vasovagal reaction, air embolism, dural puncture, anterior spinal artery syndrome, disc injury, trauma to spinal nerve or dorsal root ganglion and hypersensitivity reaction to the drug [14]. In our study, one patient in Group IL had vasovagal reaction 10 minutes following the procedure which was managed successfully. Though we used particulate steroid we did not come across any complication.

There are some limitations of the study undertaken. Long term outcome was not studied due to the shorter duration chosen for the study. Multiple level IVDH cases were not included in the study. Hence the results of this study may not be applicable to the patients with multiple level disc disease.

Further studies can be carried out to evaluate the long-term outcome of ILESI and TFESI, and efficacy of these approaches when IVDHs present at multiple levels. Studies using non-particulate steroids can be carried out to make epidural steroid injection safer and to evaluate the efficacy of non-particulate steroids as compared to particulate steroids.

Conclusion

Epidural steroid injection by trans-foraminal approach provides better subjective pain relief than interlaminar approach in short term. However, no significant difference is seen between two approaches with regard to improvement in SLRT, walking tolerance, reduction in analgesic use and reversal of paraesthesia in short term.

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Original Article

Indian Journal of Anaesthesia and Analgesia
Volume 4 Number 2, April - June 2017 (Part–2)
DOI: http: / / dx.doi.org / 10.21088 / ijaa.2349.8471.4217.11

The Comparative Study of the Efficacy of Palanosetron, Ondansetron and Metoclopramide in the Control of Post-Operative Nausea and Vomitting (PONV)

Deepa T.

Abstract

Background and Aims: Post-Operative Nausea and Vomitting (PONV) Continues to be a highly undesirable outcome of anaesthesia and SX. We compared the efficacy of Palanosetron, Ondansetron and Metoclopramide in the control of PONV. *Methods:* A total of 60 Patients were randomly allocated to three groups, Group (P): received intravenous Palanosetron 0.25mg, Group (O): received intravenous Ondansetron 4mg, Group (M): received intravenous Metoclopramide 10mg. Incidents of Early (0- 2 Hours) and Late Post-Operative (2- 24 hours) Nausea and Vomiting were assessed. Statistical analysis were performed using Chi- square and Fisher 'f' probability test. *Results:* Incidence of Early Post operative nausea (0-2 hours) in Group (P) was 0% (0 / 20) Compared to Group (O) and Group (M) which were 5% (1 / 20) and 0% (0 / 20) respectively. Incidence of late post-operative (2 -24 hours) Nausea in Group (P) was 5% (1 / 20), Group (O) was 20% (4 / 20) and Group (M) 10% (2 / 20) respectively. There is no significant difference in the anti nausea efficacy of Palanosetron compared to ondansetron and metoclopramide. The incidence of early post-operative (0-2 hours) vomiting in Group (P) was 0% (0 / 20), Group (O) 10% (2 / 20) and Group (M) 5% (1 / 20). Incidence of Post operative (2-24 hours) vomiting in group (P) 5%(1 / 20), Group (O) 15% (3 / 20), Group (M) 15% (3 / 20). Comparing overall incidence of vomiting showed that the antiemetic efficacy of Palanosetron is the same as Ondansetron and Metoclopramide for Post-Operative emisis. *Conclusion:* Prophylactic administration of Palonosetron, Ondansetron and Metoclopramide for PONV, there was no significant difference in the anti-nausea and anti-emetic efficacy of Palonosetron compared to Ondrasetron and Metoclopramide. The magnitude of effect against PONV appears to be similar to that of other established drugs.

Keywords: Anti-Nausea; Anti-Emetic; PONV; $5HT_3$ Antagonists; Palanosetron; Metaclopramide

Introduction

PONV is a limiting factor in the early discharge of ambulatory surgery patients and is a leading cause of unanticipated hospital admission[1]. PONV can lead to an increased recovery room time, expanded nursing care and increase total health care costs. Equally important are the high levels of patient discomfort and dissatisfaction associated with PONV. Patients report avoidance of PONV is of greater concern than avoidance of postoperative pain. Over the years, numerous drugs have been used in the management of PONV ex: Phenothiazines – Chlorpromazine, promethazine, prochlorperazine, perphenazine. In an editorial , PONV is described as 'the big little problem' following ambulatory surgery [2].

