

# Post operative Nausea Vomiting (PONV): A Clinical Study of Role of Ondansetron and Metoclopramide

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## ABSTRACT

**Introduction:** One of the sequence of anaesthesia is the post operative nausea and vomiting. nausea and vomiting post operative period is not only unpleasant and distressing, but a major factor in upsetting post operative convalescence. Hence the study was done to ascertain the role of ondansetron and metoclopramide in post operative nausea and vomiting, and their comparative efficacy in smoothening convalescence.

**Material and Methods:** Prospective double blind randomized study was planned after institutional ethical committee clearance, 160 patients belonging to ASA class 1 and 2, and scheduled for general surgeries under general anaesthesia, were randomized into 4 (four) groups equally of 40 each, divided as placebo group, ondansetron 4mg, ondansetron 8mg and metoclopramide 10mg groups. The study drugs were given just prior to extubation and all parameters were noted. Statistical analysis was done by  $\chi^2$  test i.e. fourfold or 2x2 contingency table.

**Results:** Ondansetron group showed less amount of PONV compared to metoclopramide group. there were no significant difference between ondansetron 4mg and 8 mg. female gender showed more incident of PONV.

**Keywords:** Nausea Vomiting (PONV), Ondansetron, Metoclopramide

College and Hospital, Dibrugarh following approval by the institutional research committee.

**Sample size:** The study included 160 patients of both sex of similar age groups, undergoing general surgery under a standard anaesthetic regime.

## Inclusion and Exclusion Criteria

All patients belonged to either ASA I and II were included in the study. Uncooperative and those with co morbid conditions were excluded.

Patient Patients were visited on the pre operative day for pre anaesthetic check up. They were explained about the procedure and written informed consent was obtained from each patient. Using double blind technique, patients were grouped into 4 (four) groups containing 40 patients each.

Group I received placebo

Group II received metoclopramide 10 mg

Group III received ondansetron 4 mg

Group IV received ondansetron 8 mg.

The standard anaesthetic technique comprised of the following. Patients were pre medicated with tramadol 1 mg/kg body weight and glycopyrrolate (0.005 mg/Kg). The patient was then preoxygenated with 100% oxygen for 3mins before induction with a tight fitting face mask. Anaesthesia was induced with Propofol (2mg/kg) and administered slowly till the loss of eyelash reflex and then Succinylcholine was administered (1 – 1.5 mg/kg). Laryngoscopy and intubation was done thereafter. Anaesthesia was maintained with O<sub>2</sub> and N<sub>2</sub>O in 33:66 ratio. At the end neostigmine and glycopyrrolate was used as reversal. The study drugs were administered intravenously just prior to extubation. Patients were observed till they are discharged from the hospital.

The parameters that were observed are pulse, blood pressure, pain, analgesics, fluid input output, episodes of nausea, retching and vomiting, rescue antiemetics if needed and adverse effects if any. The severity of nausea, retching and vomiting is graded as mild if it ensued once or twice, moderate if there were three to five episodes and severe if it occurred more than five times.

## INTRODUCTION

Convalescence following anaesthesia and surgery engulfs a wide spectrum. The sequence of metabolic and endocrine events in this phase depends not only on the types of anaesthesia, but also on duration and nature of surgery, disease process itself and its influence on various systems. One of the sequence of anaesthesia is the post operative nausea and vomiting. nausea and vomiting post operative period is not only unpleasant and distressing, but a major factor in upsetting post operative convalescence. Kapur et al<sup>1</sup> in his editorial has very aptly described post operative nausea vomiting as the big “little problem”.

Moreover the safety of the patient may be jeopardised by aspiration of vomitus, if patient is not in a position to expel it such as in cases of maxillofacial surgery where the jaws are wired. Persistent vomiting may also lead to major metabolic consequences like dehydration and electrolyte imbalance.

All these factors greatly delays the return to a normal physiological status and thereby delays post operative convalescence period. Moreover those patients will also hesitate to accept anaesthesia in future.

Thereby the purpose of this study was to ascertain the role of ondansetron and metoclopramide in post operative nausea and vomiting, and their comparative efficacy in smoothening convalescence.

