube. General anaesthesia was maintained with nitrous oxide in oxygen and Sevoflurane with controlled ventilation through closed circuit. The patients was given study medication based on groups they belonged 30 min before extubation. At end of surgery, Patients were reversed with inj. neostigmine 0.05 mg/kg & Glycopyrolate 0.008 mg/kg, suction was done. Patients shifted to the recovery room after extubation & after confirming level of consciousness, intact reflexes &response to verbal command. The incidence of PONV was recorded within the first 24 h of surgery at intervals of 0-24 h for early and delayed recovery. Episodes of PONV was identified by spontaneous complaints by the patients or by direct questioning. All patients were observed for side effects such as drowsiness, muscle pain, constipation, diarrhoea or extrapyramidal reaction and treated accordingly up to 24 hrs.

Complications

All patients observed for intra-operative complication like, Hypotension, Bradycardia and Arrhythmias. The duration of surgery was recorded. Post-operatively assessed hourly for 4 hours and then 3 hourly up to 24 hours in recovery room. Postoperative complications was observed.

Statistical Analysis

All the collected data was entered in Microsoft Excel sheet and then transferred to SPSS software ver. 17 for analysis. Qualitative data was presented as frequency and

percentages and analysed using chi-square test of fisher's exact test (in case of 2x2 contingency tables). Quantitative data was presented as mean and SD and compared by t-test. P-value < 0.05 was taken as level of significance.

Observations

1. Sex distribution amongst different study population
2. Mean duration of surgery amongst different study population.
3. Mean age amongst different study population
4. Nausea & vomiting at 4 hrs & 24 hrs amongst different study population
5. Side effect observed amongst different study population.

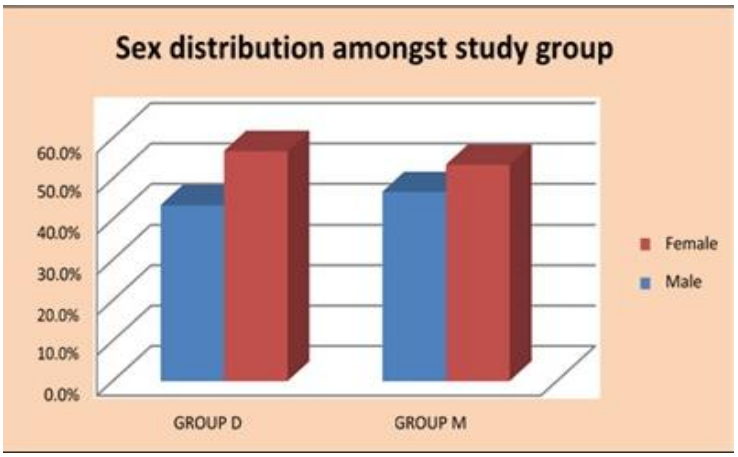
OBSERVATION AND RESULTS

Table 1: Sex distribution amongst different study population

			Groups	
			GROUP D	GROUP M
Sex	Male	Count	13	14
		% within Groups	43.3%	46.7%
	Female	Count	17	16
		% within Groups	56.7%	53.3%
		Count	30	30

P value- 0.795

As seen in table 1, the gender ratio (Male: Female) in patients of Group D was 13:17 and in patients of Group M was 14:16 and were comparable as p value was 0.795. Statistically, there was no significant difference between the groups (p=0.795).



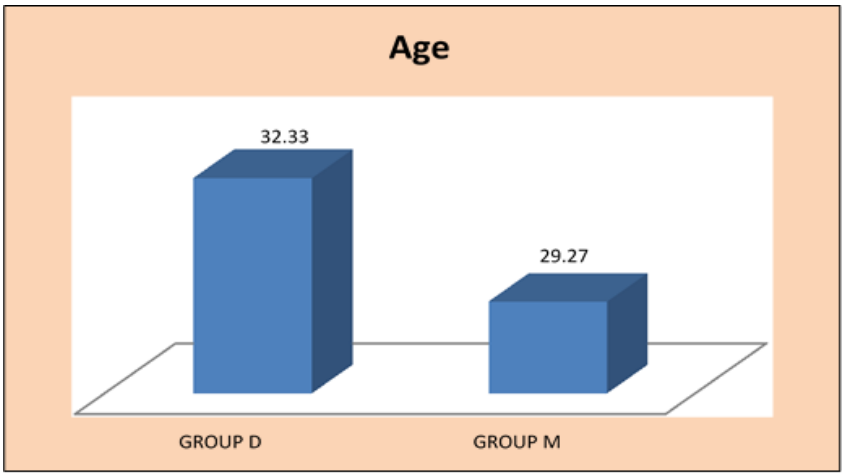
Graph 1: Sex distribution amongst different study population