Metaclopramide is a selective D_2 antagonist. It is a derivative of Paraminobenzoic acid and structurally related to procainamide. It is one of the oldest prokinetic agents. It hastens gastric emptying and increases tone of LES [3].

Ondansetron is a selective 5-HT_3 receptor antagonist [4]. Palonosetron is highly specific and selective serotonin receptor antagonist with strong binding affinity [5,6].

Ondansetron and Palonosetron decreases chemotherapy induced

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Received on 30.01.2017
Accepted on 07.02.2017

emesis when added to an antiemetic regimen and also act as a potentially useful prophylaxis for PONV. It is also used for the prevention of PONV.

Methods

After obtaining approval from institutional ethical committee and written informed consent, 60 patients [ASA grade I, II & III aged b/w 18-65Yrs] undergoing short surgical procedure were included in a prospective, randomized, double-blind, controlled clinical trial which was completed over a period of one year.

Patients were excluded from the study if they had a history of acid peptic disease or hepatic dysfunction, with previous history of PONV or any antiemetic medications, history allergy, history of chronic cough, and history of motion sickness.

All the patients were explained and were randomly allocated in to three groups to receive:-

Group P (n = 20) Inj: Palonosetron 0.25mg

Group O (n = 20) Inj: Ondansetron 4 mg.

Group M (n = 29) Inj: Metoclopramide 10 mg.

After nil per orally for 8-10hrs, all patients underwent a standardized anaesthesia protocol. All the study agents were introduced intravenously prior to starting of procedure. Vitals monitored throughout, after the procedure patients is shifted to postoperative ward when fully awake and monitoring continued. Emetic episodes (nausea and/or vomiting) experienced by patients were recorded immediate postoperatively (0-2 hours) and postoperatively (2-2hours) in the post-operative ward by anaesthesiologist who was blinded to the treatment patient had received. If one or more episodes of emesis occurred in each observation period inj. Ondansetron 4mg i.v. was administered as rescue antiemetic to the patient.

Statistics

A total of 60 patients of ASA grade I, II and III were categorized into 3 groups.

Group P: Received i.vPalonosetron 0.25mg

Group O: Received i.vOndansetron 4mg

Group M: Received i.v Metoclopramide 10mg

Results of fisher 'f ' test of comparison of age, sex, ASA grading is shown in following tables. p value of less than 0.05 was considered as significant.

Table 1: Age incidence in different groups

	N	Mean	Std. Deviation	Minimum	Maximum
Inj. Palanosetron 0.25mg i.v.	20	45.5500	13.88098	22.00	63.00
Inj.Ondansetron 4mg i.v	20	38.2000	13.98721	20.00	35.00
Inj. Metoclopramide 10mg i.v	20	43.3000	13.89472	23.00	60.00

a. x2=10.05 p=.007 hs

Age difference in the three groups showed no statistical significance

Table 2: Sex distribution in different groups

			SEX * GROUP Group			Total
			Inj. Palanosetron 0.25mg i.v.	Inj.Ondansetron 4mg i.v.	Inj. Metoclopramide 10mg i.v.	
SEX	F	Count%	15 75.0%	8 40.0%	17 85.0%	40 66.7%
	M	Count%	5 25.0%	12 60.0%	3 15.0%	20 33.3%
Total		Count%	20 100.0%	20 100.0%	20 100.0%	60 100.0%

a. x2=10.05 p=.007 hs

The above table show that the incidence of nausea and vomiting was significant in female patients as compared to male patients- satistically significant.

Table 3: ASA grading in different groups

		ASAGRADE Group			Total
		Inj. Palanosetron 0.25mg i.v.	Inj. Ondansetron 4mg i.v.	Inj. Metoclopramide 10mg i.v.	
I	Count	6	14	9	29
	%	30.0%	70.0%	45.0%	48.3%
II	Count	6	5	0	11
	%	30.0%	25.0%	.0%	18.3%
III	Count	8	1	11	20
	%	40.0%	5.0%	55.0%	33.3%
Total	Count	20	20	20	60
	%	100.0%	100.0%	100.0%	100.0%

a. X2=16.916 p=.002 hs

ASA grading in the three groups- in the above table show that incidence was significant in ASA grade I and was statistically significant

Incidence of Nausea or vomiting:

Statistical analysis was performed by using chi – square and fisher 'f' probability test.