## MATERIAL AND METHODS

The study was conducted from in 2014 in Assam Medical

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	Placebo	Metoclopramide 10mg	Ondansetron 4mg	Ondansetron 8mg
No. of patients	40	40	40	40
Male/female	23/17	17/23	18/22	19/21
Age (years)	32.35	33.52	34.61	31.17
Weight (kgs)	52.45	53.25	54.65	55.22

**Table-1:** Demographic data

Groups	total no. of patients	nausea			retching			Vomiting			Patient involed	
		mild	moderate	severe	mild	moderate	severe	mild	moderate	severe	no	%
Male												
placebo	23	5	4	1	6	1	1	5	2	1	10	43
Metoclopramide 10mg	17	5	0	1	3	2	0	2	3	0	6	35
Ondansetron 4mg	18	3	1	0	2	1	0	3	0	0	4	22
Ondansetron 8mg	19	4	1	0	2	1	0	3	1	0	5	26
Female												
placebo	17	6	3	4	4	1	2	5	3	4	13	76
Metoclopramide 10mg	23	7	4	1	6	0	1	5	3	3	12	52
Ondansetron 4mg	22	3	4	1	3	1	3	3	3	1	8	36
Ondansetron 8mg	21	4	2	1	3	2	1	3	1	1	7	33

**Table-2:** Showing the incidence of nausea,retching and vomiting in four groups

Groups	Total no. of patients	Free of all symptoms		With symptoms %
		No.	%	
Male				
Placebo	23	13	57	43
Metoclopramide 10mg	17	11	65	35
Ondansetron 4mg	18	14	78	22
Ondansetron 8mg	19	14	74	26
Female				
Placebo	17	4	24	76
Metoclopramide 10mg	23	11	48	52
Ondansetron 4mg	22	14	64	36
Ondansetron 8mg	21	14	67	33

**Table-3:** Patients free of all symptoms and sign by sex

**STATISTICAL ANALYSIS**

The data were recorded on predesigned and pretested proforma, and was tabulated and master chart was prepared. Demographic data, Heart Rate (HR), systolic BP, diastolic BP and Mean arterial pressure (MAP) were tabulated as Mean ± SD. Statistical analysis was done by  $\chi^2$  test i.e fourfold or 2x2 contingency table, using the computer program Graph Pad Instat. Microsoft Word and Excel have been used to generate graphs and tables. p value of less than 0.05 was considered significant.

**RESULTS**

The present study comprised of 160 patients of both sex undergoing general anaesthesia in Assam Medical College and Hospital.

The present work attempts to compare the efficacy of Ondansetron and metoclopramide in post operative convalescence.

The relative history, physical findings and individual results are recorded. The table-1 illustrates some of our demographic

observations made in our study.

Tables 2 and 3 shows that the severity was more in females compared to males. Also ondansetron group had less incidence of nausea vomiting compared to placebo and metoclopramide group.

**DISCUSSION**

Post operative nausea and vomiting continues to be a common troublesome sequel following anaesthesia. Despite of our knowledge of physiology of vomiting the exact aetiology is still obscure. Various factors are implicated to the causation of post operative nausea and vomiting. The anaesthetic factors implicated are the anaesthetic drugs, adjuvants, techniques and the efficiency of the anaesthetist.

Regarding the severity of nausea, Larijani et al<sup>2</sup>, (1991) observed nausea alone in 78 percentage of patients in the placebo group compared with 28 percent in the metoclopramide 10mg group. In our study, it was observed that there is significant difference in mild degree of nausea ( $p < 0.01$ ) between metoclopramide and placebo. But no significant difference is seen in moderate and severe degree of nausea. And significant difference in the overall incidence of nausea between placebo and metoclopramide ( $p < 0.05$ ) is observed.

It was observed in Table 3, that severity was significantly less ( $p < 0.01$ ) in the ondansetron group. But no significant difference was seen in mild and moderate degree of nausea. Our findings correlates with that of Claybon<sup>3</sup> [1994], who showed that ondansetron 4mg is superior to placebo for complete control of nausea.

In relation to retching, significant lower incidence of retching was seen in the metoclopramide 10 mg group ( $p < 0.05$ ) compared to placebo. It was seen that mild degree of retching was significantly less in ondansetron 4 mg group ( $p < 0.05$ ). It was also observed that the severity of retching was significantly

less in ondansetron 8 mg group ( $p < 0.01$ ).

Regarding vomiting in our study it was observed that 50 percent in the placebo group and 40 percent in the metoclopramide group had episodes of vomiting.

Significant low incidence of vomiting was seen in ondansetron 4 mg compared to placebo ( $p < 0.05$ ) which tallies with the findings of Claybon<sup>3</sup> [1994] and Diemunsch et al<sup>4</sup> [1997] who in his study observed that 4 mg ondansetron is effective for complete control of emetic episodes. While considering the severity, it was observed that the severe degree of vomiting was less in ondansetron 4 mg, but no significant difference was seen in mild and moderate degree.

While comparing ondansetron 8mg with placebo, the incidence of vomiting was significantly less in ondansetron group. While considering the severity, it was observed that mild and severe degree of vomiting was less in ondansetron group. But no significant difference was seen in moderate degree of vomiting. Regarding the incidence and severity of nausea, retching and vomiting in both gender groups, it was observed in our study, that the severe degree of nausea, retching and vomiting was significantly high in females to males. In the metoclopramide 10 mg group, moderate degree of nausea and severe degree of both retching and vomiting was observed to be significantly high in females. And in the ondansetron 8mg group, severe degree of nausea, retching and vomiting was significantly high in females. Thus it can be deduced that the severity was significantly more in female patients compared to males. Increase severity in females in comparison to males was also stated by Purkis<sup>5</sup> in 1964.