Table no 2 Mean age amongst different study population

	GROUP D		GROUP M		
	Mean	Std. Deviation	Mean	Std. Deviation	P value
Age	32.33	8.189	29.27	7.027	0.125

(p= 0.125)

In Table 2 the mean age of patients in Groups D and M was 32.33 ± 8.189 years and 29.27 ±7.027 years respectively. Statistically, there was no significant difference between the groups



Graph 2: Mean age amongst different study population

Table no 3 Mean Duration of surgery amongst different study population

	GROUP D		GROUP M		
	Mean	Std. Deviation	Mean	Std. Deviation	P value
Duration of surgery	**64.33**	**17.157**	**61.33**	**13.578**	**0.456**

(p= 0.456)
The mean Duration of surgery in Groups D and M was 64.33 ± 17.157 minutes and 61.33 ± 13.578 minutes respectively. Statistically, there was no significant difference between the groups

Graph 3: Mean Duration of surgery amongst different study population

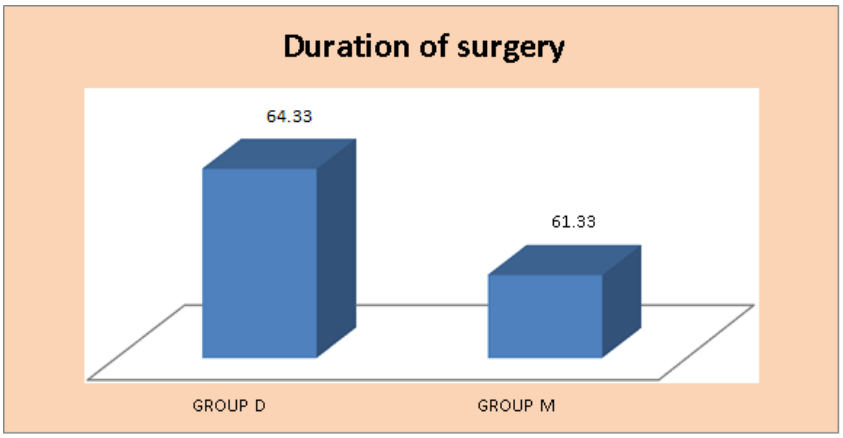
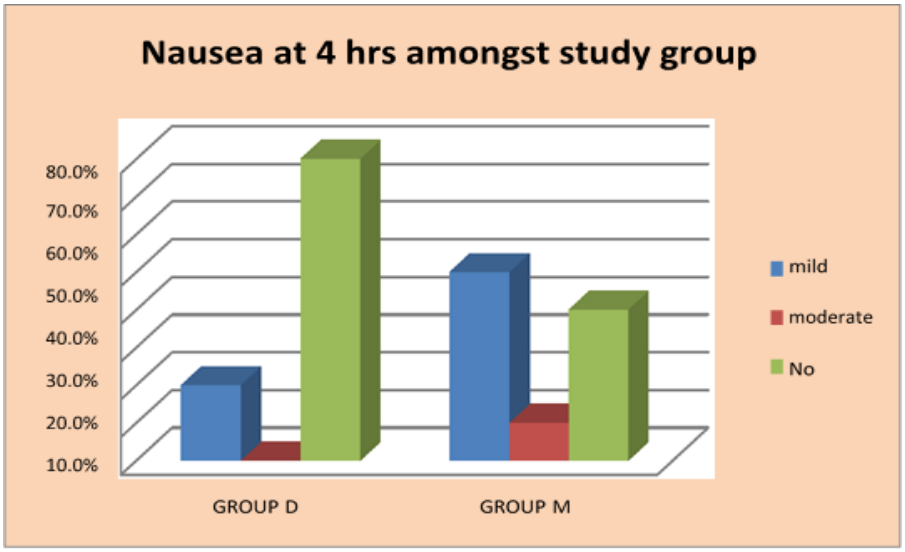