Nausea

Incidence of Early Post operative nausea (0-2 hours) in Group (P) was 0% (0/20) Compared to Group (O) and Group (M) which were 5% (1/20) and 0% (0/20) respectively. Incidence of late post-operative (2 -24 hours) Nausea in Group (P) was 5% (1/20), Group (O) was 20% (4/20) and Group (M) 10% (2/20) respectively. There is no significant difference in the anti nausea efficacy of Palanosetron compared to ondansetron and metoclopramide.

Early Postoperative 0-2 hrs – Nausea

		Group			Total
		Inj. Palanosetron 0.25mg i.v.	Inj. Ondansetron 4mg i.v.	Inj. Metoclopramide 10mg i.v.	
Absent	Count	20	19	20	59
	%	100.0%	95.0%	100.0%	98.3%
Present	Count	0	1	0	1
	%	.0%	5.0%	.0%	1.7%
Total	Count	20	20	20	60
	%	100.0%	100.0%	100.0%	100.0%

a. x2=2.034 p=.362 ns

Post Operative2-24 hrs Nausea

		Group			Total
		Inj. Palanosetron 0.25mg i.v.	Inj. Ondansetron 4mg i.v.	Inj. Metoclopramide 10mg i.v.	
.00	Count	19	16	18	53
	%	95.0%	80.0%	90.0%	88.3%
1.00	Count	1	4	2	7
	%	5.0%	20.0%	10.0%	11.7%
Total	Count	20	20	20	60
	%	100.0%	100.0%	100.0%	100.0%

Vomiting

The incidence of early post-operative (0-2 hours) vomiting in Group (P) was 0% (0/20), Group (O) 10% (2/20) and Group (M) 5% (1/20). Incidence of Post operative (2-24 hours) vomiting in group (P) 5% (1/20), Group (O) 15% (3/20), Group (M) 15% (3/20). Comparing overall incidence of vomiting showed that the antiemetic efficacy of Palanosetron is the same as Ondansetron and Metoclopramide for Post-Operative emisis.

Early Postoperative 0-2 hrs — Vomiting

		Group			Total
		Inj. Palanosetron 0.25mg i.v.	Inj. Ondansetron 4mg i.v.	Inj. Metoclopramide 10mg i.v.	
.00	Count	20	18	19	57
	%	100.0%	90.0%	95.0%	95.0%
1.00	Count	0	2	1	3
	%	.0%	10.0%	5.0%	5.0%
Total	Count	20	20	20	60
	%	100.0%	100.0%	100.0%	100.0%