Regarding the incidence of postoperative nausea and vomiting, Pearman<sup>6</sup> (1994) observed the incidence to be 56% in the placebo group and 32 % in the ondansetron 8mg group. In our study we observed the incidence to be 58% and 30 % in placebo and ondansetron 8mg group. Our study also tallies with the findings of Kovac et al<sup>7</sup>, Palazzo and Strunin<sup>8</sup> (1984), Rowbotham<sup>9</sup> (1992) and Quinn et al<sup>10</sup> where incidence of nausea vomiting was less with metoclopramide group rather than control group.

## CONCLUSION

A clinical study of the efficacy of ondansetron and metoclopramide was carried out in 160 patients. The patients were grouped into four groups of equal numbers, each comprising 40 patients. Grouping was based on different drugs administered.

The overall incidence of post operative nausea and vomiting in the present study was 57.5 percent. While comparing the different groups, the overall incidence of postoperative nausea and vomiting was observed to be 57.5 percent in placebo group, 45 percent in metoclopramide 10mg group, 30 percent in ondansetron 4mg and 8 mg group.

While comparing the severity of nausea, it was significantly less in the ondansetron 4mg group compared to metoclopramide 10 mg group. While comparing ondansetron 4 mg and 8 mg, patients in ondansetron 8mg group had significantly less moderate degree of nausea, but no difference between the two groups was seen regarding the severe degree of nausea.

Regarding retching, the incidence observed in our study was 37.5% in placebo group, 30% in metoclopramide group, 25% in ondansetron 4mg and 22.5% in ondansetron 8mg group.

Regarding vomiting, the incidence observed in our study was 50% in placebo, 40% in metoclopramide 10 mg, 25% in ondansetron 4mg, and 22.5% in ondansetron 8mg group. While comparing the severity, mild degree of vomiting was significantly less in ondansetron 4mg group compared to metoclopramide group. Mild and moderate degree of vomiting was significantly less in ondansetron 8mg group compared to metoclopramide. While comparing ondansetron 4mg and 8mg, no significant difference was seen in any degree of vomiting.

Regarding the incidence of post operative nausea and vomiting in relation to gender groups, it was observed that the overall incidence to be 48.19% in females and 32.46% in males. Thus females were more prone to post operative nausea vomiting compared to males.

Hence we can conclude that both metoclopramide and ondansetron were effective in decreasing the incidence of post operative nausea and vomiting. Ondansetron was more effective compared to metoclopramide. No significant difference could be seen between ondansetron 4mg and 8mg. Thus ondansetron have role in prevention of post operative emesis and help convalescence.

## REFERENCES

1. Kapur, PA: The big "little problem". *Anesth. Analg.* 1991; 73:243-245.
2. Larijari GE, Gratz I, Afshar M, Minassian S. Treatment of post operative nausea and vomiting with ondansetron: A randomized, double blind comparison with placebo. *Anesth. Analg.* 1991;73:246-249.
3. Claybon L. Single dose intravenous ondansetron for the 24 hours treatment of postoperative nausea and vomiting. *Anaesthesia.* 1994;49 (suppl):24-29.
4. Diemunsch P, Counseiller C, Clyti N, Mamet JP and French ondansetron study group. Ondansetron compared with metoclopramide in the treatment of established postoperative nausea and vomiting. *Br.J.Anaesth.* 1997;79:322-326.
5. Purkis IE. Factors that influence postoperative vomiting. *Can. Anaesth. Soc. J.* 1964;11:335-353.
6. Pearman MH. Single dose intravenous ondansetron in the prevention of post operative nausea and vomiting, *Anaesthesia.* 1994;49 (Suppl.):11-15.
7. Kovac A, McKenzie R, O'Connor T, Duncalf D, Angel J, et al. Prophylactic intravenous ondansetron in female outpatients undergoing gynaecological surgery: a multicentre dose comparison study. *Eur.J.Anaesth.* 1992;9 (suppl) 6:37-47.
8. Palazzo MGA, Strunin L. Anaesthesia and emesis 1. Etiology. *Can. Anaesth.Soc.J.* 1984;31:407-15.
9. Rowbotham, DJ. Current management of postoperative nausea and vomiting. *Br.J. Anaesth.* 1992;69 [Suppl.]:46S-59S.
10. Quinn AC, Brown JH, Wallace AG, Asbury AJ. studies in post operative sequel. Nausea and vomiting, Still a problem, *Anaesthesia.* 1994;49:62-65.

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