Table no 4 Nausea at 4 hrs amongst different study population

			Groups	
			GROUP D	GROUP M
Nausea at 4 hrs	Mild	Count	6	**15**
		% within Groups	20.0%	**50.0%**
	Moderate	Count	0	**3**
		% within Groups	0.0%	**10.0%**
	No	Count	24	**12**
		% within Groups	80.0%	**40.0%**
Total		**Count**	**30**	**30**

P value- 0.004
As seen in table 4, mild , moderate and no nausea at 4 hours was observed in 20% (6 cases) , 0% (0 cases) and 80% (24 cases) of group D patients while it was present in 50% (15 cases) , 10% (3 cases) and 40% (12 cases) of group M patients. There was statistically significant difference between nausea at 4 hours and different study population.



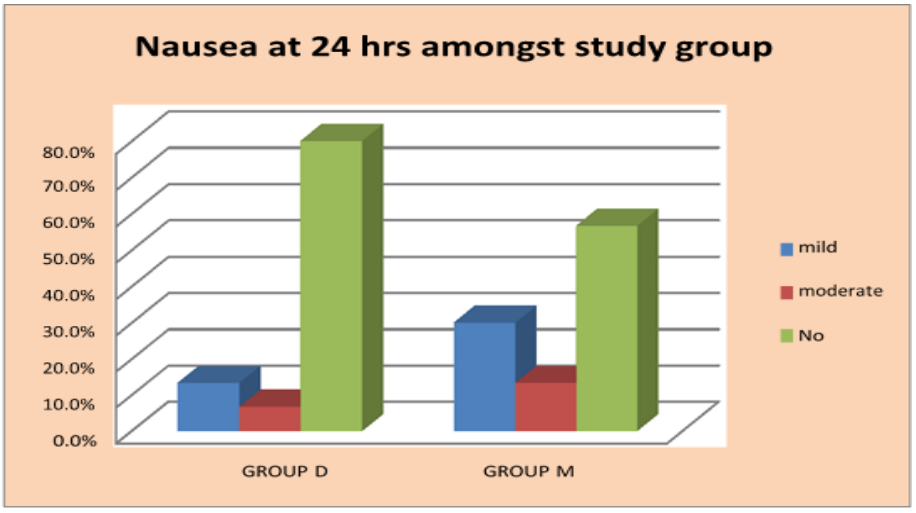
Graph 4: Nausea at 4 hrs amongst different study population

			Groups	
			GROUP D	**GROUP M**
Nausea at 24 hrs	Mild	Count	4	**9**
		% within Groups	13.3%	**30.0%**
	Moderate	Count	2	**4**
		% within Groups	6.7%	**13.3%**
	No	Count	24	**17**
		% within Groups	80.0%	**56.7%**
Total		**Count**	**30**	**30**

Table no 5 Nausea at 24 hrs amongst different study population

P value- 0.151

As seen in table 5, mild, moderate and no nausea at 24 hours was observed in 13.3% (4 cases) , 6.7 % (2 cases) and 80% (24 cases) of group D patients while it was present in 30% (9 cases) , 13.3 % (4 cases) and 56.7% (17 cases) of group M patients. There was statistically no significant difference between nausea at 24 hours and different study population.