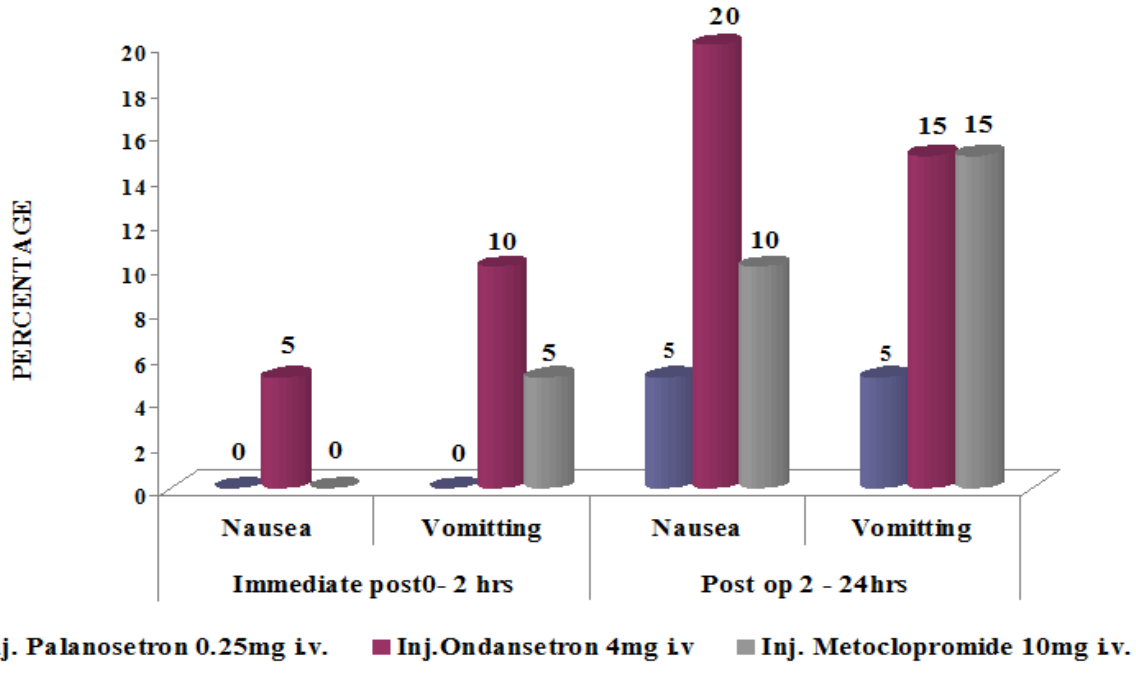
a. x2=2.105 p=.349 ns

Postoperative 2-24 hrs Vomiting

		Group			Total
		Inj. Palanosetron 0.25mg i.v.	Inj. Ondansetron 4mg i.v.	Inj. Metoclopramide 10mg i.v.	
.00	Count	19	17	17	53
	%	95.0%	85.0%	85.0%	88.3%
1.00	Count	1	3	3	7
	%	5.0%	15.0%	15.0%	11.7%
Total	**Count**	20	20	20	60
	%	100.0%	100.0%	100.0%	100.0%

a. x2=1.294 p=.524 ns

Incidence of Early and Late Post Operative Nausea and Vomiting



Side Effects

Incidence of side effects- headache, dizziness and constipation in the three groups showed no statistical significance.

Table 4: side effect- Headache

		Side effects – Headache Group			Total
		Inj. Palanosetron 0.25mg i.v.	Inj. Ondansetron 4mg i.v.	Inj. Metoclopramide 10mg i.v.	
.00	Count	18	17	18	53
	%	90.0%	85.0%	90.0%	88.3%
1.00	Count	2	3	2	7
	%	10.0%	15.0%	10.0%	11.7%
Total	Count	20	20	20	60
	%	100.0%	100.0%	100.0%	100.0%

a. x2=.323 p=.851 ns

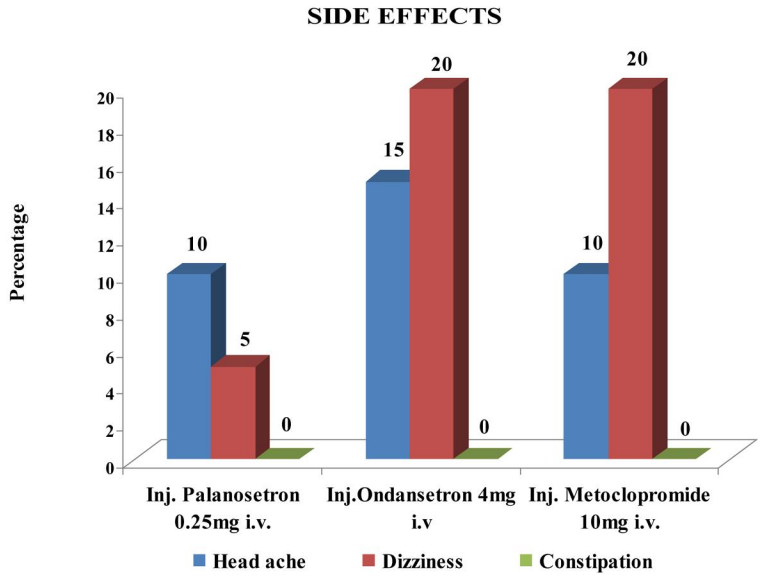
Table 5: Side effects-dizziness

		Side effects-dizziness Group			Total
		Inj. Palanosetron 0.25mg i.v.	Inj. Ondansetron 4mg i.v.	Inj. Metoclopramide 10mg i.v.	
.00	Count	19	60	16	51
	%	95.0%	80.0%	80.0%	85.0%
1.00	Count	1	4	4	9
	%	5.0%	20.0%	20.0%	15.0%
Total	Count	20	20	20	60
	%	100.0%	100.0%	100.0%	100.0%