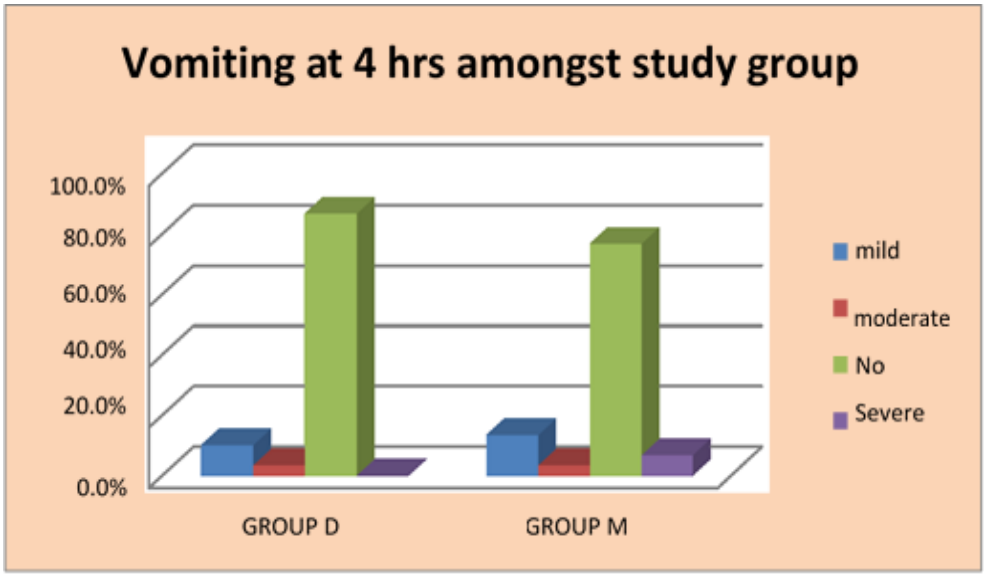
Graph 5: Nausea at 24 hrs amongst different study population

Table no 6 Vomiting at 4 hrs amongst different study population

			Groups	
			GROUP D	GROUP M
Vomiting at 4 hrs	Mild	Count	3	**4**
		% within Groups	10.0%	**13.3%**
	Moderate	Count	1	**1**
		% within Groups	3.3%	**3.3%**
	No	Count	26	**23**
		% within Groups	86.7%	**76.7%**
	Severe	Count	0	**2**
		% within Groups	0.0%	**6.7%**
Total		**Count**	**30**	**30**

P value- 0.507

As seen in table 6, mild, moderate severe and no vomiting at 4 hours was observed in 10% (3 cases), 3.3% (1 case) 0 % (0 cases) and 86.7% (26 cases) of group D patients while it was present in 13.3% (4 cases), 3.3% (1 case) , 6.7 % (2 cases) and 76.7% (23 cases) of group M patients. There was statistically no significant difference between vomiting at 4 hours and different study population



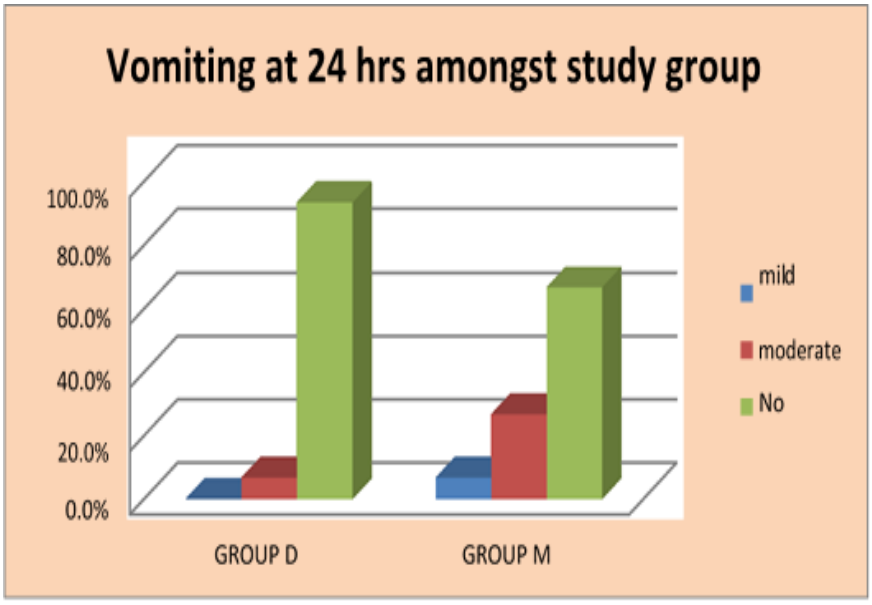
Graph 6: Vomiting at 4 hrs amongst different study population