a. x2=2.353 p=.308 ns

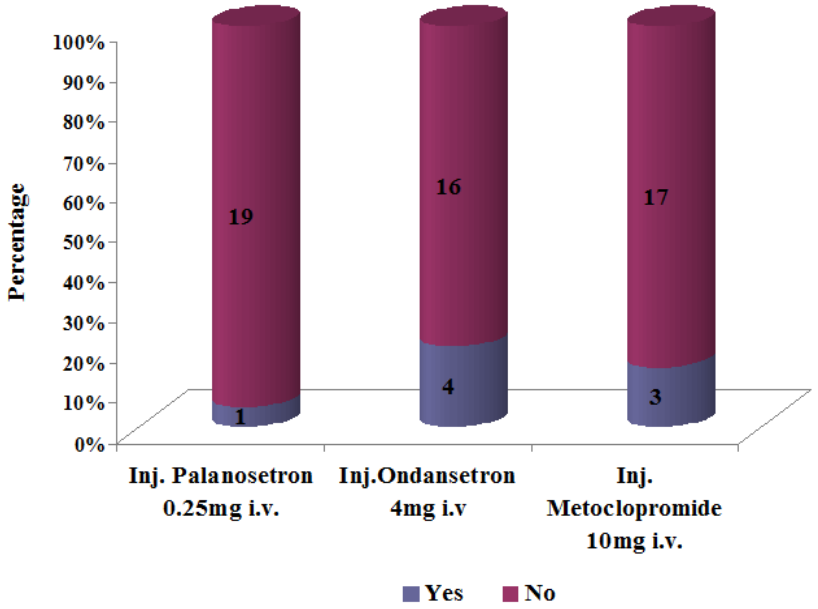
Table 6: Side effects constipation

		Side effects constipation Group			Total
		Inj. Palanosetron 0.25mg i.v.	Inj. Ondansetron 4mg i.v.	Inj. Metoclopramide 10mg i.v.	
	Count	20	20	20	60
	%	100.0%	100.0%	100.0%	100.0%
Total	Count	20	20	20	60
	%	100.0%	100.0%	100.0%	100.0%



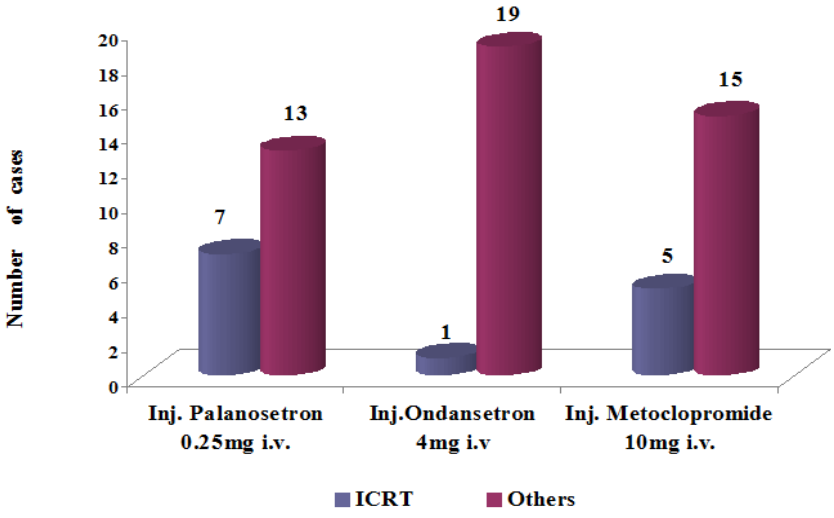
Rescue Anti-Emetics

Rescue anti- emetic dooses were required in 1 out of 20% in Group (P) (5%), 4 out of 20 patients in Group (O) (20%) and 3 out of 20 patients in Group (M) (15%).



Type of Surgery

This study was done in patients undergoing short surgical procedures under short lasting general anaesthesia. The major groups were patients undergoing intra cavitary radio therapy for carcinoma cervix and patients undergoing other gynaecological and orthopedic procedures.



Results

The present study consisted of 60 patients between the age group 18-65yrs belonging to ASA grade I,II and III who were posted for short surgical procedures.

The Patients were Randomly Divided into 3 groups

Group P- Patients who received Palonosetron 0.25mg intravenously (i.v.)

Group O- Patients who received Ondansetron 4mg i.v

Group M- Patients who received Metoclopramide 10mg i.v

From the study,

- Age difference in the three groups showed no statistical significance.
- The incidence of nausea and vomiting was significant in female patients as compared to male

patients.

- Most of the patients studied in the three groups were ASA – 1.
- There was no significant difference in the anti-nausea and anti-emetic efficacy of Palonosetron compared to Ondrasetron and Metoclopramide.
- The incidence of side effects (Headache and Dizziness) was low with Palanosetron compared to Metoclopramide and Ondansetron.
- However the magnitude of effect against PONV appears to be similar to that of other established drugs

Discussion

The result of this study demonstrates that the – Age wise occurrence was found statistically insignificant in association with nausea and vomiting. Sex distribution - the incidence of nausea and vomiting was significant in female patients compared to male patients. In our Prospective study, it was found that among the Side effects – incidence of headache was low in group P compared to group O and group M. Incidence of dizziness was also low in group P than group O and group M. There was no incidence of constipation in any of the groups.

As per previous trails [5,7,8], Single dose of Palonosetron was as effective as Ondansetron in preventing acute CINV and more effective in preventing delayed CINV for adult patients receiving moderately emetogenic chemotherapy. Our study has shown that patients given prophylactic treatment with Palonosetron 0.25mg in adult oncology patients experienced less severe and less frequent nausea and vomiting similar to patients who received Ondansetron or Metoclopramide. Palonosetron improves the control of nausea and vomiting into the second and third days post operatively, an effect that may be most marked after major operations requiring inpatient stay. Palonosetron also reduces the severity of delayed nausea, which may be of particular relevance to the day-surgery population for whom it is difficult to identify those at risk of postdischarge PONV and for whom early return to normal activities is important, a feature not shared by other 5-HT_3 antagonists.

The magnitude of effect against PONV appears to be similar to that of other established drugs following inpatient surgery, and modest against delayed PONV in ambulatory surgical patients, so more evidence is required before a role against postdischarge PONV in the day-care setting can be recommended.

Approval of palonosetron for the prevention of PONV provides another therapeutic intervention in the arsenal against the 'big little problem'. The prolonged half-life and very affinity of palonosetron for the $5HT_3$ receptor the pharmacological basis for a long duration of action that appears to far exceed that of other $5HT_3$ antagonists. Clinical effectiveness into the fifth day after chemotherapy has been demonstrated and after surgery prolonged effectiveness is also of potential value because PONV often presents late or after discharge [9,10,11].

Acknowledgement

I would like to acknowledge my deep sense of gratitude to Dr. Madhusudan Upadya, Professor and Head, Department of Anaesthesiology, K.M.C, Mangalore, for his extremely valuable guidance in planning, conducting and completing this dissertation.

Iam grateful and thankful to Dr. Sumesh T Rao, Associate Professor, Department of Anaesthesiology, K.M.C, Mangalore.for his support, encouragement, supervision and timely suggestions while conducting the study.

My sincere thanks to all staff members of Department of Anaesthesiology, K.M.C Mangalore and also my colleagues for their co operation throughout my study.

My respects to all the patients without whom this study would not have been possible.

I am grateful to my family members for helping through every stage of the dissertation work and for being the pillars of strength in my life.

Above all all it is the blessings of the Almighty and to Him I offer my sincere prayers.

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