Table no 7 Vomiting at 24 hrs amongst different study population

			Groups	
			GROUP D	GROUP M
Vomiting 24 hrs	Mild	Count	0	**2**
		% within Groups	0.0%	**6.7%**
	Moderate	Count	2	**8**
		% within Groups	6.7%	**26.7%**
	No	Count	28	**20**
		% within Groups	93.3%	**66.7%**
Total		**Count**	**30**	**30**

P value- 0.031

As seen table 7, mild, moderate and no vomiting at 24 hours was observed in 0% (0 cases), 6.7 % (2 cases) and 93.3% (28 cases) of group D patients while it was present in 6.7 % (2 cases) , 26.7 % (8 cases) and 66.7% (20 cases) of group M patients. There was statistically significant difference between vomiting at 24 hours and different study population.



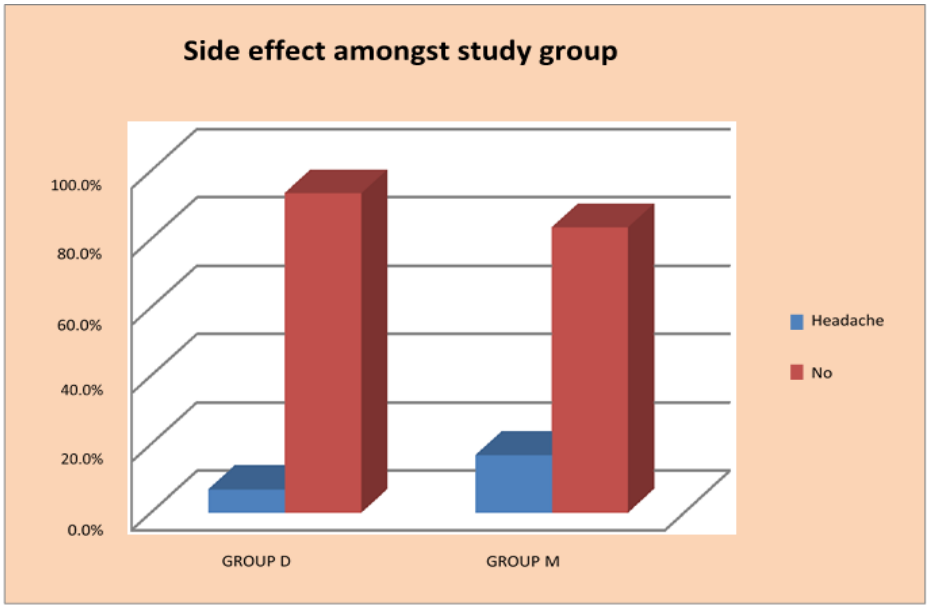
Graph 7: Vomiting at 24 hrs amongst different study population

Table no 8 Side effect observed amongst different study population

			Groups	
			GROUP D	GROUP M
Side effect	Headache	Count	2	**5**
		% within Groups	6.7%	**16.7%**
	No	Count	28	**25**
		% within Groups	93.3%	**83.3%**
Total		**Count**	**30**	**30**

P value- 0.228

As seen in table 8, side effect like headache was observed in 6.7% (2 cases) of group D patients while it was observed in 16.7% (5 cases) of group M patients. There was statistically no significant difference between side effect like headache and different study population.



Graph 8 : Side effect observed amongst different study population

DISCUSSION

Abdominal surgeries are common in postoperative nausea and vomiting with the use of general anaesthetic. Extensive descriptions of the phenomenon were elaborated by John Snow.

Souvik Maitra et al., the incidence of postoperative nausea is significantly lower at 4–6 h when dexamethasone was used instead of ondansetron.[13] The etiology of PONV is multifactorial like pharyngeal, stimulation, gastrointestinal distension, abdominal surgery, anaesthetic agent, pain, opioids, hypoxia, hypotension, vestibular disturbances and psychological factors.

CONCLUSION

The occurrence of PONV was lower in combination (ondansetron +dexamethasone) group than ondansetron alone. Hence, the efficacy of combination therapy was found to be superior to ondansetron alone.

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